American Academy of Pediatrics
DEDICATED TO THE HEALTH OF ALL CHILDREN™

FROM THE AMERICAN ACADEMY OF PEDIATRICS

TECHNICAL REPORT

Contraception for Adolescents

Mary A. Ott, MD, MA, FAAP, Gina S. Sucato, MD, MPH, FAAP, and COMMITTEE ON ADOLESCENCE

KEY WORDS

contraception, adolescent, birth control, intrauterine device, contraceptive implant, oral contraceptive pills, contraceptive injection

ABBREVIATIONS

AAP—American Academy of Pediatrics
ART—antiretroviral therapy
BMD—bone mineral density
CDC—Centers for Disease Control and Prevention
COC—combined oral contraceptive
DMPA—depot medroxyprogesterone acetate
EC—emergency contraception
FDA—US Food and Drug Administration
HIPAA—Health Insurance Portability and Accountability Act
IUD—intrauterine device
LARC—long-acting reversible contraception
POP—progestin-only pill
STI—sexually transmitted infection
VTE—venous thromboembolism

This document is copyrighted and is property of the American Academy of Pediatrics and its Board of Directors. All authors have filed conflict of interest statements with the American Academy of Pediatrics. Any conflicts have been resolved through a process approved by the Board of Directors. The American Academy of Pediatrics has neither solicited nor accepted any commercial involvement in the development of the content of this publication.

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

All technical reports from the American Academy of Pediatrics automatically expire 5 years after publication unless reaffirmed, revised, or retired at or before that time.

www.pediatrics.org/cgi/doi/10.1542/peds.2014-2300

doi:10.1542/peds.2014-2300

PEDIATRICS (ISSN Numbers: Print, 0031-4005; Online, 1098-4275).

Copyright © 2014 by the American Academy of Pediatrics

abstract

FREE

A working knowledge of contraception will assist the pediatrician in both sexual health promotion as well as treatment of common adolescent gynecologic problems. Best practices in adolescent anticipatory guidance and screening include a sexual health history, screening for pregnancy and sexually transmitted infections, counseling, and if indicated, providing access to contraceptives. Pediatricians' long-term relationships with adolescents and families allow them to help promote healthy sexual decision-making, including abstinence and contraceptive use. Additionally, medical indications for contraception, such as acne, dysmenorrhea, and heavy menstrual bleeding, are frequently uncovered during adolescent visits. This technical report provides an evidence base for the accompanying policy statement and addresses key aspects of adolescent contraceptive use, including the following: (1) sexual history taking, confidentiality, and counseling; (2) adolescent data on the use and side effects of newer contraceptive methods; (3) new data on older contraceptive methods; and (4) evidence supporting the use of contraceptives in adolescent patients with complex medical conditions. *Pediatrics* 2014;134:e1257–e1281

INTRODUCTION

Pediatricians play a key role in adolescent sexual health and contraception. Sexual health is an important part of adolescent anticipatory guidance and screening, and pediatricians' long-term relationships with adolescents and families allow them to help promote healthy sexual decision-making, including abstinence and contraceptive use. Additionally, medical indications for contraception, such as acne, dysmenorrhea, and heavy menstrual bleeding, are frequently uncovered during adolescent visits. A working knowledge of contraception will assist the pediatrician in both sexual health promotion as well as treatment of common adolescent gynecologic problems. This technical report provides the pediatrician with updated information on adolescent sexual behavior, guidelines for counseling adolescents, and an update on available methods of contraception. It is a companion to the policy statement "Contraception for Adolescents."[1]

ADOLESCENT SEXUAL BEHAVIOR AND USE OF CONTRACEPTION

Sexual intercourse is common among adolescents. In 2011, 47% of high school students reported ever having had sex, and 34% reported having had sex in the previous 3 months.[2] For the pediatrician, this means that approximately half of their adolescent patients have engaged in sex,

Downloaded from http://publications.aap.org/pediatrics/article-pdf/134/4/e1257/1100677/peds_2014-2300.pdf by Health Sciences Library@Orlando Health, Melanie Capobianco on 18 January 2022

many without adequate protection against pregnancy and sexually transmitted infections (STIs).

Unintended pregnancy is a serious adolescent morbidity, and use of effective contraception is one of the pillars of adolescent pregnancy prevention. Each year, approximately 750 000 adolescent girls become pregnant, and 82% of these pregnancies are unplanned.[3,4] More than half of these pregnancies (59%) end in births, 14% end in miscarriages, and 27% end in abortion.[3] From 1990 to the early 2000s, adolescent pregnancy rates declined markedly, and 86% of this decline was attributable to increased consistent contraceptive use (the remainder was attributed to delay of sexual activity).[5] By 20 years of age, 18% of young women will have given birth, and this number is largely unchanged from 2002.[6]

The contraceptive method most commonly used by adolescents is the condom (96% of young women who have ever used a contraceptive reported previous condom use), followed by withdrawal (57%) (see Table 1). Among hormonal methods, experience with combined oral contraceptives (COCs) is most common (56%), followed by depot medroxyprogesterone acetate (DMPA) injection (20%), the transdermal patch (10%), and the vaginal ring (5%). More than 13% of adolescents have ever used emergency contraception (EC), and 15% have ever used periodic abstinence. However, ever having used a method does not necessarily translate into consistent or current use. When a nationally representative sample of all 15- to 19-year-old adolescent girls were asked about current use (past 3 months), 28% reported any contraceptive use. The pill was most commonly used (15%), followed by condoms (6%), DMPA (3%), and withdrawal, the contraceptive ring, and the intrauterine device (IUD) (all approximately 1%). The transdermal patch was less than 1% (see Table 2). Experience with long-acting reversible contraception (LARC), such as IUDs and implants, has increased markedly in 15- to 19-year-olds over the past decade, with the bulk of the increase in the 18- to 19-year age range. By 2009, it was estimated that 4.5% of contraceptive use was an IUD or implant.[4]

TABLE 1 Lifetime Use (Ever-Use) of Contraception Among Sexually Experienced Women Aged 15 to 19 Years: United States, 2006 to 2010

Method	% Distribution
Any method[188]	98.9
Injectable	20.3
Pill	55.6
Contraceptive patch	10.3
Contraceptive ring	5.2
Emergency contraception	13.7
Condom	95.8
Female condom	1.5
Periodic abstinence—calendar	15.0
Withdrawal	57.3
Other methods	7.1
Long-acting reversible contraceptives (IUDs and implants)[64]	4.5

SETTING THE STAGE: CONFIDENTIALITY, CONSENT, AND THE SEXUAL HISTORY

Sexual history taking and counseling about pregnancy prevention, including contraceptive use, are key Bright Futures objectives for the adolescent visit.[7] The demands of these tasks can be managed by situating them in an adolescent's medical home. Because of pediatricians' ongoing relationships with adolescents and families, they are optimally suited for this role.[7] The following sections outline the evidence base for key elements relevant to contraceptive care, including confidentiality and consent, sexual history taking, and counseling.

Confidentiality and Consent

In the setting of contraception and sexual health care, the American Academy of Pediatrics (AAP) believes that policies supporting adolescent consent and protecting adolescent confidentiality are in the best interests of adolescents. Most states have specific laws regarding minor consent to contraception (see "State Minor Consent Laws: A Summary"[8] and the Guttmacher Institute's State Center[9] for regularly updated state-by-state summaries). For states without specific laws, best-practices guidelines, federal statutes, and federal case law may support minor confidentiality and consent.[10] For example, family-planning clinics funded by Title X of the federal Public Health Services Act (42 USC §§300–300a-6 [1970]) are required to provide confidential services to adolescents.[8]

The Health Insurance Portability and Accountability Act (HIPAA [Pub L No. 104-191, 1996]) specifically addresses minor confidentiality. Although HIPAA allows parents access to adolescents' records as personal representatives of the minor, that access is denied when the minor can consent under state or other laws, or when the parent agrees that the minor may have confidential care.[10] The AAP, therefore, recommends that pediatricians have an office policy that explicitly describes confidential services and that pediatricians discuss (and document) confidentiality with all parents and adolescents. As an additional protection for minors' confidentiality, HIPAA states that if there is no applicable state law about the rights of parents to access the protected health information of their children, pediatricians (or other licensed health professionals) may exercise their professional judgment to provide or deny parental access to the records. This can be accomplished with careful documentation of their professional judgment.

Insurance billing, electronic health record systems, and patient portals create additional challenges to maintaining the

Downloaded from http://publications.aap.org/pediatrics/article-pdf/134/4/e1257/1100677/peds_2014-2300.pdf by Health Sciences Library@Orlando Health, Melanie Capobianco on 18 January 2022

TABLE 2 Current Contraceptive Use by Method of Women Aged 15 to 19 Years: United States, 2006 to 2008[162]

Contraceptive Status and Method	% Distribution
Using contraception	28.2
Pill	15.2
Implant, Lunelle, or patch	0.5
3-mo injectable (Depo-Provera)	2.6
Contraceptive ring	1.0
IUD	1.0
Condom	6.4
Withdrawal	1.1
Not using contraception	71.8
Nonsurgically sterile—female or male	0.5
Pregnant or postpartum	3.9
Seeking pregnancy	0.9
Other nonuse:	
Never had intercourse or no intercourse in 3 mo before interview	60.0
Had intercourse in 3 mo before interview	6.5

confidentiality of visits, visit content, and associated laboratory testing that will need to be considered. The AAP policy statement on electronic health records supports privacy policies consistent with state health care consent laws and best practices around sensitive health topics such as sexual behavior and contraception.[11]

Importance of Confidentiality and Consent

Careful attention to minor consent and confidentiality are important, because confidentiality is a major concern of adolescents[12] and a reason for foregoing contraceptive care. In a nationally representative sample, adolescents most in need of confidential health services (eg, sexually active girls) were more likely to cite confidentiality as a reason for foregoing health care.[13] Confidentiality concerns are heightened among adolescents from underrepresented minority groups[14,15] and other groups at high risk of unintended pregnancy (eg, those involved with the juvenile justice system; lesbian, bisexual, and transgender; and lower-income youth).[16,17] Many adolescents are unaware they can obtain confidential health care,[18] presenting a potential barrier to access to contraceptive services.

Limitations on adolescents' confidentiality and their ability to consent have been associated with lower use of contraceptive services and poor outcomes. Among minors attending family-planning clinics, young women reported that if parental notification were required for prescriptive contraceptives, only 1% would stop having vaginal sex, but 59% would stop using all clinic services.[19] Among young African American women, fear of family finding out about sexual health services was a common reason to delay a first clinic visit for contraception.[20] On a population level, minors' capacity to consent to contraceptives has been associated with lower adolescent birth rates,[21] and restrictions on minors' capacity to consent to contraceptives have been associated with higher birth rates.[22]

Parents

The relationship among parents, confidentiality, and access is complex. Many parents are supportive of minor consent and confidentiality for sexual health services. In a national Internet-based survey, 66% of parents agreed that it was important for adolescents to have private time with physicians, and more than half (54%) of parents did not want doctors to disclose confidential information obtained from adolescents to parents.[23] Many parents are aware that their adolescents use confidential sexual health services. A national study of adolescent family-planning clinic clients revealed that 60% of adolescents reported that their parents were aware of their use of sexual health services.[24] Among adolescents whose parents were aware of their sexual health service use, 79% would continue to use the services, even if parental notification were required; however, among adolescents whose parents were unaware of their sexual health services use, fewer than 30% would continue to use services.[24]

Sexual History Taking and Counseling

Taking a Sexual History

Adolescents consider pediatricians and other health care providers a highly trusted source of sexual health and other confidential information.[25,26] When pediatricians discuss sensitive topics with adolescents, instead of reporting discomfort, adolescents reported that the pediatrician understood their problems, eased their worries, and allowed them to make treatment decisions.[27] Best-practices guidelines require that the sexual history be taken with the adolescent alone.[7] Key to history taking is an honest, caring, nonjudgmental attitude and a comfortable, matter-of-fact approach to asking questions. This can be accomplished by using the "5 Ps" tool of the Centers for Disease Control and Prevention (CDC): partners, prevention of pregnancy, protection from STIs, sexual practices, and past history of STIs and pregnancy (see http://www.cdc.gov/std/treatment/SexualHistory.pdf).[28]

Contraceptive counseling should be developmentally targeted, because the sexual health and contraceptive needs of early adolescents differ markedly from those of middle and late adolescents. Even among same-age adolescents, there is often a wide range in adolescents' sense of themselves as a sexual being, their sexual experiences, and their interest and need for contraception. For example, a study of early adolescents described views and behaviors ranging from considering sex to be "nasty" and something best left to adults, to an intense curiosity about and initiation of sexual behaviors.[29] Bright Futures provides sample questions and guidance for a developmentally tailored sexual history.[7]

Downloaded from http://publications.aap.org/pediatrics/article-pdf/134/4/e1257/1100677/peds_2014-2300.pdf by Health Sciences Library@Orlando Health, Melanie Capobianco on 18 January 2022

Counseling Using Motivational Interviewing

Increasing evidence from studies of adolescents suggests that individual counseling about contraception and sexual health topics is most effective using patient-centered approaches, such as motivational interviewing.[30,31] Motivational interviewing can be used to address the ambivalence and discrepancies among adolescents' sexual and contraceptive behaviors, their sexual and relationship values, and future life goals. Key elements are (1) an empathetic and nonjudgmental interviewer with unconditional positive regard for the adolescent in a safe, nonthreatening environment; (2) engaging adolescents in their own behavior change; (3) asking adolescents about their goals, and helping them identify inconsistencies between their goals and current behavior; (4) "rolling with resistance," or avoiding direct confrontation when resistance is met, and waiting for adolescents to find their own answers rather than pointing them out; and (5) supporting adolescents' capacity to change.[32,33] Motivational interviewing is a natural extension of youth development principles in its focus on goals and future orientation, belief in adolescents' capacity to change, and engagement of adolescents in the process of adopting health-promoting behaviors.[34]

Motivational interviewing is accomplished through open-ended questions and careful listening.[32,33] In the context of pregnancy prevention and sexual health promotion, discussions might explore the adolescent's reasons for becoming sexually active and the effect that sexual intercourse and unintended pregnancy may have on relationships with peers, parents, and significant others.[35] For example, does the adolescent believe that sex will deepen a relationship?[36] Or is sexual behavior or pregnancy considered a marker for adulthood?[37] A motivational interviewing approach to contraceptive counseling might also focus on adolescents' goals (examples of goals linked to sexual decision-making include school completion, college, marriage, and childbearing[37]), and how contraception and the delay of pregnancy might affect those goals.[35] An example of an inconsistency between goals and behaviors might be the adolescent who expresses a desire to graduate from high school and attend college but is frequently engaging in unprotected sex, putting her at risk for an unintended pregnancy.

A common concern of pediatricians is giving complex messages to adolescents: in the case of sexual behavior, the complex message is that a pediatrician would like to encourage abstinence but also is willing and able provide appropriate counseling regarding sexuality and contraception. With motivational interviewing approaches, it is possible and appropriate for pediatricians to provide this type of complex message, because the focus is on the adolescents' values and relationships and related goals and discrepancies between goals and behaviors. Research suggests that adolescents are capable of understanding this type of complex message and, in fact, may disregard messages that they consider judgmental or overly simplified or that eliminate key health information.[25,26] More detailed information on motivational interviewing with adolescents can be found in recent publications.[35,38]

Abstinence Counseling in the Office Setting

Counseling about abstinence is an important component of sexual health care. When used consistently without exception, abstinence can be an effective means of contraception and STI prevention and is a viable strategy in the pediatrician's toolkit for reducing unintended pregnancy and STIs. It has been estimated that approximately one-quarter of the decline in the adolescent pregnancy rates from 1995 to 2002 was attributable to the delayed initiation of sexual activity.[5] Abstinence counseling should follow the motivational interviewing approaches described previously. A set of practical tips for abstinence counseling within an office-based setting has been published, and it uses a comprehensive motivational interviewing perspective.[35]

When adhered to perfectly, sexual abstinence is 100% effective, making it an attractive choice for pregnancy prevention. However, many adolescents who practice abstinence do not adhere to the method 100% of the time (ie, they occasionally have vaginal-penile intercourse). Few data exist on actual effectiveness of abstinence (called "typical use," see explanation in Methods of Contraception)[39]; however, existing data suggest that the effectiveness of abstinence for pregnancy and STI prevention over extended periods of time is likely low. For example, among adolescents reporting virginity pledges in the National Longitudinal Study of Adolescent Health, at 6-year follow-up (wave 3), 88% had engaged in sexual intercourse (most premarital), and 5% were infected with STIs.[40] Because of concerns about a low typical-use effectiveness of abstinence as a contraceptive method, it is critical for pediatricians to reassess intentions to remain abstinent at every visit and additionally to provide access to comprehensive sexual health information, including information about EC and condom use. Comprehensive information, including pregnancy prevention, should be provided to all adolescents, including those who identify as lesbian and gay, because they may have opposite-sex partners as well.[17]

METHODS OF CONTRACEPTION

Numerous reviews and recommendations for prescribing and managing

Downloaded from http://publications.aap.org/pediatrics/article-pdf/134/4/e1257/1100677/peds_2014-2300.pdf by Health Sciences Library@Orlando Health, Melanie Capobianco on 18 January 2022

contraception are available (see, for example, *Contraceptive Technology*[41] and the CDC's "US Selected Prescribing Recommendations for Contraceptive Use"[42]). Additionally, there are online resources for prescribing contraceptives geared toward clinicians (see Table 3). The following section focuses on the appropriateness of various methods available for adolescents.

When comparing the efficacy of different contraceptive methods, it is important to distinguish "perfect use" and "typical use." Perfect-use efficacy refers to the probability of pregnancy if used consistently and correctly every time; data for perfect use come from clinical trials with very high levels of adherence.[43] Typical-use efficacy refers to the probability of pregnancy during the first year of typical use; data for typical-use efficacy come from national surveys that include users with varying degrees of adherence.[43] Thus, the typical-use efficacy rates reflect how well a contraceptive method works with an average user, factoring in mistakes, such as missed pills, forgotten condoms, or patches that are left on too long. Table 4 includes perfect- and typical-use data for all contraceptive methods. The individual methods appropriate for adolescents are addressed hereafter, discussed in order of effectiveness, starting with LARC. It is recommended that pediatricians use a "tiered" approach to contraceptive counseling, starting with the most effective methods.

Progestin Implants

Currently available progestin implant LARC methods include Implanon and Nexplanon (Merck, Whitehouse Station, NJ). Both consist of a single-rod implant that contains etonogestrel, the active metabolite of desogestrel; Nexplanon also contains barium sulfate to render it visible on radiography. The implant, highly effective with a failure rate of less than 1%,[43,44] may remain in place for 3 years. It is inserted into the inside of the nondominant upper arm, 6 to 8 cm above the elbow, by a medical professional who has completed the requisite training. Insertion takes approximately 1 minute, and removal can be accomplished in under 5 minutes.[45] Complications are rare but include transient nerve injury and the need for removal under general anesthesia.[44,46,47]

Implants are ideal for adolescents who prefer a method that does not require regularly scheduled adherence and who desire an extended length of protection. Authors in Brazil have identified it as a viable option for delaying second pregnancy in adolescent mothers.[48] In Australia, a prospective study was conducted of 137 adolescent mothers, 18 years or younger.[49] Participants selected their own method, with half choosing the implant and the remainder choosing COCs, DMPA, a barrier method, or nothing. Both method continuation and time to next pregnancy were significantly longer in implant users. It must be noted, however, that there were key differences between the users of the implant and users of other methods. For example, implant users were significantly more likely to be living with the birth father rather than one of their own parents. In addition, more than half of implant users discontinued their method earlier than 24 months, with the most common reason being abnormal uterine bleeding. This is consistent with observational studies (as opposed to clinical trials, which tend to enroll and retain more adherent contraception users) describing continuation rates and bleeding patterns in adult users.[50,51] In a published summary of 11 clinical trials that included a total of 942 women within 80% to 130% of their ideal body weight, 64% reported amenorrhea or infrequent bleeding over the first 2 years, and 15% reported frequent or prolonged bleeding.[52] This may differ from clinicians' anecdotal experience in part because heavier women may have more bleeding than lighter women.[53] Unlike most other continuous methods, it is not clear that implant users experience improved bleeding patterns over time.[54] Experience in the first 3 months may help predict future bleeding patterns,[53] but individual experience is highly variable. Although bleeding is frequent with all progestin-only methods, it is important to remember that unscheduled bleeding can also be a sign of an STI, and adolescents should be tested accordingly. Data are limited, but experts have recommended the use of nonsteroidal anti-inflammatory drugs and/or COCs

TABLE 3 Online Contraceptive and Sexual Health Resources for Providers

Centers for Disease Control and Prevention	
US Selected Practice Recommendations for Contraceptive Use, 2013	http://www.cdc.gov/mmwr/preview/mmwrhtml/rr6205a1.htm?s_cid=rr6205a1_w
Counseling Resources: Teen Pregnancy Prevention	http://www.cdc.gov/teenpregnancy/healthcareproviders.htm
US Medical Eligibility Criteria for Contraceptive Use, 2010	www.cdc.gov/mmwr/pdf/rr/rr59e0528.pdf
Contraceptive Technology	http://www.contraceptivetechnology.org/reproductive-health-resources/training-videos-slides/
Association of Reproductive Health Professionals Web site	www.arph.org/
Managing Contraception	www.managingcontraception.com/ga
World Health Organization Medical Eligibility for Contraceptive Use	http://whqlibdoc.who.int/publications/2010/9789241563888_eng.pdf
Princeton University Emergency Contraception Web site	ec.princeton.edu/

Downloaded from http://publications.aap.org/pediatrics/article-pdf/134/4/e1257/1100677/peds_2014-2300.pdf by Health Sciences Library@Orlando Health, Melanie Capobianco on 18 January 2022

TABLE 4 Contraceptive Method Efficacy

Method	% of Women Experiencing an Unintended Pregnancy Within the First Year of Use		% of Women Continuing Use at 1 Year[c]
	Typical Use[a]	Perfect Use[b]	
No method	85	85	—
Spermicides (foams, creams, gels, suppositories, and film,)	28	18	42
Fertility awareness-based methods	24	—	47
Withdrawal	22	4	46
Condom			
Female	21	5	41
Male	18	2	43
Diaphragm	12	6	57
Combined pill and progestin-only pill	9	0.3	67
Contraceptive patch	9	0.3	67
Contraceptive ring	9	0.3	67
DMPA injection	6	0.2	56
IUD			
Copper T	0.8	0.6	78
Levonorgestrel	0.2	0.2	80
Single-rod contraceptive implant	0.05	0.05	84
Female sterilization	0.5	0.5	100
Male sterilization	0.15	0.10	100

—, data not available.

Source: Trussell J. Contraceptive failure in the United States. *Contraception.* 2011;83(5):397–404.

[a] Among typical couples who initiate use of a method (not necessarily for the first time), the percentage who experience an unintended pregnancy during the first year if they do not stop use for any other reason. Estimates of the probability of pregnancy during the first year of typical use for spermicides, withdrawal, periodic abstinence, the diaphragm, the male condom, the pill, and Depo-Provera are taken from the 1995 and 2002 National Survey of Family Growth, corrected for underreporting of abortion; see the text for the derivation of estimates for the other methods.

[b] Among couples who initiate use of a method (not necessarily for the first time) and who use it perfectly (both consistently and correctly), the percentage who experience an unintended pregnancy during the first year if they do not stop use for any other reason.

[c] Among couples attempting to avoid pregnancy, the percentage who continue to use a method for 1 year.

as potentially helpful measures to manage implant-related bleeding.[54]

Other than irregular bleeding, adverse effects are not common, but include emotional lability, weight gain, headache, and acne.[52] Data are scant on the effect of the implant on bone mineral density (BMD).[55–57] Given the higher estradiol level in implant users compared with DMPA users,[54] it could be presumed that the implant has less effect on BMD, but this has not been adequately assessed in adolescent women. Similar to the combined hormonal methods, efficacy is impaired by hepatic enzyme-inducing drugs (see Table 5); however, implants are considered safe for women with estrogen contraindications.[58]

For adolescents who need highly effective contraception that is user- and coitus-independent, the implant is an outstanding choice. However, it is critical that the risk of persistent irregular bleeding is well understood; to date, this is the most common complaint resulting in premature removal. For adolescents seeking hormonal methods specifically to manage abnormal uterine bleeding and irregular cycles, a combined method or a levonorgestrel IUD may be more acceptable to the patient.

Intrauterine Contraception

IUDs are inserted into the uterus to provide long-acting reversible contraception. Appropriate for adolescents, IUDs are generally safe, effective methods of contraception with a failure rate of less than 1% (see Table 4).[43] Three IUDs currently are approved for the US market: a copper-containing T-shaped IUD (copper T380-A, ParaGard; Teva North America, North Wales, PA) and 2 levonorgestrel-releasing T-shaped IUDs (52-mg levonorgestrel, Mirena, and 13.5-mg levonorgestrel, Skyla; Bayer HealthCare Pharmaceuticals Inc, Wayne, NJ). The primary mechanism of action of both types of IUD is preventing fertilization by inhibiting sperm motility. The levonorgestrel IUDs also thicken cervical mucus. All mechanisms occur before implantation, when pregnancy begins, and inhibiting implantation is not believed to be a primary mechanism of action for either type of IUD.[59] The 13.5-mg levonorgestrel IUD is approved for 3 years.[60] The 52-mg levonorgestrel IUD is approved for 5 years,[61] although data suggest that it is still effective at least up to 7 years; similarly, the copper T380-A IUD is approved for 10 years,[62] but data support use for 12 years.[63] Although IUDs have very low use in the United States, they are used extensively worldwide, and use is increasing in the United States, particularly among older adolescents.[64]

Previous concerns about adolescents and IUDs have been addressed by more recent data demonstrating that IUDs are safe for nulliparous adolescents. For example, a case-control study demonstrated that past associations between infertility and IUD use among nulliparous women were attributable to STIs rather than IUDs.[65] Other studies support a rapid return to fertility after IUD removal.[66,67] Data also address concerns about pelvic infections. There is a small increase in infection risk around the time of IUD insertion as a result of the procedure. However, beyond the first 20 days after insertion, IUDs do not increase rates of pelvic inflammatory disease (PID) above baseline.[68,69] Screening for gonorrhea and *Chlamydia* can be performed at the same time as insertion.[59] Any necessary treatment can be subsequently provided without IUD removal, as international studies have demonstrated that STIs

Downloaded from http://publications.aap.org/pediatrics/article-pdf/134/4/e1257/1100677/peds_2014-2300.pdf by Health Sciences Library@Orlando Health, Melanie Capobianco on 18 January 2022

TABLE 5 Medications That Decrease COC Efficacy

Antibiotics
Rifampin
Anticonvulsants
Felbamate
Ethosuximide
Primidone
Phenobarbital
Phenytoin (Dilantin)
Carbamazepine
Oxcarbazepine
Lamotrigine[a]
Rufinamide[a]
Topiramate
Antidepressants
St. John's wort[b,c]

Source: World Health Organization. *Medical Eligibility Criteria for Contraceptive Use.* 4th ed. Geneva, Switzerland: World Health Organization; 2009.

[a] Fewer data are available for these newer antiepileptic drugs, but available data suggest they can decrease COC effectiveness.

[b] Advantages of COC use generally outweigh the risks.

[c] Murphy PA, Kern SE, Stanczyk FZ, Westhoff CL. Interaction of St. John's Wort with oral contraceptives: effects on the pharmacokinetics of norethindrone and ethinyl estradiol, ovarian activity and breakthrough bleeding. *Contraception.* 2005;71(6):402-408.

and PID can be treated with the IUD in place,[70] as long as the patient improves with treatment. As a result, there are now more limited infectious contraindications to IUDs. These include current or recent (past 3 months) PID or current gonorrhea, *Chlamydia*, or purulent cervicitis. Additional contraindications include pregnancy and uterine anomalies that distort the uterine cavity in a manner incompatible with IUD insertion (see CDC recommendations for complete list[58]). HIV infection and immunosuppression are not contraindications to IUD use.

The one area with less clarity is that, for insertion of IUDs (but not continuation), "high risk of STIs" is considered by the CDC to be level 2 (benefits generally outweigh risks) or level 3 (risks generally outweigh benefits, but clinician may individualize). However, the data supporting the level 3 categorization are from a study of HIV-infected adult women in Africa.[58] Beyond STI risk, existing concerns about IUD use in adolescents are that rates of expulsions and experiences of pain and discomfort are somewhat higher among nulliparous compared with parous young women. Nonetheless, current data suggest that IUDs are generally well tolerated in young women and that continuation and satisfaction rates are high.[71–74]

Adolescent-specific data are limited on acceptability and use of IUDs for contraception; however, recent studies are promising, suggesting 1-year continuation rates of 75% or greater.[75–78] The data on levonorgestrel IUD use for medical indications in adolescents reveal improvement in dysmenorrhea and heavy menses.[76,79] The levonorgestrel IUD is also useful for adolescents with medical conditions that require long-term menstrual suppression in which estrogen is contraindicated or that present a serious risk to the fetus in the case of unintended pregnancy. For example, use of the levonorgestrel IUD with disabled nonambulatory adolescents allows effective menstrual suppression while avoiding both exogenous estrogen exposure and the bone-density effects of DMPA.[78,80] Levonorgestrel IUDs also provide an important option for adolescent bariatric surgery patients, for whom experts recommend a delay of pregnancy of at least 12 to 18 months after surgery but who often experience a rapid return to fertility after surgery.[81] Barriers to pediatricians inserting IUDs, such as lack of training, lack of office capacity, or not seeing enough patient volume to maintain skills, pose an access problem, which can be overcome by identifying specific providers in the community to whom these patients can be referred.

Progestin Injections

DMPA, also known by the brand name Depo-Provera (Pfizer, New York, NY) is a long-acting progestin that is given as a single injection every 13 weeks (up to 15 weeks) using a dose of either 150 mg delivered intramuscularly or 104 mg delivered subcutaneously; the feasibility of self-administration of the latter is currently under investigation. Both regimens have similar effectiveness and side effects.[82] DMPA can be initiated on the same day as the visit ("mid-cycle" or "quick" start). The CDC states that even if pregnancy cannot be definitively ruled out, the benefits of initiating DMPA exceed the risks and that DMPA can be initiated at any time, with a follow-up pregnancy test in 2 to 4 weeks.[42]

DMPA is highly effective in preventing pregnancy. In the first year of use, the probability of becoming pregnant by typical users is approximately 6% (perfect use is 0.2%; see Table 4).[43] Some experts believe that the use of DMPA, which first became available in the United States in 1992, is one factor responsible for the declining rates of adolescent pregnancy in the United States.[5,83]

DMPA is convenient for many adolescents because of its ease of use compared with coitus-dependent methods or those that require daily, weekly, or monthly adherence. Other advantages, similar to combined hormonal methods, include improvement in dysmenorrhea and protection against irondeficiency anemia and endometrial cancer.[84] DMPA may be safely recommended for adolescents who are lactating[85] and most of those who have chronic illnesses.[58] It may provide additional benefits in some circumstances, for example, by raising the seizure threshold[85] and decreasing sickle cell crises.[87,88] Despite recent work suggesting that DMPA may result in an increased risk of venous thrombosis,[89] for patients at risk for estrogen-related complications, the advantages of DMPA are still believed to outweigh the risks.[58]

The major disadvantages of DMPA for adolescents are menstrual cycle irregularities (present for nearly all patients initially), the need for an

Downloaded from http://publications.aap.org/pediatrics/article-pdf/134/4/e1257/1100677/peds_2014-2300.pdf by Health Sciences Library@Orlando Health, Melanie Capobianco on 18 January 2022

injection every 13 weeks, and potential adverse effects, including weight gain and interference with normal increases in bone density. Other adverse effects include headache, mastalgia, hair loss, and change in libido. Although rare, anaphylaxis to DMPA has been described.[90]

The irregular bleeding associated with DMPA typically improves over time.[91,92] Studies have demonstrated that patients are more likely to continue DMPA use if they are counseled about adverse effects before their first injection, but these studies did not target adolescents specifically.[93,94] Long-term DMPA use is also 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.[95] However, for adolescent patients, such a delay does not usually pose a major deterrent to using this method.

Although a number of observational studies have found an increased risk of weight gain among young women using DMPA,[96–100] a recent Cochrane review[101] evaluated this subject and identified only 2 high-quality and 2 moderate-quality studies, only one of which[102] demonstrated that adolescents using DMPA had increased body fat percentage and decreased lean body mass. This finding, in contrast to widespread clinical observations about significant weight gain with DMPA, could be explained by significant variability in the trajectories of weight gain among women using DMPA. Bonny et al[103] studied 97 adolescents and found that 21% experienced early weight gain, defined as an increase in weight of more than 5% at 6 months. Over 18 months, those early gainers experienced an increase in mean BMI of 7.6 compared with 2.3 for non-early weight gainers. Similar findings in adult patients[104] suggest that weight-gain status at 6 months is a strong predictor of future excessive weight gain with ongoing DMPA use but that weight gain on DMPA is not a uniform finding for all patients.[96,98]

Because DMPA suppresses circulating estradiol concentrations, it causes lack of BMD accrual[105–107] and has an adverse effect on biochemical markers of bone formation and resorption.[108] In response to these concerns, the Food and Drug Administration (FDA) issued a "black-box" warning regarding the risk of decreased BMD among DMPA users in November 2004.[109] The warning recommended using DMPA for longer than 2 years only if other methods are inadequate, noting a lack of certainty regarding peak BMD attained later in life among users of DMPA. Since that time, 3 publications have described prospective studies of adolescent and young adult women during and after use of DMPA.[110–112] All 3 documented substantial recovery of BMD after DMPA use, thus, offering reassurance about the long-term skeletal health of adolescent patients who use DMPA. The American College of Obstetricians and Gynecologists, recognizing the risk of unwanted pregnancy if adolescents' contraceptive options are limited, does not advise limiting DMPA use to 2 years, nor does it recommend monitoring BMD after that time frame.[83] In addition, some experts[113] dispute the limited data that suggest a link between DMPA use and elevated risk of fractures in reproductive-age women[114,115] and have called for removal of the black box warning.

Although recent studies are reassuring about the likelihood of bone recovery after DMPA cessation, 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 more strongly encourage alternatives to DMPA. All patients should be encouraged to include foods and/or supplements to ensure intake of at least 1300 mg calcium each day along with 600 IU vitamin D,[116] to participate in weight-bearing exercise regularly, and to stop smoking as important measures to promote skeletal health. Clinicians must remind patients that, as with all hormonal methods of contraception, condoms should be used in conjunction with DMPA for protection from STIs.

Combined Oral Contraceptive Pills

COCs have been available for more than 50 years. They 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 hormonal contraception among adolescents (see Tables 1 and 2). They are the prototype for other combined methods of birth control, including the vaginal ring and transdermal patch (discussed later), which have similar effectiveness, contraindications, medical benefits, and side-effect profiles.

COC Prescribing

COCs all contain an estrogen and a progestin. In almost every pill, the estrogen component is ethinyl estradiol, in amounts varying from 10 to 50 μg, with "low-dose" pills (35 μg or less) being first-line options for adolescents. An internal pelvic examination is not needed before initiation of this method nor any other method except an IUD. However, routine screening for STIs is recommended in all sexually active patients. (For a more complete discussion of gynecologic examinations of adolescents in the pediatric office

Downloaded from http://publications.aap.org/pediatrics/article-pdf/134/4/e1257/1100677/peds_2014-2300.pdf by Health Sciences Library@Orlando Health, Melanie Capobianco on 18 January 2022

setting, see the 2010 AAP clinical report on the subject.[117]) COCs can be started on the same day as the visit ("quick start"), or on the day following EC use (see section on EC) in healthy, nonpregnant adolescents. Patients should be counseled that a back-up method (ie, condoms or abstinence) should be used for at least the first 7 days for contraceptive efficacy, and a condom should be used at all times for protection against STIs. A routine follow-up visit 1 to 3 months after initiating COCs is useful for addressing persistent adverse effects or adherence issues.

There is no 1 pill formulation that is the best choice for every adolescent, and even within the "low-dose" range, changing the amount of estrogen or the type of progestin may be necessary to address adverse effects or optimize medical benefits. Patients also should be informed of common transient adverse effects, including irregular bleeding, headache, and nausea. Neither weight gain nor mood changes have been reliably linked to use of combined hormonal contraception.[118–120] Recommendations for managing adverse effects have been published elsewhere[121] or can be found online (http://www.managingcontraception.com/qa/index.php). COCs have few contraindications in healthy female adolescents. They should not be prescribed for patients with severe and uncontrolled hypertension (systolic pressure ≥160 mm Hg or diastolic pressure ≥100 mm Hg); ongoing hepatic dysfunction; complicated valvular heart disease; migraines with aura or focal neurologic symptoms; complications of diabetes (ie, nephropathy, retinopathy, neuropathy, or other vascular disease); complicated solid organ transplantation; or thromboembolism or thrombophilia (eg, factor V Leiden mutation; antiphospholipid antibody syndrome; or protein C, protein S, or antithrombin 3 deficiency).[111] An excellent and up-to-date resource for prescribing hormonal contraceptives, the "US Medical Eligibility Criteria for Contraceptive Use," is available on the CDC Web site (http://www.cdc.gov/reproductivehealth/UnintendedPregnancy/USMEC.htm) and in print.[58] These recommendations weigh the risks and benefits of contraceptive methods against unwanted pregnancy. When hormonal methods are used for medical therapy, the risk/benefit ratio may differ, and treatment decisions should be considered on a case-by-case basis. Other useful resources include a 2004 detailed discussion of contraceptive choices for patients with congenital heart disease[122] and a recent publication offering expert guidance on prescribing contraception to adolescents at increased risk of hypercoagulability.[123] The most serious adverse event associated with COC use is the increased risk of blood clot, which is discussed in further detail in the following paragraphs.[124] Although smoking should be discouraged, it is not a contraindication to COC use in teenagers and young adults.[58]

New data have continued to emerge regarding the risks and benefits of different progestins. On April 10, 2012, the FDA posted a drug safety communication that resulted in revised drug labels for COCs containing the progestin drospirenone.[125] These note that epidemiologic studies reported as high as a threefold increase in the risk of blood clots for drospirenone-containing products when compared with products containing levonorgestrel or some other progestins, whereas other epidemiologic studies found no additional risk of blood clots with drospirenone-containing products.

However, it is important to remember that most of the risk of blood clot is conferred from the estrogen component of the pill and that all COCs confer a lower risk of blood clot than pregnancy.[126] The baseline incidence of venous thromboembolism in adolescents is up to 1 per 10 000 woman-years per year.[127] Currently available COCs increase the risk of blood clot three- to fourfold, or up to 4 per 10 000[123,124] woman-years. In comparison, the incidence of venous thromboembolism (VTE) associated with pregnancy and the postpartum period is 10 to 20 per 10 000 woman-years, of which 1% to 2% are fatal.[128,129]

COCs decrease the effectiveness of some medications (eg, lamotrigine). Conversely, other medications, such as anticonvulsants and antiretroviral agents, decrease COC effectiveness to the extent patients may need to choose alternative methods[130] (see Table 5 and Special Populations). With regard to antibiotics, neither a 2001 review of the literature[131] nor a 2011 case-crossover study of 1330 COC failures[132] found any definitive evidence of decreased COC effectiveness with the use of any antibiotic except rifampin.

Used perfectly, COCs are extremely effective, with a perfect-use failure rate for all users of 0.3%; however, the typical-use failure rate is 9%, suggesting that adherence is a key issue in COC use (see Table 4).[43] Counseling should include strategies to promote adherence, such as cell phone alarms and support from a family member or partner. Patients should be instructed on what to do if pills are missed. A missed pill should be taken as soon as it is remembered. If more than 1 pill in a row is missed, only the most recently missed pill should be taken as soon as possible, and the remaining pills should be taken at the usual time, reminding patients that 7 consecutive hormone pills are required to prevent ovulation. Further instructions can be accessed online at http://www.cdc.gov/mmwr/preview/mmwrhtml/rr6205a1.htm?s_cid=rr6205a1_w#Fig2.[42] Patients should also be advised that EC

Downloaded from http://publications.aap.org/pediatrics/article-pdf/134/4/e1257/1100677/peds_2014-2300.pdf by Health Sciences Library@Orlando Health, Melanie Capobianco on 18 January 2022

may be needed if 2 or more pills are missed in the first week or if 1 or more pills were missed earlier in the same cycle or late in the previous cycle (see online instructions and Fig 1 for details).

COC Regimens

COCs are currently available in fixed-dose, monophasic regimens (each tablet contains the same dose of estrogen and progestin) or in phasic regimens (triphasic and biphasic packs that contain varying doses of estrogen and progestin). Standard pill packs include 28 pills total, with 21 to 24 hormone pills and 4 to 7 placebo (hormone-free) pills. Among low-dose pills, there are no clear data suggesting one formulation is superior to another for adolescent use, so it is appropriate to choose one with the lowest copay on a patient's insurance formulary (if applicable). Many experts recommend starting adolescents on a monophasic pill with monthly bleeding and then changing regimens and/or extending cycles, as indicated, to address patient adverse effects or preference.[121] Many adolescent medicine providers begin with a COC containing 30 to 35 μg of ethinyl estradiol and a progestin, such as levonorgestrel or norgestimate.

The benefits of decreasing or eliminating the placebo hormone-free interval (see section on COC benefits) have been increasingly recognized, and there are several regimens packaged with more than 21 active pills and fewer placebo pills. For example, some regimens (eg, Yaz [Bayer, Leverkusen, Germany], and Generess FE [Watson, Parsippany, NJ]) have 24 active pills and 4 pills without hormones. Several brands are available with 84 active pills and 7 placebos, or 84 active pills and 7 pills of low-dose estrogen (eg, Seasonique and LoSeasonique; Teva, Petah Tikva, Israel). In 2007, the FDA approved the first COC packaged with a year of continuous combined hormone pills, Lybrel (Pfizer, New York, NY).

COC Benefits

The noncontraceptive benefits of COC use include decreased menstrual cramping and blood loss and improvement in acne. Extended or continuous cycles may be particularly appropriate for adolescents with medical conditions, such as anemia, severe dysmenorrhea, endometriosis, abnormal uterine bleeding, and Von Willebrand and other bleeding diatheses and for adolescents who prefer amenorrhea.[133] These regimens may also be useful for conditions that are known to be exacerbated cyclically, such as migraine (without aura), epilepsy, irritable bowel syndrome, some psychiatric symptoms,[134] and behavioral problems (such as increased aggression or self-mutilation) that sometimes worsen cyclically in young women with profound cognitive impairment.[135] The most common adverse effect of extended-cycle regimens is unscheduled bleeding. Eliminating the hormone-free interval will also minimize fluctuations in medications that interact with COCs (see section on Special Populations). In addition, ovarian suppression is optimized by COC regimens with shorter or no placebo (hormone-free) intervals, potentially increasing contraceptive effectiveness, especially among adolescents who frequently miss pills.[136–138]

Families can be reassured that COC use has not been shown to increase the risk of breast cancer.[139] Also, use of COCs for more than 3 years provides significant protection against endometrial and ovarian cancers.[140] Overall, COCs are one of the best-studied medications ever prescribed. Completely reversible and with no negative effect on long-term fertility, COCs are a safe option throughout a woman's reproductive years.

Contraceptive Vaginal Ring

The vaginal ring (NuvaRing; Merck) releases 15 μg ethinyl estradiol and 120 μg etonogestrel (the active metabolite of desogestrel) daily. It is a round, flexible device that measures 54 mm in outer diameter and 4 mm cross-sectionally. This soft silicone vaginal ring releases both estrogen and progestin hormones that protect against pregnancy for 1 month. 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. Patients should be instructed to insert a new ring after 7 days even if bleeding has not ceased.

Because adolescents may be unfamiliar with their own reproductive anatomy, a pelvic model[141] or other visual aid may be useful in explaining to patients where the ring will be. Patients should be reassured that the ring will not fall out. Eighty women (~90% of them nulliparous) were examined with the ring in place and none were able to expel the ring by bearing down in a Valsalva maneuver.[142] The ring typically sits with the superior-most portion of the ring lying posterior to the cervix.[143]

Most patients will not have previous experience with intravaginal medication and may have questions about its use, such as whether tampons can be worn when the ring is in place. On the basis of evaluation of serum concentrations of ethinyl estradiol and etonogestrel, contraceptive efficacy should not be compromised by concomitant use of tampons,[144] the spermicide nonoxynol-9,[145] or intravaginal miconazole.[146] Similarly, the ring is intended to stay in place during coitus but can be removed for up to 3 hours if desired. This is not typically recommended, and sexually active patients may be reassured to know that most men were not bothered by its presence, if it was noted at all.[142,147]

The ring has comparable typical-use failure rate (9%), risks, and benefits as other combined hormonal methods[43] but provides the simplest regimen.[148,149] As with COCs, a same-day

Downloaded from http://publications.aap.org/pediatrics/article-pdf/134/4/e1257/1100677/peds_2014-2300.pdf by Health Sciences Library@Orlando Health, Melanie Capobianco on 18 January 2022

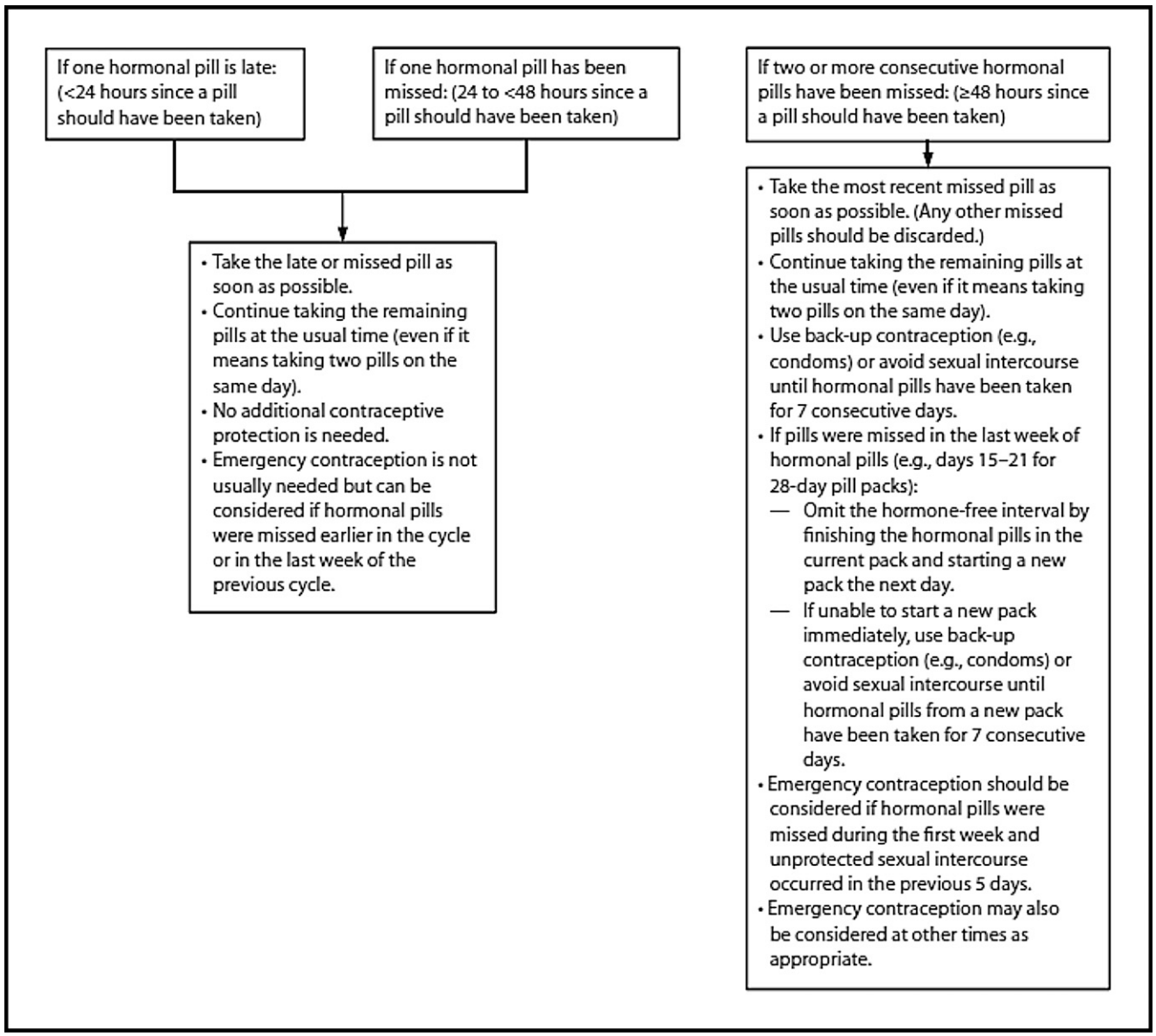

FIGURE 1
Instructions for late and missed combined oral contraceptive pills.

start can be used with the vaginal ring. Adverse effects are largely similar to other combined methods, including breast tenderness, headaches, nausea, and breakthrough bleeding or spotting, with the additional vaginal symptoms of discharge, discomfort, and problems related to the device (eg, expulsion).[150] The limited investigation of bone health with the ring points to its bone neutrality, but these studies have not included adolescents younger than 18 years.[151,152] Studies to date have yielded inconsistent results about how the risk of VTE with use of the ring compares with the risk with use of low-dose COCs.[153–156]

Analogous to experience with the contraceptive patch, it has not been clearly demonstrated that the simplified regimen afforded by the ring results in improved medication adherence or continuation in young people.[157] A trial of 237 college students randomized to use either the ring or COC found that perfect use was greater for the ring in the first 2 months but that this was no longer statistically significant in the third month of the study. Similarly, 6-month continuation rates were no different and were less than 30% for both groups.[158]

The ring is an excellent method for extended use. The vaginal ring package insert states that 1 ring can be used for up to 28 days with no back-up method; however, the rings contain sufficient medication to be used for up to 35 days[159] and, thus, can be replaced

Downloaded from http://publications.aap.org/pediatrics/article-pdf/134/4/e1257/1100677/peds_2014-2300.pdf by Health Sciences Library@Orlando Health, Melanie Capobianco on 18 January 2022

once every calendar month. This eliminates the need for additional refills potentially not covered by insurers, which sometimes poses barriers to continuous pill and patch regimens. As with COCs, the longer the duration of continuous hormones, the greater the number of unscheduled bleeding days; however, the difference between a 28-day and 49-day cycle is small.[160] Similar to COCs, the decision about how often to allow uterine bleeding to occur can be individualized to the adolescent's medical needs and preferences. Women who choose to use the ring continuously with no planned ring-free days can be advised to remove the ring for 4 days if they have more than 5 days of consecutive bleeding, as this has been found to result in fewer bleeding days overall.[161]

Transdermal Contraceptive Patch

The combination hormone transdermal contraceptive patch (Ortho Evra [Ortho-McNeil Pharmaceutical, Raritan, NJ]) contains 0.6 mg norelgestromin and 0.75 mg ethinyl estradiol and measures approximately 1.75 × 1.75 in. The patch can be placed on the abdomen, upper torso, upper outer arm, or buttocks, 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. Current estimates of failure rates for typical use are 9% (<1% for perfect use).[43] Approved by the FDA in November 2001, patch use rose in popularity until 2005, when use declined[162] after publicity about increased estrogen exposure from the patch, which has been found to be 1.6 times higher than estrogen exposure with a COC.[153] The patch has undergone multiple label revisions, most recently August 22, 2012. The 2012 package insert contains a black box warning citing 5 US studies[163–170] (1 with statistically significant findings) that suggest a possible increased risk of VTE compared with a 20- to 35-μg COC, with odds ratios of 1.2 to 2.2. Although these potential health risks are concerning to some adolescents, the patch remains an important contraceptive alternative that may be the best option for some adolescents, especially in comparison with the many adverse consequences of unplanned pregnancy, which include an increased risk of VTE. Nonetheless, other methods may be safer first-line choices for patients interested in extended cycling.

The patch has comparable efficacy, benefits, and drug interactions as other combined methods, but provides a simpler regimen. Thus, it was initially assumed that the patch would promote improved contraceptive adherence in adolescents. Accordingly, early studies demonstrated better adherence to the patch than to COCs among adults,[171,172] most notably among 18- and 19-year-olds,[173,174] and 2 smaller studies of adolescents had high rates of self-reported short-term perfect patch use, 87% and 93%.[175,176] However, contraceptive effectiveness requires that the method be sufficiently well accepted to be continued over time.

To our knowledge, there are no studies that have randomized adolescents to use either the patch or pills, and the observational studies that have compared these methods are plagued by possible selection bias; adolescents who choose a nondaily method may have behavioral characteristics that would interfere with continuation and perfect use of any method.[177–179] For example, Bakhru and Stanwood[177] prospectively followed 1230 women (416 of whom were 17 years or younger) who self-selected their method and found 57% continuation of the patch at 1 year compared with 76% continuation of the pill ($P = .004$). In contrast to their initial hypothesis, patch users were significantly less likely than pill users to continue their method and, thus, were more likely to experience pregnancy.[177] Even lower rates of patch continuation, ranging from 25% to 50%, have been found in other longitudinal studies of adolescent patch users.[179–181]

In addition, similar findings have been shown in randomized studies of adults. A 2010 Cochrane review[182] (based on 4 such studies) concluded that patch users were more likely than pill users to discontinue study participation because of adverse effects. Similarly, in a study that randomized 500 women (average age, 25–26 years) to either the patch or the contraceptive vaginal ring, only 27% of patch users (versus 71% of ring users) planned to continue their assigned method after the 3-month study concluded.[183]

Side effects of the patch are largely similar to other combined methods, with the addition of local adverse effects, such as dislodged patches and hyperpigmentation,[175,176] contact dermatitis and other skin irritation,[184] and concerns about the visibility and appearance of the patch.[185,186] Investigations into the patch's effect on bone health have yielded inconsistent results, with findings in adults[150,151] more reassuring than those in adolescents.[187] However, this limited work is far from conclusive.

Progestin-Only Pills

Progestin-only pills (POPs, also known as "mini-pills") work primarily by thickening cervical mucus, not by inhibiting ovulation. Because of the timing of this effect, it is generally recommended that pills be taken between 4 and 22 hours before coitus usually takes place. Perfect and typical-use failure rates for POPs are not calculated separately from those of combined hormonal contraceptives. Given the importance of even small variations in the timing of pill administration and the continued potential for ovulation, POPs are generally held to be less effective than combined hormonal methods.

Downloaded from http://publications.aap.org/pediatrics/article-pdf/134/4/e1257/1100677/peds_2014-2300.pdf by Health Sciences Library@Orlando Health, Melanie Capobianco on 18 January 2022

Similar to other progestin-only methods, irregular bleeding is a common adverse effect. However, POPs are markedly less effective than other progestin-only methods, including the progestin-containing IUD, the progestin implant, and injectable progestin. Therefore, POPs are not typically recommended as a first-choice contraceptive in healthy adolescents. Nonetheless, they provide a progestin-only alternative for selected adolescent patients with demonstrated excellent medication adherence.

Male Condoms

The male condom is a mechanical barrier method of contraception and STI prevention. In a recent nationally representative survey, condom use was reported at first intercourse by 68% of adolescent girls and 80% of adolescent boys and at most recent intercourse by 52% of adolescent girls and 75% of adolescent boys.[188] Male condoms have several advantages for adolescents, including involving males in the responsibility of contraception, easy accessibility and availability to minors, use without a prescription, and low-cost STI protection.

Male condoms are most commonly made of latex. Lubricated condoms are used for vaginal and anal intercourse; unlubricated condoms are available for oral sex. Although many individuals will need additional lubrication with condoms, adolescents' lubricant use is rarely assessed. Condoms should be used only with water-based lubricants (eg, K-Y Jelly [McNeil PPC Inc, Fort Washington, PA], Astroglide [Biofilm Inc, Vista, CA]), because oil-based lubricants (eg, petroleum jelly, massage oils, body lotions) can weaken latex and cause breakage. Male condoms also are available as polyurethrane (synthetic) for people with latex sensitivities and as natural membrane (eg, lamb cecum). Polyurethrane condoms have similar effectiveness to latex condoms but are more resistant to deterioration and are compatible with both oil- and water-based lubricants. Natural membrane condoms are porous and provide inadequate STI protection.

Condom effectiveness depends on consistent and correct use (see Table 6).[189] For pregnancy prevention, the failure rate at the end of first-year use for the male latex condom is 2% with perfect use and 18% with typical use.[43,190] Consistent evidence supports condoms as reducing the risk of disease transmitted to and from the penile urethra, including gonorrhea, *Chlamydia*, trichomoniasis, hepatitis B, and HIV.[191–195] Emerging evidence also supports condoms as reducing the risk of acquiring diseases transmitted through skin or mucosal contact, including genital herpes simplex virus,[196,197] human papillomavirus,[198,199] and syphilis.[200] Because condoms protect against STIs, all sexually active adolescents should be encouraged to use condoms, regardless of whether an additional contraceptive method is used. Instructions for condom use can be found in Table 6. Additional details on condoms and recommendations can be found in the AAP policy statement on condom use by adolescents.[201] Despite increases in condom use, many adolescents do not use condoms effectively or at all. Condom use is influenced by individual, relationship, and broader social and structural factors,[202–204] which should be addressed on multiple levels, including provider counseling, sex education, and interventions to improve access. Because condom use requires cooperation and communication between partners, condom use within relationships changes as relationships evolve[205] and commonly declines in established relationships.[206,207]

Emergency Contraception

In the United States, the available methods of EC include orally administered hormones, either in a progestin-only dedicated EC product (levonorgestrel, 1.5 mg) or in high-dose combined estrogen and progestin oral contraceptive pills (the Yuzpe regimen); ulipristal acetate (a progesterone receptor modulator); and insertion of a copper IUD. These methods can prevent pregnancy when initiated up to 5 days after an act of underprotected sexual intercourse but are more effective the sooner they are used. Data suggest that ulipristal acetate, approved by the FDA in 2010, may have increased effectiveness over oral levonorgestrel at the end of the 5-day window of use and in heavier women.[208–210] On the basis of data demonstrating that the levonorgestrel EC pill loses effectiveness in women who weigh more than 165 pounds and is ineffective in women who weigh more than 176 pounds, the levonorgestrel EC pill is undergoing revised labeling in Europe, and the FDA is considering whether to require similar revisions in the United States.[211]

Unlike ulipristal, which is pregnancy category X, levonorgestrel does not have teratogenic or other adverse effects on the fetus,[212] and a pregnancy test is not necessary before prescribing levonorgestrel EC.[213] Levonorgestrel EC is estimated to be up to 85% effective.[213,214] Additional details on prescribing EC can be found in the AAP policy statement on emergency contraception,[213] and additional guidance can be found at http://ec.princeton.edu/questions/dose.html#dose.

Plan B One-Step (Teva Pharmaceuticals, Petah Tikva, Israel), a dedicated progestin-only method, is approved by the FDA as a nonprescription product for all women of childbearing potential. Generic versions are approved as nonprescription for women 17 years of age and older; however, proof of age is not required to purchase them.

Given the barriers to EC access and the importance of timely use, advance prescription for EC should be a part of routine adolescent care.[213] There are

Downloaded from http://publications.aap.org/pediatrics/article-pdf/134/4/e1257/1100677/peds_2014-2300.pdf by Health Sciences Library@Orlando Health, Melanie Capobianco on 18 January 2022

TABLE 6 How to Use a Condom Effectively

Before: Store condoms in a cool, dry place. Heat, including body heat from a pocket, can cause latex to degrade over time. Check the expiration date before use.

1. Use a new condom for every act of vaginal, anal, and oral sex throughout the entire sex act (from start to finish).
2. Before any genital contact, put the condom on the tip of the erect penis with the rolled side out.
3. If the condom does not have a reservoir tip, pinch the tip enough to leave a half-inch space for semen to collect. Holding the tip, unroll the condom all the way to the base of the erect penis.
4. After ejaculation and before the penis gets soft, grip the rim of the condom and carefully withdraw. Then gently pull the condom off the penis, making sure that semen does not spill out.
5. Wrap the condom in a tissue and throw it in the trash where others will not handle it.
6. If you feel the condom break at any point during sexual activity, stop immediately, withdraw, remove the broken condom, and put on a new condom.
7. Ensure that adequate lubrication is used during vaginal and anal sex, which might require water-based lubricants. Oil-based lubricants (eg, petroleum jelly, shortening, mineral oil, massage oils, body lotions, and cooking oil) should not be used, because they can weaken latex, causing breakage.

no medical contraindications to this method, and multiple studies have found that providing EC in advance increases the likelihood of women using it when it is needed and does not increase sexual or contraceptive risk-taking behavior.[215,216] Given the sometimes sporadic and unplanned nature of adolescent sexual behavior, counseling and advance provision of EC should be a part of anticipatory guidance.

Other Barrier Methods

Female Condoms

The female condom is a polyurethrane or synthetic nitrile pouch with 2 flexible rings, one fitting inside the vagina and the other on the perineum. Female condoms have a perfect-use failure rate of 5% and a typical-use failure rate of 21%.[43] Among US adolescents and young adults, the female condom has had very low uptake,[217] in part because of higher cost, less availability, lack of knowledge, and negative attitudes toward female condoms.

Vaginal Spermicides

Vaginal spermicides are a chemical barrier method (most commonly nonoxynol-9) 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. Table 4 describes typical- and perfect-use failure rates for vaginal spermicides. The CDC identifies being at high risk for HIV (eg, commercial sex workers) and HIV infection as contraindications for use of spermicides, as use can disrupt the cervical mucosa, potentially increasing risk of HIV acquisition or increased viral shedding and transmission of HIV.[58,218]

Diaphragm, Cervical Cap, and Contraceptive Sponge

The diaphragm, cervical cap, and sponge are barrier methods of contraception. They are less commonly recommended for adolescents, because they do not provide STI protection and have lower effectiveness rates than other methods.[43] Diaphragms are flexible latex cups used with spermicide 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. Sponges are polyurethane sponges that contain nonoxynol-9 spermicide. They are approximately 2 inches in diameter, can be inserted up to 24 hours in advance, and must be left in place for 6 hours after intercourse. Sponges are available over the counter. Diaphragms and caps require fitting by a health care professional. Table 4 provides typical- and perfect-use failure rates for the diaphragm, cervical cap, and contraceptive sponge. For the sponge, typical- and perfect-use failure rates are as much as 16% and 11%, respectively.[219] These methods are contraindicated in women at high risk of HIV or women with HIV infection, because the concomitant spermicide use may increase risk of HIV acquisition or transmission.[58] Detailed information can be found in *Contraceptive Technology*.[41]

Fertility Awareness and Other Periodic Abstinence Methods

Periodic abstinence methods identify fertile days within each menstrual cycle, and the individual abstains during those fertile times. Fertile days can be determined using a menstrual calendar, basal body temperature, and cervical mucus consistency. In a recent national survey, 17% of adolescents report ever using periodic abstinence.[6] Among both adults and adolescents, as many as 24% of individuals reporting periodic abstinence as their primary method of contraception will experience an unintended pregnancy within the first year of use. More concerning is the poor continuation rates for the method,[220] even for individuals participating in clinical trials.[221] An additional challenge with adolescents is that ovulation may not be predictable in the first few year (s) after menarche. If periodic abstinence is used, counseling on dual use of a condom and more reliable alternative methods should be offered. More detailed information can be found in *Contraceptive Technology*.[41]

Withdrawal

Withdrawal, or coitus interruptus, is a method in which the male partner attempts to "pull out" his penis before ejaculation. Although typically considered a "nonmethod," withdrawal is commonly practiced by both adults

Downloaded from http://publications.aap.org/pediatrics/article-pdf/134/4/e1257/1100677/peds_2014-2300.pdf by Health Sciences Library@Orlando Health, Melanie Capobianco on 18 January 2022

and adolescents. In the National Survey of Family Growth 2006 to 2008, 8% to 11% of respondents reported using withdrawal at first sex,[6] and in the 2006 to 2010 survey, 57% of adolescents reported ever using withdrawal as a contraceptive method.[188] Adolescents' reasons for using withdrawal include dissatisfaction with hormonal methods, and as a secondary or backup method to condoms or hormonal contraception.[222] Relationship development and the establishment of trust also were cited as reasons for use of withdrawal.[222] The typical-use failure rate of withdrawal across all age groups is 22%[43]; however, unlike condoms, it provides no STI protection. Because of the common use of withdrawal, pediatricians should remember to ask about it; because of the limited effectiveness[43] and lack of STI protection afforded by withdrawal, pediatricians should encourage adolescents to adopt more effective hormonal and/or barrier methods.

SPECIAL POPULATIONS

Pediatricians care for adolescents with a range of medical conditions that can affect sexuality, sexual behavior, and contraceptive needs. The CDC has recently addressed the contraceptive needs of young women with medical conditions in its publication "US Medical Eligibility Criteria for Contraceptive Use."[58] Available online, this document summarizes the literature on safety and efficacy of different contraceptive methods by medical condition. Populations of particular importance to pediatricians are summarized as follows.

Adolescents With Disabilities

An estimated 16% to 25% of adolescents are identified as having special health care needs, including physical disability, developmental disability, and chronic illness.[223] Sexuality and sexual health care needs in this population are often overlooked, yet data reveal that adolescents with disabilities and chronic illnesses have similar levels of sexual behaviors and sexual health outcomes (eg, STIs).[224,225] Adolescents with disabilities and chronic illnesses also have similar needs for counseling and support of healthy sexuality development.[226,227] These data underscore the need for pediatricians to address sexuality and contraception as part of routine care and as a core function of a medical home, particularly for adolescents using teratogenic medications.

Adolescents with more severe physical disabilities or cognitive impairment may need hormonal contraceptives for menstrual control and hygiene. Adolescents with disabilities may have early or irregular menstrual cycles,[228] and medications such as certain anticonvulsants and antipsychotics may influence the neuroendocrine system, leading to abnormal bleeding.[229] Menstrual hygiene also may present a special problem for adolescents with motility and transfer difficulties, as well as for those with behavioral and developmental disabilities.[230] Menstrual control and suppression is commonly achieved with COCs, transdermal patches, DMPA, and levonorgestrel IUDs.[77,231,232] Continuous or extended cycles of COCs is a common approach,[231,232] and there are reports of successful use of 52-mg levonorgestrel IUDs in adolescent patients.[76,77,80] Surgical approaches (tubal ligation, endometrial ablation, or hysterectomy) are rarely necessary and present special ethical and legal issues. A detailed discussion of menstrual management for adolescents with disabilities can be found in recent review articles as well as professional consensus statements.[231–233]

Adolescents With Obesity

Similar to adolescents with disabilities, sexuality and sexual health are often overlooked among adolescents with obesity. Although national data demonstrate some weight and BMI-related variation in body image and sexual behaviors, the sexual behaviors and sexual health needs of adolescents with obesity are substantially similar to those of their normal-weight peers.[234,235] Obesity and related endocrine effects may influence the efficacy and adverse effect profiles of contraceptives, including EC (see previous section on EC). Excess pregnancies were found among transdermal contraceptive patch users weighing more than 90 kg (198 lb; 0.9% vs 0.3% among "perfect" users).[236,237] Data are limited and inconsistent about whether hormonal contraceptive effectiveness varies by body weight or BMI.[58] Systematic reviews and large cohort studies have revealed no or mixed effects for the effect of both body weight and BMI on COCs, IUDs, implants, and contraceptive injections.[238–240] When examining complications, the World Health Organization and CDC found that among adult women, COC users with obesity are more likely than nonusers to experience thromboembolic complications.[111] However, the absolute risk of thromboembolic complications among adolescent COC users is low.

Women with obesity, either with or without polycystic ovary syndrome, are often anovulatory and experience infrequent menses. Metformin is frequently used in the treatment of these women and can increase the frequency of ovulation, increasing their contraceptive needs. A frequent concern by both adolescents and providers is additional weight gain with hormonal contraceptive use among adolescents with obesity. Adult data suggest that women with obesity are not more likely to have significant weight gain with combined or progestin-only contraceptives.[241–243] In contrast, adolescents with obesity who used DMPA were more likely than normal-weight nonusers,

Downloaded from http://publications.aap.org/pediatrics/article-pdf/134/4/e1257/1100677/peds_2014-2300.pdf by Health Sciences Library@Orlando Health, Melanie Capobianco on 18 January 2022

COC users with obesity, and normal-weight DMPA users to gain weight.[96]

Increasing numbers of adolescents are having bariatric surgery performed, and these patients present special contraceptive needs. Presurgery data reveal a high prevalence of menstrual problems among adolescents with morbid obesity.[81] Postsurgery data demonstrate an improvement in fertility, and professional consensus statements recommend delaying pregnancy for at least 12 to 18 months after bariatric surgery.[244] Together, these suggest a need for highly effective contraceptives in such patients. The surgical procedures themselves may influence effectiveness of contraceptives. Postoperative complications, such as long-term diarrhea and/or vomiting, have the potential to decrease COC effectiveness.[58] Additionally, surgical procedures involving a malabsorptive component have the potential to decrease COC effectiveness.[58] Similar concerns about decreased COC effectiveness have not been described with laparoscopic placement of an adjustable gastric band. Given the challenges with oral, transdermal, and injectable contraceptives and the need for effective long-term postprocedure contraceptives, there is increasing use and success with levonorgestrel IUDs placed at the time of surgery.[81]

Adolescents With HIV

The vast majority of adolescents with HIV acquire their infection during adolescence through sex, intravenous drug use, or other behavioral mechanisms. Only a small proportion of adolescents with HIV are infected perinatally. National data reveal that sexual behaviors of HIV-infected adolescents do not differ substantially from their uninfected peers, and therefore, these adolescents have similar contraceptive and sexual health needs. However, because of risks of transmission to partners and because of drug interactions with antiretroviral therapy (ART), adolescents with HIV infection present a challenge to prescribing contraception. Many antiretroviral agents have interactions with COCs, and a physician with expertise in HIV care should be consulted when prescribing hormonal contraception for an HIV-infected adolescent on ART.[58,245] The CDC and the World Health Organization provide guidance on prescribing different contraceptives for patients with HIV infection receiving ART.[246] Condoms are the preferred method of barrier contraception because of their demonstrated ability to decrease HIV transmission. Spermicides and diaphragms are contraindicated among HIV-positive women because of the potential for increased risk of genital lesions and potential increased risk of HIV transmission associated with nonoxynol-9. IUDs do not increase the risk of HIV acquisition or transmission and are safe and effective for HIV-infected individuals without increasing the risk of infections or complications in HIV-infected women. If COCs are used in HIV-infected adolescents receiving ART, a preparation containing ethinyl estradiol $\geq$30 μg should be prescribed.[58]

Data on the interactions between ART and hormonal contraceptives (both combined and progestin only) are limited, but effects are known to include increased ART toxicity and, in the case of ritonavir-boosted protease inhibitors, decreased contraceptive steroid concentrations, potentially compromising contraceptive effectiveness. Other ART regimens (eg, etravirine-containing regimens) are teratogenic, necessitating highly effective contraceptives.[246]

Adolescent Recipients of Solid Organ Transplantation

The improved survival of pediatric recipients of solid organ transplantation has prompted increased attention to quality-of-life issues, including involvement in romantic and sexual relationships, issues that are typically addressed by the patient's pediatrician. Neither transplantation nor immunosuppressant medications decrease fertility, and conception can occur as early as 3 weeks after liver transplantation.[247,248] Similar to other adolescents with chronic illnesses, transplant recipients are likely to be as sexually active as their peers.[225,249–253] However, because these patients may underestimate their own fertility and because subspecialty physicians underestimate sexual activity and contraceptive needs in patients with chronic disease, it is imperative that primary care physicians assess these issues.[254–256]

For transplant recipients who choose not to remain abstinent, a highly effective method is indicated. Patients who have established normal organ function and are stable at least 6 to 8 months after transplantation can use any of the currently available hormonal contraceptives, provided they do not have other contraindications to the estrogen component.[58,254,257,258–260] Contraindications to estrogen, however, occur more commonly in transplant recipients. For example, COCs should not be prescribed to patients with active liver dysfunction or coronary artery disease.[139] Also, deterioration of organ function or episodes of rejection would require reevaluation and consideration of substituting a nonhormonal method, at least temporarily. Given the excess risks associated with unplanned pregnancies in transplant recipients, knowledge about the availability of EC is especially important.

Potential drug interactions should be assessed, both to avoid drug toxicities and to maintain the effectiveness of all prescribed medications.[261] For example, COCs can increase concentrations of immunosuppressive medications, such as cyclosporine, which has a narrow

Downloaded from http://publications.aap.org/pediatrics/article-pdf/134/4/e1257/1100677/peds_2014-2300.pdf by Health Sciences Library@Orlando Health, Melanie Capobianco on 18 January 2022

therapeutic window and significant toxicities (see Table 7). Patient care decisions may require consultation with a clinical pharmacologist. To avoid monthly fluctuations in drug concentrations, patients using combined methods should use them continuously, without a hormone-free interval. Although 1 study suggests that immunosuppressant concentrations remain stable with use of the contraceptive vaginal ring,[259] both the ring and the patch are sufficiently similar to COCs that, until further data are available, they should be used with the same precautions that apply to COCs. Drug interactions with progestin-only methods are uncommon; however, monitoring cyclosporine concentrations is advisable.[262]

Historically, IUDs have been considered contraindicated in immunosuppressed patents because of theoretical risks of both decreased efficacy and increased risk of infection. However, more recent evidence argues against these theoretical risks,[263] and the CDC does not consider IUDs contraindicated in patients with stable graft function.[58] Although data are currently limited, anecdotal experience with adult transplant recipients suggests the levonorgestrel IUD can be an excellent choice because of the lack of drug interactions and outstanding contraceptive effectiveness.

Adolescent Oncology and Other Medically Complex Patients

Pediatricians may be called on to provide contraceptives for patients with cancer and other complex medical illnesses. In addition to pregnancy prevention, these adolescents may need menstrual suppression for heavy menstrual bleeding, bleeding disorders, or chemotherapy. Other medical conditions, such as rheumatologic illnesses, may present issues related to estrogen use, thromboembolism, or medication interactions. For these and other complex illnesses, the principles have been discussed in the previous sections, and consultation with appropriate adolescent medicine, adolescent gynecology, or family-planning specialists can be sought.

ADHERENCE AND FOLLOW-UP

Frequent follow-up is important to maximize adherence 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 routine examinations, reassessment for contraception method, STI surveillance, and other sexual health preventive measures, such as human papillomavirus immunization. The timing and frequency of reassessment will vary depending on the contraceptive method and the patient's other health needs. An internal pelvic examination is not necessary for hormonal contraception (for a more complete discussion of

TABLE 7 Immunosuppressant Adverse Effects and Interactions With Hormonal Contraception

Type of Medication	Drug Interactions	Adverse Effects Influencing Contraception	Contraceptive Considerations
Corticosteroids (prednisone)	COCs may increase plasma concentrations of corticosteroids; monitor for increased corticosteroid effects	Hypertension	Severe and uncontrolled hypertension is a contraindication to COC use.
		Diabetes	Low-dose pills have minimal impact on glucose metabolism.
		Weight gain, osteoporosis	Monitor weight and BMD carefully if DMPA is used.
Azathioprine (Imuran[a])		Liver toxicity	Liver dysfunction interferes with estrogen metabolism.
Mycophenolate mofetil (CellCept[b])		Diarrhea, vomiting	Severe gastrointestinal disturbance could decrease COC absorption.
Cyclosporine, tacrolimus (Prograf,[c] FK506)	COCs may increase levels; monitor blood levels closely	Hypertension	Severe hypertension is a contraindication to COC use.
		Hyperlipidemia	COCs have minimal effect on lipids.
		Hyperkalemia	Drospirenone (a progestin with spironolactonelike activity) is contraindicated with hyperkalemia.
		Diabetes	Low-dose pills have minimal impact on glucose metabolism.
		Headache	Headache can be an adverse effect of steroid hormones: monitor headache frequency.[d]
Sirolimus (Rapamune[e])	COCs may increase levels; monitor blood levels closely	Hyperlipidemia	COCs have minimal effect on lipids.

Reproduced with permission from Sucato GS, Murray PJ. Gynecologic issues of the adolescent female solid organ transplant recipient. *Pediatr Clin North Am.* 2003;50(6):1521–1542.

[a] Triton Pharma Inc, Concord, Ontario.

[b] Genentech USA Inc, South San Francisco, CA.

[c] Astellas Ireland Co Ltd, Kerry, Ireland.

[d] If headaches increase after initiation of contraceptive method or neurologic symptoms accompany migraine headache, consider changing method.

[e] Pfizer, Philadelphia, PA.

Downloaded from http://publications.aap.org/pediatrics/article-pdf/134/4/e1257/1100677/peds_2014-2300.pdf by Health Sciences Library@Orlando Health, Melanie Capobianco on 18 January 2022

gynecologic examinations of adolescents in the pediatric office setting, see the 2010 AAP clinical report on gynecologic examinations for adolescents).[117] Regularly scheduled visits need to occur to assess contraceptive issues, such as use, adherence, adverse effects, and complications. Adolescents should receive ongoing support and reinforcement by using motivational interviewing approaches to enhance effective and consistent contraceptive use, including engaging parental support for contraceptive adherence, when possible. In addition, condom use at each sexual intercourse must be advised and reinforced at every visit. Individual factors, relationship factors, family support, knowledge and understanding of contraceptives, personal resources, access to confidential care, and fertility intentions have all been demonstrated to affect adolescent contraceptive choice. Adolescents rely on trusted health professionals, such as pediatricians, for accurate information, for individualized counseling and prescribing, and for support and problem-solving around continuation and adherence.

LEAD AUTHORS

Mary A. Ott, MD, MA, FAAP
Gina S. Sucato, MD, MPH, FAAP

COMMITTEE ON ADOLESCENCE, 2013–2014

Paula K. Braverman, MD, Chairperson
William P. Adelman, MD, FAAP
Elizabeth M. Alderman, MD, FAAP, FSHAM
Cora C. Breuner, MD, MPH, FAAP
David A. Levine, MD, FAAP
Arik V. Marcell, MD, FAAP
Rebecca F. O'Brien, MD, FAAP

PAST COMMITTEE MEMBER

Pamela J. Murray, MD, MPH, FAAP

LIAISONS

Loretta E. Gavin, PhD, MPH – *Centers for Disease Control and Prevention*
Margo Lane, MD, FRCPC – *Canadian Pediatric Society*
Rachel J. Miller, MD – *American College of Obstetricians and Gynecologists*
Benjamin Shain, MD, PhD – *American Academy of Child and Adolescent Psychiatry*

STAFF

Karen S. Smith
James D. Baumberger, MPP

REFERENCES

1. American Academy of Pediatrics, Committee on Adolescence. Policy statement: contraception for adolescents. *Pediatrics*. 2014, In press
2. Eaton DK, Kann L, Kinchen S, et al; Centers for Disease Control and Prevention (CDC). Youth risk behavior surveillance - United States, 2011. *MMWR Surveill Summ*. 2012; 61(4):1–162
3. Kost K, Henshaw S, Carlin L. US Teenage Pregnancies, Births and Abortions: National and State Trends and Trends by Race and Ethnicity. New York, NY: Guttmacher Institute; 2010
4. Finer LB, Zolna MR. Unintended pregnancy in the United States: incidence and disparities, 2006. *Contraception*. 2011;84(5): 478–485
5. Santelli JS, Lindberg LD, Finer LB, Singh S. Explaining recent declines in adolescent pregnancy in the United States: the contribution of abstinence and improved contraceptive use. *Am J Public Health*. 2007;97(1):150–156
6. Abma JC, Martinez GM, Copen CE. Teenagers in the United States: sexual activity, contraceptive use, and childbearing, national survey of family growth 2006-2008. *Vital Health Stat 23*. 2010; (30):1–47
7. Hagan JF, Shaw JS, Duncan PM. *Bright Futures: Guidelines for Health Supervision of Infants, Children, and Adolescents*. 3rd ed. Elk Grove Village, IL: American Academy of Pediatrics; 2008
8. Center for Adolescent Health and the Law. *State Minor Consent Laws: A Summary*. 3rd ed. Chapel Hill, NC: Center for Adolescent Health and the Law; 2010
9. Guttmacher Institute. An Overview of Minors' Consent Law as of January 1, 2014. State Policies in Brief as of June 1, 2014. Available at: www.guttmacher.org/statecenter/spibs/spib_MACS.pdf. Accessed June 20, 2014
10. English A, Ford CA. The HIPAA privacy rule and adolescents: legal questions and clinical challenges. *Perspect Sex Reprod Health*. 2004;36(2):80–86
11. Spooner SA; Council on Clinical Information Technology, American Academy of Pediatrics. Special requirements of electronic health record systems in pediatrics. *Pediatrics*. 2007;119(3):631–637
12. Ford CA, Millstein SG, Halpern-Felsher BL, Irwin CE Jr. Influence of physician confidentiality assurances on adolescents' willingness to disclose information and seek future health care. A randomized controlled trial. *JAMA*. 1997;278(12):1029–1034
13. Lehrer JA, Pantell R, Tebb K, Shafer MA. Forgone health care among U.S. adolescents: associations between risk characteristics and confidentiality concern. *J Adolesc Health*. 2007;40(3):218–226
14. Lyren A, Kodish E, Lazebnik R, O'Riordan MA. Understanding confidentiality: perspectives of African American adolescents and their parents. *J Adolesc Health*. 2006; 39(2):261–265
15. Vo DX, Pate OL, Zhao H, Siu P, Ginsburg KR. Voices of Asian American youth: important characteristics of clinicians and clinical sites. *Pediatrics*. 2007;120(6). Available at: www.pediatrics.org/cgi/content/full/120/6/e1481
16. Blake DR, Kearney MH, Oakes JM, Druker SK, Bibace R. Improving participation in Chlamydia screening programs: perspectives of high-risk youth. *Arch Pediatr Adolesc Med*. 2003;157(6):523–529
17. Committee On Adolescence. Office-based care for lesbian, gay, bisexual, transgender, and questioning youth. *Pediatrics*. 2013;132(1):198–203
18. Klein JD, McNulty M, Flatau CN. Adolescents' access to care: teenagers' self-reported use of services and perceived access to confidential care. *Arch Pediatr Adolesc Med*. 1998;152(7):676–682
19. Reddy DM, Fleming R, Swain C. Effect of mandatory parental notification on adolescent girls' use of sexual health care services. *JAMA*. 2002;288(6):710–714
20. Zabin LS, Stark HA, Emerson MR. Reasons for delay in contraceptive clinic utilization. Adolescent clinic and nonclinic populations

Downloaded from http://publications.aap.org/pediatrics/article-pdf/134/4/e1257/1100677/peds_2014-2300.pdf by Health Sciences Library@Orlando Health, Melanie Capobianco on 18 January 2022

compared. *J Adolesc Health*. 1991;12(3):225–232

21. Guldi M. Fertility effects of abortion and birth control pill access for minors. *Demography*. 2008;45(4):817–827
22. Zavodny M. Fertility and parental consent for minors to receive contraceptives. *Am J Public Health*. 2004;94(8):1347–1351
23. Dempsey AF, Singer DD, Clark SJ, Davis MM. Adolescent preventive health care: what do parents want? *J Pediatr*. 2009;155(5):689.e1–694.e1
24. Jones RK, Purcell A, Singh S, Finer LB. Adolescents' reports of parental knowledge of adolescents' use of sexual health services and their reactions to mandated parental notification for prescription contraception. *JAMA*. 2005;293(3):340–348
25. Ott MA, Rosenberger JG, McBride KR, Woodcox SG. How do adolescents view health? Implications for state health policy. *J Adolesc Health*. 2011;48(4):398–403
26. Jones RK, Biddlecom AE. The more things change…: the relative importance of the Internet as a source of contraceptive information for teens. *Sexual Research and Social Policy*. 2011;8(1):27–37
27. Brown JD, Wissow LS. Discussion of sensitive health topics with youth during primary care visits: relationship to youth perceptions of care. *J Adolesc Health*. 2009;44(1):48–54
28. Centers for Disease Control and Prevention. *A Guide to Taking a Sexual History*. Atlanta, GA: Centers for Disease Control and Prevention; 2005
29. Ott MA, Pfeiffer EJ. "That's nasty" to curiosity: early adolescent cognitions about sexual abstinence. *J Adolesc Health*. 2009;44(6):575–581
30. Barnet B, Rapp T, DeVoe M, Mullins CD. Cost-effectiveness of a motivational intervention to reduce rapid repeated childbearing in high-risk adolescent mothers: a rebirth of economic and policy considerations. *Arch Pediatr Adolesc Med*. 2010;164(4):370–376
31. Kamb ML, Fishbein M, Douglas JM Jr, et al; Project RESPECT Study Group. Efficacy of risk-reduction counseling to prevent human immunodeficiency virus and sexually transmitted diseases: a randomized controlled trial. *JAMA*. 1998;280(13):1161–1167
32. Rollnick S, Butler CC, Kinnersley P, Gregory J, Mash B. Motivational interviewing. *BMJ*. 2010;340:c1900
33. Erickson SJ, Gerstle M, Feldstein SW. Brief interventions and motivational interviewing with children, adolescents, and their parents in pediatric health care settings: a review. *Arch Pediatr Adolesc Med*. 2005;159(12):1173–1180
34. Blum RW. Healthy youth development as a model for youth health promotion. A review. *J Adolesc Health*. 1998;22(5):368–375
35. Ott MA, Labbett RL, Gold MA. Counseling adolescents about abstinence in the office setting. *J Pediatr Adolesc Gynecol*. 2007;20(1):39–44
36. Ott MA, Millstein SG, Ofner S, Halpern-Felsher BL. Greater expectations: adolescents' positive motivations for sex. *Perspect Sex Reprod Health*. 2006;38(2):84–89
37. Ott MA, Pfeiffer EJ, Fortenberry JD. Perceptions of sexual abstinence among high-risk early and middle adolescents. *J Adolesc Health*. 2006;39(2):192–198
38. Naar-King S, Suarez M. *Motivational Interviewing with Adolescents and Young Adults*. New York, NY: Guilford Press; 2010
39. Pinkerton SD. A relative risk-based, disease-specific definition of sexual abstinence failure rates. *Health Educ Behav*. 2001;28(1):10–20
40. Brückner H, Bearman P. After the promise: the STD consequences of adolescent virginity pledges. *J Adolesc Health*. 2005;36(4):271–278
41. Hatcher RA, Trussell J, Nelson AL, Cates W Jr, Kowal D, Policar MS. *Contraceptive Technology*. 20th rev ed. Valley Stream, NY: Ardent Media; 2011
42. Centers for Disease Control and Prevention. US selected practice recommendations for contraceptive use, 2013. *MMWR Recomm Rep*. 2013;62(RR-5):1–60
43. Trussell J. Update on and correction to the cost-effectiveness of contraceptives in the United States. *Contraception*. 2012;85(6):611
44. Graesslin O, Korver T. The contraceptive efficacy of Implanon: a review of clinical trials and marketing experience. *Eur J Contracept Reprod Health Care*. 2008;13(suppl 1):4–12
45. Levine JP, Sinofsky FE, Christ MF; Implanon US Study Group. Assessment of Implanon insertion and removal. *Contraception*. 2008;78(5):409–417
46. Vidin E, Garbin O, Rodriguez B, Favre R, Bettahar-Lebugle K. Removal of etonogestrel contraceptive implants in the operating theater: report on 28 cases. *Contraception*. 2007;76(1):35–39
47. Wechselberger G, Wolfram D, Pülzl P, Soelder E, Schoeller T. Nerve injury caused by removal of an implantable hormonal contraceptive. *Am J Obstet Gynecol*. 2006;195(1):323–326
48. Guazzelli CA, de Queiroz FT, Barbieri M, Torloni MR, de Araujo FF. Etonogestrel implant in postpartum adolescents: bleeding pattern, efficacy and discontinuation rate. *Contraception*. 2010;82(3):256–259
49. Lewis LN, Doherty DA, Hickey M, Skinner SR. Implanon as a contraceptive choice for teenage mothers: a comparison of contraceptive choices, acceptability and repeat pregnancy. *Contraception*. 2010;81(5):421–426
50. Lakha F, Glasier AF. Continuation rates of Implanon in the UK: data from an observational study in a clinical setting. *Contraception*. 2006;74(4):287–289
51. Harvey C, Seib C, Lucke J. Continuation rates and reasons for removal among Implanon users accessing two family planning clinics in Queensland, Australia. *Contraception*. 2009;80(6):527–532
52. Darney P, Patel A, Rosen K, Shapiro LS, Kaunitz AM. Safety and efficacy of a single-rod etonogestrel implant (Implanon): results from 11 international clinical trials. *Fertil Steril*. 2009;91(5):1646–1653
53. Mansour D, Korver T, Marintcheva-Petrova M, Fraser IS. The effects of Implanon on menstrual bleeding patterns. *Eur J Contracept Reprod Health Care*. 2008;13(13 suppl 1):13–28
54. Mansour D, Bahamondes L, Critchley H, Darney P, Fraser IS. The management of unacceptable bleeding patterns in etonogestrel-releasing contraceptive implant users. *Contraception*. 2011;83(3):202–210
55. Beerthuizen R, van Beek A, Massai R, Mäkäräinen L, Hout J, Bennink HC. Bone mineral density during long-term use of the progestagen contraceptive implant Implanon compared to a non-hormonal method of contraception. *Hum Reprod*. 2000;15(1):118–122
56. Bahamondes L, Monteiro-Dantas C, Espejo-Arce X, et al. A prospective study of the forearm bone density of users of etonorgestrel- and levonorgestrel-releasing contraceptive implants. *Hum Reprod*. 2006;21(2):466–470
57. Pongsatha S, Ekmahachai M, Suntornlimsiri N, Morakote N, Chaovisitsaree S. Bone mineral density in women using the subdermal contraceptive implant Implanon for at least 2 years. *Int J Gynaecol Obstet*. 2010;109(3):223–225
58. Centers for Disease Control and Prevention. US medical eligibility criteria for contraceptive use, 2010. *MMWR Recomm Rep*. 2010;59(RR-4):1–86
59. American College of Obstetricians and Gynecologists. ACOG Practice Bulletin No. 121: Long-acting reversible contraception: implants and intrauterine devices. *Obstet Gynecol*. 2011;118(1):184–196

Downloaded from http://publications.aap.org/pediatrics/article-pdf/134/4/e1257/1100677/peds_2014-2300.pdf by Health Sciences Library@Orlando Health, Melanie Capobianco on 18 January 2022

60. Skyla [package insert]. Wayne, NJ: Bayer HealthCare Pharmaceuticals; 2013. Available at: http://labeling.bayerhealthcare.com/html/products/pi/Skyla_PI.pdf. Accessed January 15, 2014
61. Mirena [package insert]. Wayne, NJ: Bayer HealthCare Pharmaceuticals; 2013. Available at: http://labeling.bayerhealthcare.com/html/products/pi/Mirena_PI.pdf. Accessed January 15, 2014
62. Paragard [package insert]. Sellersville, PA: Teva Woman's Health Inc/Teva Pharmaceuticals; 2011. Available at: http://paragard.com/Pdf/ParaGard-PI.pdf. June 22, 2104
63. Long-term reversible contraception. Twelve years of experience with the TCu380A and TCu220C. *Contraception*. 1997;56(6):341–352
64. Finer LB, Jerman J, Kavanaugh ML. Changes in use of long-acting contraceptive methods in the United States, 2007–2009. *Fertil Steril*. 2012;98(4):893–897
65. Hubacher D, Lara-Ricalde R, Taylor DJ, Guerra-Infante F, Guzmán-Rodríguez R. Use of copper intrauterine devices and the risk of tubal infertility among nulligravid women. *N Engl J Med*. 2001;345(8):561–567
66. Hov GG, Skjeldestad FE, Hilstad T. Use of IUD and subsequent fertility—follow-up after participation in a randomized clinical trial. *Contraception*. 2007;75(2):88–92
67. Penney G, Brechin S, de Souza A, et al; Faculty of Family Planning and Reproductive Health Care Clinical Effectiveness Unit. FFPRHC Guidance (January 2004). The copper intrauterine device as long-term contraception. *J Fam Plann Reprod Health Care*. 2004;30(1):29–41, quiz 42
68. Mohllajee AP, Curtis KM, Peterson HB. Does insertion and use of an intrauterine device increase the risk of pelvic inflammatory disease among women with sexually transmitted infection? A systematic review. *Contraception*. 2006;73(2):145–153
69. Farley TM, Rosenberg MJ, Rowe PJ, Chen JH, Meirik O. Intrauterine devices and pelvic inflammatory disease: an international perspective. *Lancet*. 1992;339(8796):785–788
70. Grimes DA. Intrauterine device and upper-genital-tract infection. *Lancet*. 2000;356(9234):1013–1019
71. Hubacher D. Copper intrauterine device use by nulliparous women: review of side effects. *Contraception*. 2007;75(suppl 6):S8–S11
72. Brockmeyer A, Kishen M, Webb A. Experience of IUD/IUS insertions and clinical performance in nulliparous women—a pilot study. *Eur J Contracept Reprod Health Care*. 2008;13(3):248–254
73. Thonneau P, Almont T, de La Rochebrochard E, Maria B. Risk factors for IUD failure: results of a large multicentre case-control study. *Hum Reprod*. 2006;21(10):2612–2616
74. Suhonen S, Haukkamaa M, Jakobsson T, Rauramo I. Clinical performance of a levonorgestrel-releasing intrauterine system and oral contraceptives in young nulliparous women: a comparative study. *Contraception*. 2004;69(5):407–412
75. Godfrey EM, Memmel LM, Neustadt A, et al. Intrauterine contraception for adolescents aged 14-18 years: a multicenter randomized pilot study of levonorgestrel-releasing intrauterine system compared to the Copper T 380A. *Contraception*. 2010;81(2):123–127
76. Paterson H, Ashton J, Harrison-Woolrych M. A nationwide cohort study of the use of the levonorgestrel intrauterine device in New Zealand adolescents. *Contraception*. 2009;79(6):433–438
77. Pillai M, O'Brien K, Hill E. The levonorgestrel intrauterine system (Mirena) for the treatment of menstrual problems in adolescents with medical disorders, or physical or learning disabilities. *BJOG*. 2010;117(2):216–221
78. Toma A, Jamieson MA. Revisiting the intrauterine contraceptive device in adolescents. *J Pediatr Adolesc Gynecol*. 2006;19(4):291–296
79. Lara-Torre E, Spotswood L, Correia N, Weiss PM. Intrauterine contraception in adolescents and young women: a descriptive study of use, side effects, and compliance. *J Pediatr Adolesc Gynecol*. 2011;24(1):39–41
80. Hillard PJ. Menstrual suppression with the levonorgestrel intrauterine system in girls with developmental delay. *J Pediatr Adolesc Gynecol*. 2012;25(5):308–313
81. Hillman JB, Miller RJ, Inge TH. Menstrual concerns and intrauterine contraception among adolescent bariatric surgery patients. *J Womens Health (Larchmt)*. 2011;20(4):533–538
82. Kaunitz AM, Darney PD, Ross D, Wolter KD, Speroff L. Subcutaneous DMPA vs. intramuscular DMPA: a 2-year randomized study of contraceptive efficacy and bone mineral density. *Contraception*. 2009;80(1):7–17
83. American College of Obstetricians and Gynecologists Committee on Gynecologic Practice. ACOG Committee Opinion No. 415: Depot medroxyprogesterone acetate and bone effects. *Obstet Gynecol*. 2008;112(3):727–730
84. Kaunitz AM. Depot medroxyprogesterone acetate contraception and the risk of breast and gynecologic cancer. *J Reprod Med*. 1996;41(suppl 5):419–427
85. Rodriguez MI, Kaunitz AM. An evidence-based approach to postpartum use of depot medroxyprogesterone acetate in breastfeeding women. *Contraception*. 2009;80(1):4–6
86. Herzog AG. Progesterone therapy in women with epilepsy: a 3-year follow-up. *Neurology*. 1999;52(9):1917–1918
87. de Abood M, de Castillo Z, Guerrero F, Espino M, Austin KL. Effect of Depo-Provera or Microgynon on the painful crises of sickle cell anemia patients. *Contraception*. 1997;56(5):313–316
88. Manchikanti A, Grimes DA, Lopez LM, Schulz KF. Steroid hormones for contraception in women with sickle cell disease. *Cochrane Database Syst Rev*. 2007;(2):CD006261
89. van Hylckama Vlieg A, Helmerhorst FM, Rosendaal FR. The risk of deep venous thrombosis associated with injectable depot-medroxyprogesterone acetate contraceptives or a levonorgestrel intrauterine device. *Arterioscler Thromb Vasc Biol*. 2010;30(11):2297–2300
90. Lestishock L, Pariseau C, Rooholamini S, Ammerman S. Anaphylaxis from depot medroxyprogesterone acetate in an adolescent girl. *Obstet Gynecol*. 2011;118(2 pt 2):443–445
91. Hubacher D, Lopez L, Steiner MJ, Dorflinger L. Menstrual pattern changes from levonorgestrel subdermal implants and DMPA: systematic review and evidence-based comparisons. *Contraception*. 2009;80(2):113–118
92. Arias RD, Jain JK, Brucker C, Ross D, Ray A. Changes in bleeding patterns with depot medroxyprogesterone acetate subcutaneous injection 104 mg. *Contraception*. 2006;74(3):234–238
93. Hubacher D, Goco N, Gonzalez B, Taylor D. Factors affecting continuation rates of DMPA. *Contraception*. 1999;60(6):345–351
94. Canto De Cetina TE, Canto P, Ordoñez Luna M. Effect of counseling to improve compliance in Mexican women receiving depot-medroxyprogesterone acetate. *Contraception*. 2001;63(3):143–146
95. Jain J, Jakimiuk AJ, Bode FR, Ross D, Kaunitz AM. Contraceptive efficacy and safety of DMPA-SC. *Contraception*. 2004;70(4):269–275
96. Bonny AE, Ziegler J, Harvey R, Debanne SM, Secic M, Cromer BA. Weight gain in obese and nonobese adolescent girls initiating depot medroxyprogesterone, oral contraceptive pills, or no hormonal contraceptive method. *Arch Pediatr Adolesc Med*. 2006;160(1):40–45

Downloaded from http://publications.aap.org/pediatrics/article-pdf/134/4/e1257/1100677/peds_2014-2300.pdf by Health Sciences Library@Orlando Health, Melanie Capobianco on 18 January 2022

97. Espey E, Steinhart J, Ogburn T, Qualls C. Depo-provera associated with weight gain in Navajo women. *Contraception*. 2000;62(2):55–58
98. Risser WL, Gefter LR, Barratt MS, Risser JM. Weight change in adolescents who used hormonal contraception. *J Adolesc Health*. 1999;24(6):433–436
99. Berenson AB, Rahman M. Changes in weight, total fat, percent body fat, and central-to-peripheral fat ratio associated with injectable and oral contraceptive use. *Am J Obstet Gynecol*. 2009;200(3):329.e1–329.e8
100. Mangan SA, Larsen PG, Hudson S. Overweight teens at increased risk for weight gain while using depot medroxyprogesterone acetate. *J Pediatr Adolesc Gynecol*. 2002;15(2):79–82
101. Lopez LM, Edelman A, Chen-Mok M, Trussell J, Helmerhorst FM. Progestin-only contraceptives: effects on weight. *Cochrane Database Syst Rev*. 2011;(4):CD008815
102. Bonny AE, Secic M, Cromer BA. A longitudinal comparison of body composition changes in adolescent girls receiving hormonal contraception. *J Adolesc Health*. 2009;45(4):423–425
103. Bonny AE, Secic M, Cromer B. Early weight gain related to later weight gain in adolescents on depot medroxyprogesterone acetate. *Obstet Gynecol*. 2011;117(4):793–797
104. Le YC, Rahman M, Berenson AB. Early weight gain predicting later weight gain among depot medroxyprogesterone acetate users. *Obstet Gynecol*. 2009;114(2 pt 1):279–284
105. Cromer BA, Blair JM, Mahan JD, Zibners L, Naumovski Z. A prospective comparison of bone density in adolescent girls receiving depot medroxyprogesterone acetate (Depo-Provera), levonorgestrel (Norplant), or oral contraceptives. *J Pediatr*. 1996;129(5):671–676
106. Lara-Torre E, Edwards CP, Perlman S, Hertweck SP. Bone mineral density in adolescent females using depot medroxyprogesterone acetate. *J Pediatr Adolesc Gynecol*. 2004;17(1):17–21
107. Cromer BA, Stager M, Bonny A, et al. Depot medroxyprogesterone acetate, oral contraceptives and bone mineral density in a cohort of adolescent girls. *J Adolesc Health*. 2004;35(6):434–441
108. Rome E, Ziegler J, Secic M, et al. Bone biochemical markers in adolescent girls using either depot medroxyprogesterone acetate or an oral contraceptive. *J Pediatr Adolesc Gynecol*. 2004;17(6):373–377
109. DepoProvera 150 mg and Depo SubQ Provera 104 [package inserts]. Cambridge, MA: Pfizer; 2005
110. Scholes D, LaCroix AZ, Ichikawa LE, Barlow WE, Ott SM. Change in bone mineral density among adolescent women using and discontinuing depot medroxyprogesterone acetate contraception. *Arch Pediatr Adolesc Med*. 2005;159(2):139–144
111. Harel Z, Johnson CC, Gold MA, et al. Recovery of bone mineral density in adolescents following the use of depot medroxyprogesterone acetate contraceptive injections. *Contraception*. 2010;81(4):281–291
112. Berenson AB, Rahman M, Breitkopf CR, Bi LX. Effects of depot medroxyprogesterone acetate and 20-microgram oral contraceptives on bone mineral density. *Obstet Gynecol*. 2008;112(4):788–799
113. Kaunitz AM, Grimes DA. Removing the black box warning for depot medroxyprogesterone acetate. *Contraception*. 2011;84(3):212–213
114. Vestergaard P, Rejnmark L, Mosekilde L. The effects of depot medroxyprogesterone acetate and intrauterine device use on fracture risk in Danish women. *Contraception*. 2008;78(6):459–464
115. Meier C, Brauchli YB, Jick SS, Kraenzlin ME, Meier CR. Use of depot medroxyprogesterone acetate and fracture risk. *J Clin Endocrinol Metab*. 2010;95(11):4909–4916
116. Institute of Medicine. Dietary reference intakes for calcium and vitamin D. Washington, DC: National Academies Press; 2010. Available at: www.iom.edu/Reports/2010/Dietary-Reference-Intakes-for-calcium-and-vitamin-D.aspx. Accessed January 15, 2014
117. Braverman PK, Breech L; Committee on Adolescence. American Academy of Pediatrics. Clinical report—gynecologic examination for adolescents in the pediatric office setting. *Pediatrics*. 2010;126(3):583–590
118. Gallo MF, Grimes DA, Schulz KF, Helmerhorst FM. Combination estrogen-progestin contraceptives and body weight: systematic review of randomized controlled trials. *Obstet Gynecol*. 2004;103(2):359–373
119. Böttcher B, Radenbach K, Wildt L, Hinney B. Hormonal contraception and depression: a survey of the present state of knowledge. *Arch Gynecol Obstet*. 2012;286(1):231–236
120. Ott MA, Shew ML, Ofner S, Tu W, Fortenberry JD. The influence of hormonal contraception on mood and sexual interest among adolescents. *Arch Sex Behav*. 2008;37(4):605–613
121. Dickey R. *Managing Contraceptive Pill Patients*. Fort Collins, CO: EMIS Inc Medical Publishers; 2010
122. Canobbio MM. Contraception for the adolescent and young adult with congenital heart disease. *Nurs Clin North Am*. 2004;39(4):769–785
123. Trenor CC III, Chung RJ, Michelson AD, et al. Hormonal contraception and thrombotic risk: a multidisciplinary approach. *Pediatrics*. 2011;127(2):347–357
124. Vandenbroucke JP, Rosing J, Bloemenkamp KW, et al. Oral contraceptives and the risk of venous thrombosis. *N Engl J Med*. 2001;344(20):1527–1535
125. US Food and Drug Administration. Updated information about the risk of blood clots in women taking birth control pills containing drospirenone. Silver Spring, MD: US Food and Drug Administration; 2012. Available at: www.fda.gov/Drugs/DrugSafety/ucm299305.htm. Accessed January 15, 2014
126. van Hylckama Vlieg A, Helmerhorst FM, Vandenbroucke JP, Doggen CJ, Rosendaal FR. The venous thrombotic risk of oral contraceptives, effects of oestrogen dose and progestogen type: results of the MEGA case-control study. *BMJ*. 2009;339:b2921
127. Stein PD, Kayali F, Olson RE. Incidence of venous thromboembolism in infants and children: data from the National Hospital Discharge Survey. *J Pediatr*. 2004;145(4):563–565
128. Walker ID. Venous and arterial thrombosis during pregnancy: epidemiology. *Semin Vasc Med*. 2003;3(1):25–32
129. Heit JA, Kobbervig CE, James AH, Petterson TM, Bailey KR, Melton LJ III. Trends in the incidence of venous thromboembolism during pregnancy or postpartum: a 30-year population-based study. *Ann Intern Med*. 2005;143(10):697–706
130. Gaffield ME, Culwell KR, Lee CR. The use of hormonal contraception among women taking anticonvulsant therapy. *Contraception*. 2011;83(1):16–29
131. Dickinson BD, Altman RD, Nielsen NH, Sterling ML; Council on Scientific Affairs, American Medical Association. Drug interactions between oral contraceptives and antibiotics. *Obstet Gynecol*. 2001 Nov;98(5 Pt 1):853–60
132. Toh S, Mitchell AA, Anderka M, de Jong-van den Berg LT, Hernández-Díaz S; National Birth Defects Prevention Study. Antibiotics and oral contraceptive failure—a case-crossover study. *Contraception*. 2011;83(5):418–425
133. Sucato GS, Gold MA. Extended cycling of oral contraceptive pills for adolescents. *J Pediatr Adolesc Gynecol*. 2002;15(5):325–327
134. Sucato GS, Gerschultz KL. Extended cycle hormonal contraception in adolescents.

Downloaded from http://publications.aap.org/pediatrics/article-pdf/134/4/e1257/1100677/peds_2014-2300.pdf by Health Sciences Library@Orlando Health, Melanie Capobianco on 18 January 2022

Curr Opin Obstet Gynecol. 2005;17(5):461–465

135. Hamilton A, Marshal MP, Murray PJ. Autism spectrum disorders and menstruation. *J Adolesc Health*. 2011;49(4):443–445
136. Schlaff WD, Lynch AM, Hughes HD, Cedars MI, Smith DL. Manipulation of the pill-free interval in oral contraceptive pill users: the effect on follicular suppression. *Am J Obstet Gynecol*. 2004;190(4):943–951
137. Birtch RL, Olatunbosun OA, Pierson RA. Ovarian follicular dynamics during conventional vs. continuous oral contraceptive use. *Contraception*. 2006;73(3):235–243
138. Baerwald AR, Olatunbosun OA, Pierson RA. Ovarian follicular development is initiated during the hormone-free interval of oral contraceptive use. *Contraception*. 2004;70(5):371–377
139. ACOG Committee on Practice Bulletins-Gynecology. ACOG practice bulletin. No. 73: Use of hormonal contraception in women with coexisting medical conditions. *Obstet Gynecol*. 2006;107(6):1453–1472
140. Vessey M, Painter R. Oral contraceptive use and cancer. Findings in a large cohort study, 1968-2004. *Br J Cancer*. 2006;95(3):385–389
141. Carey AS, Chiappetta L, Tremont K, Murray PJ, Gold MA. The contraceptive vaginal ring: female adolescents' knowledge, attitudes and plans for use. *Contraception*. 2007;76(6):444–450
142. Veres S, Miller L, Burington B. A comparison between the vaginal ring and oral contraceptives. *Obstet Gynecol*. 2004;104(3):555–563
143. Barnhart KT, Timbers K, Pretorius ES, Lin K, Shaunik A. In vivo assessment of NuvaRing placement. *Contraception*. 2005;72(3):196–199
144. Verhoeven CH, Dieben TO. The combined contraceptive vaginal ring, NuvaRing, and tampon co-usage. *Contraception*. 2004;69(3):197–199
145. Haring T, Mulders TM. The combined contraceptive ring NuvaRing and spermicide co-medication. *Contraception*. 2003;67(4):271–272
146. Verhoeven CH, van den Heuvel MW, Mulders TM, Dieben TO. The contraceptive vaginal ring, NuvaRing, and antimycotic co-medication. *Contraception*. 2004;69(2):129–132
147. Guida M, Di Spiezio Sardo A, Bramante S, et al. Effects of two types of hormonal contraception—oral versus intravaginal—on the sexual life of women and their partners. *Hum Reprod*. 2005;20(4):1100–1106
148. Roumen FJ, Apter D, Mulders TM, Dieben TO. Efficacy, tolerability and acceptability of a novel contraceptive vaginal ring releasing etonogestrel and ethinyl oestradiol. *Hum Reprod*. 2001;16(3):469–475
149. Dieben TO, Roumen FJ, Apter D. Efficacy, cycle control, and user acceptability of a novel combined contraceptive vaginal ring. *Obstet Gynecol*. 2002;100(3):585–593
150. Edwardson J, Jamshidi R. The contraceptive vaginal ring. *Semin Reprod Med*. 2010;28(2):133–139
151. Massai R, Mäkäräinen L, Kuukankorpi A, Klipping C, Duijkers I, Dieben T. The combined contraceptive vaginal ring and bone mineral density in healthy pre-menopausal women. *Hum Reprod*. 2005;20(10):2764–2768
152. Massaro M, Di Carlo C, Gargano V, Formisano C, Bifulco G, Nappi C. Effects of the contraceptive patch and the vaginal ring on bone metabolism and bone mineral density: a prospective, controlled, randomized study. *Contraception*. 2010;81(3):209–214
153. van den Heuvel MW, van Bragt AJ, Alnabawy AK, Kaptein MC. Comparison of ethinylestradiol pharmacokinetics in three hormonal contraceptive formulations: the vaginal ring, the transdermal patch and an oral contraceptive. *Contraception*. 2005;72(3):168–174
154. Fleischer K, van Vliet HA, Rosendaal FR, Rosing J, Tchaikovski S, Helmerhorst FM. Effects of the contraceptive patch, the vaginal ring and an oral contraceptive on APC resistance and SHBG: a cross-over study. *Thromb Res*. 2009;123(3):429–435
155. Jensen JT, Burke AE, Barnhart KT, Tillotson C, Messerle-Forbes M, Peters D. Effects of switching from oral to transdermal or transvaginal contraception on markers of thrombosis. *Contraception*. 2008;78(6):451–458
156. van Vliet HA, Rosendaal FR, Fleischer K, Rosing J, Helmerhorst FM. Effects of the contraceptive vaginal ring, the contraceptive transdermal patch and combined oral contraceptives on markers of hemostasis. *Contraception*. 2010;81(1):88–89, author reply 89–90
157. Stewart FH, Brown BA, Raine TR, Weitz TA, Harper CC. Adolescent and young women's experience with the vaginal ring and oral contraceptive pills. *J Pediatr Adolesc Gynecol*. 2007;20(6):345–351
158. Gilliam ML, Neustadt A, Kozloski M, Mistretta S, Tilmon S, Godfrey E. Adherence and acceptability of the contraceptive ring compared with the pill among students: a randomized controlled trial. *Obstet Gynecol*. 2010;115(3):503–510
159. Timmer CJ, Mulders TM. Pharmacokinetics of etonogestrel and ethinylestradiol released from a combined contraceptive vaginal ring. *Clin Pharmacokinet*. 2000;39(3):233–242
160. Miller L, Verhoeven CH, Hout J. Extended regimens of the contraceptive vaginal ring: a randomized trial. *Obstet Gynecol*. 2005;106(3):473–482
161. Sulak PJ, Smith V, Coffee A, Witt I, Kuehl AL, Kuehl TJ. Frequency and management of breakthrough bleeding with continuous use of the transvaginal contraceptive ring: a randomized controlled trial. *Obstet Gynecol*. 2008;112(3):563–571
162. Mosher WD, Jones J. Use of contraception in the United States: 1982-2008. *Vital Health Stat 23*. 2010;(29):1–44
163. Cole JA, Norman H, Doherty M, Walker AM. Venous thromboembolism, myocardial infarction, and stroke among transdermal contraceptive system users [published correction appears in *Obstet Gynecol*. 2008;111(6):1449]. *Obstet Gynecol*. 2007;109(2 pt 1):339–346
164. Dore DD, Norman H, Loughlin J, Seeger JD. Extended case-control study results on thromboembolic outcomes among transdermal contraceptive users. *Contraception*. 2010;81(5):408–413
165. Dore DD, Norman H, Seeger JD. Eligibility criteria in venous thromboembolism, myocardial infarction, and stroke among transdermal contraceptive system users. *Obstet Gynecol*. 2009;114(1):175
166. Jick S, Kaye JA, Li L, Jick H. Further results on the risk of nonfatal venous thromboembolism in users of the contraceptive transdermal patch compared to users of oral contraceptives containing norgestimate and 35 microg of ethinyl estradiol. *Contraception*. 2007;76(1):4–7
167. Jick SS, Hagberg KW, Hernandez RK, Kaye JA. Postmarketing study of ORTHO EVRA and levonorgestrel oral contraceptives containing hormonal contraceptives with 30 mcg of ethinyl estradiol in relation to nonfatal venous thromboembolism. *Contraception*. 2010;81(1):16–21
168. Jick SS, Hagberg KW, Kaye JA. ORTHO EVRA and venous thromboembolism: an update. *Contraception*. 2010;81(5):452–453
169. Jick SS, Kaye JA, Russmann S, Jick H. Risk of nonfatal venous thromboembolism with oral contraceptives containing norgestimate or desogestrel compared with oral contraceptives containing levonorgestrel. *Contraception*. 2006;73(6):566–570

Downloaded from http://publications.aap.org/pediatrics/article-pdf/134/4/e1257/1100677/peds_2014-2300.pdf by Health Sciences Library@Orlando Health, Melanie Capobianco on 18 January 2022

170. Sidney S, Cheetham TC, Connell FA, et al. Recent combined hormonal contraceptives (CHCs) and the risk of thromboembolism and other cardiovascular events in new users. *Contraception*. 2013;87(1):93–100
171. Urdl W, Apter D, Alperstein A, et al; ORTHO EVRA/EVRA 003 Study Group. Contraceptive efficacy, compliance and beyond: factors related to satisfaction with once-weekly transdermal compared with oral contraception. *Eur J Obstet Gynecol Reprod Biol*. 2005;121(2):202–210
172. Weisberg F, Bouchard C, Moreau M, et al; NRGEEP-CON-401 Study Group. Preference for and satisfaction of Canadian women with the transdermal contraceptive patch versus previous contraceptive method: an open-label, multicentre study. *J Obstet Gynaecol Can*. 2005;27(4):350–359
173. Archer DF, Bigrigg A, Smallwood GH, Shangold GA, Creasy GW, Fisher AC. Assessment of compliance with a weekly contraceptive patch (Ortho Evra/Evra) among North American women. *Fertil Steril*. 2002;77(2 suppl 2):S27–S31
174. Archer DF, Cullins V, Creasy GW, Fisher AC. The impact of improved compliance with a weekly contraceptive transdermal system (Ortho Evra) on contraceptive efficacy. *Contraception*. 2004;69(3):189–195
175. Harel Z, Riggs S, Vaz R, Flanagan P, Dunn K, Harel D. Adolescents' experience with the combined estrogen and progestin transdermal contraceptive method Ortho Evra. *J Pediatr Adolesc Gynecol*. 2005;18(2):85–90
176. Rubinstein ML, Halpern-Felsher BL, Irwin CE Jr. An evaluation of the use of the transdermal contraceptive patch in adolescents. *J Adolesc Health*. 2004;34(5):395–401
177. Bakhru A, Stanwood N. Performance of contraceptive patch compared with oral contraceptive pill in a high-risk population. *Obstet Gynecol*. 2006;108(2):378–386
178. LaGuardia KD. Performance of contraceptive patch compared with oral contraceptive pill in a high-risk population. *Obstet Gynecol*. 2006;108(6):1553–1554
179. Sucato GS, Land SR, Murray PJ, Cecchini R, Gold MA. Adolescents' experiences using the contraceptive patch versus pills. *J Pediatr Adolesc Gynecol*. 2011;24(4):197–203
180. Logsdon S, Richards J, Omar HA. Long-term evaluation of the use of the transdermal contraceptive patch in adolescents. *ScientificWorldJournal*. 2004;4:512–516
181. Thurman AR, Hammond N, Brown HE, Roddy ME. Preventing repeat teen pregnancy: postpartum depot medroxyprogesterone acetate, oral contraceptive pills, or the patch? *J Pediatr Adolesc Gynecol*. 2007;20(2):61–65
182. Lopez LM, Grimes DA, Gallo MF, Schulz KF. Skin patch and vaginal ring versus combined oral contraceptives for contraception. *Cochrane Database Syst Rev*. 2010;(3):CD003552
183. Creinin MD, Meyn LA, Borgatta L, et al. Multicenter comparison of the contraceptive ring and patch: a randomized controlled trial. *Obstet Gynecol*. 2008;111(2 pt 1):267–277
184. Stricker T, Sennhauser FH. Allergic contact dermatitis due to transdermal contraception patch. *J Pediatr*. 2006;148(6):845
185. Raine TR, Epstein LB, Harper CC, Brown BA, Boyer CB. Attitudes toward the vaginal ring and transdermal patch among adolescents and young women. *J Adolesc Health*. 2009;45(3):262–267
186. Sucato GS, Bhatt SK, Murray PJ, Ott MA. Transdermal contraception as a model for adolescent use of new methods. *J Adolesc Health*. 2011;49(4):357–362
187. Harel Z, Riggs S, Vaz R, Flanagan P, Harel D, Machan JT. Bone accretion in adolescents using the combined estrogen and progestin transdermal contraceptive method Ortho Evra: a pilot study. *J Pediatr Adolesc Gynecol*. 2010;23(1):23–31
188. Martinez G, Copen CE, Abma JC. Teenagers in the United States: sexual activity, contraceptive use, and childbearing, 2006-2010 national survey of family growth. *Vital Health Stat 23*. 2011;(31):1–35
189. Centers for Disease Control and Prevention. Male latex condoms and sexually transmitted diseases: condom fact sheet in brief. Atlanta, GA: Centers for Disease Control and Prevention. Available at: www.cdc.gov/condomeffectiveness/brief.html. Accessed January 15, 2014
190. Holmes KK, Levine R, Weaver M. Effectiveness of condoms in preventing sexually transmitted infections. *Bull World Health Organ*. 2004;82(6):454–461
191. Gallo MF, Steiner MJ, Warner L, et al. Self-reported condom use is associated with reduced risk of chlamydia, gonorrhea, and trichomoniasis. *Sex Transm Dis*. 2007;34(10):829–833
192. Warner L, Macaluso M, Newman D, et al. Condom effectiveness for prevention of *C trachomatis* infection. *Sex Transm Infect*. 2006;82(3):265
193. Paz-Bailey G, Koumans EH, Sternberg M, et al. The effect of correct and consistent condom use on chlamydial and gonococcal infection among urban adolescents. *Arch Pediatr Adolesc Med*. 2005;159(6):536–542
194. Niccolai LM, Rowhani-Rahbar A, Jenkins H, Green S, Dunne DW. Condom effectiveness for prevention of *Chlamydia trachomatis* infection. *Sex Transm Infect*. 2005;81(4):323–325
195. Weller S, Davis K. Condom effectiveness in reducing heterosexual HIV transmission. *Cochrane Database Syst Rev*. 2002;(1):CD003255
196. Martin ET, Krantz E, Gottlieb SL, et al. A pooled analysis of the effect of condoms in preventing HSV-2 acquisition. *Arch Intern Med*. 2009;169(13):1233–1240
197. Stanaway JD, Wald A, Martin ET, Gottlieb SL, Magaret AS. Case-crossover analysis of condom use and herpes simplex virus type 2 acquisition. *Sex Transm Dis*. 2012;39(5):388–393
198. Winer RL, Hughes JP, Feng Q, et al. Condom use and the risk of genital human papillomavirus infection in young women. *N Engl J Med*. 2006;354(25):2645–2654
199. Shew ML, Fortenberry JD, Tu W, et al. Association of condom use, sexual behaviors, and sexually transmitted infections with the duration of genital human papillomavirus infection among adolescent women. *Arch Pediatr Adolesc Med*. 2006;160(2):151–156
200. Koss CA, Dunne EF, Warner L. A systematic review of epidemiologic studies assessing condom use and risk of syphilis. *Sex Transm Dis*. 2009;36(7):401–405
201. American Academy of Pediatrics, Committee on Adolescence. Policy statement: condom use by adolescents. *Pediatrics*. 2013;132(5):973–981
202. Matson PA, Adler NE, Millstein SG, Tschann JM, Ellen JM. Developmental changes in condom use among urban adolescent females: influence of partner context. *J Adolesc Health*. 2011;48(4):386–390
203. Bearinger LH, Sieving RE, Duke NN, McMorris BJ, Stoddard S, Pettingell SL. Adolescent condom use consistency over time: global versus partner-specific measures. *Nurs Res*. 2011;60(suppl 3):S68–S78
204. Kenyon DB, Sieving RE, Jerstad SJ, Pettingell SL, Skay CL. Individual, interpersonal, and relationship factors predicting hormonal and condom use consistency among adolescent girls. *J Pediatr Health Care*. 2010;24(4):241–249
205. Manning WD, Flanigan CM, Giordano PC, Longmore MA. Relationship dynamics and consistency of condom use among adolescents. *Perspect Sex Reprod Health*. 2009;41(3):181–190
206. Ku L, Sonenstein FL, Pleck JH. The dynamics of young men's condom use

Downloaded from http://publications.aap.org/pediatrics/article-pdf/134/4/e1257/1100677/peds_2014-2300.pdf by Health Sciences Library@Orlando Health, Melanie Capobianco on 18 January 2022

during and across relationships. *Fam Plann Perspect*. 1994;26(6):246–251

207. Fortenberry JD, Tu W, Harezlak J, Katz BP, Orr DP. Condom use as a function of time in new and established adolescent sexual relationships. *Am J Public Health*. 2002;92 (2):211–213
208. Fine P, Mathé H, Ginde S, Cullins V, Morfesis J, Gainer E. Ulipristal acetate taken 48-120 hours after intercourse for emergency contraception. *Obstet Gynecol*. 2010;115(2 pt 1):257–263
209. Glasier AF, Cameron ST, Fine PM, et al. Ulipristal acetate versus levonorgestrel for emergency contraception: a randomised non-inferiority trial and meta-analysis. *Lancet*. 2010;375(9714):555–562
210. Glasier A, Cameron ST, Blithe D, et al. Can we identify women at risk of pregnancy despite using emergency contraception? Data from randomized trials of ulipristal acetate and levonorgestrel. *Contraception*. 2011;84(4):363–367
211. Rockoff JD. FDA reviewing efficacy of Plan B contraception in women over 165 pounds. *The Wall Street Journal*. November 25, 2013. Available at: http://online.wsj.com/news/articles/SB10001424052702304011304579220533719517944. Accessed January 15, 2014
212. Grimes DA. Switching emergency contraception to over-the-counter status. *N Engl J Med*. 2002;347(11):846–849
213. Committee on Adolescence. Emergency contraception. *Pediatrics*. 2012;130(6):1174–1182
214. Leung VW, Soon JA, Levine M. Measuring and reporting of the treatment effect of hormonal emergency contraceptives. *Pharmacotherapy*. 2012;32(3):210–221
215. Ellertson C, Ambardekar S, Hedley A, Coyaji K, Trussell J, Blanchard K. Emergency contraception: randomized comparison of advance provision and information only. *Obstet Gynecol*. 2001;98 (4):570–575
216. Meyer JL, Gold MA, Haggerty CL. Advance provision of emergency contraception among adolescent and young adult women: a systematic review of literature. *J Pediatr Adolesc Gynecol*. 2011;24(1):2–9
217. Bull SS, Posner SF, Ortiz C, Evans T. Knowledge of, attitudes toward, and stage of change for female and male condoms among Denver inner-city women. *J Urban Health*. 2003;80(4):658–666
218. Wilkinson D, Tholandi M, Ramjee G, Rutherford GW. Nonoxynol-9 spermicide for prevention of vaginally acquired HIV and other sexually transmitted infections: systematic review and meta-analysis of randomised controlled trials including more than 5000 women. *Lancet Infect Dis*. 2002;2(10):613–617
219. Today Sponge—Vaginal Contraceptive Sponge [consumer information leaflet]. Berkeley, CA: Myer Laboratories Inc; 2011. Available at: http://todaysponge.com/pdf/todaysponge-pi2.pdf. Accessed January 15, 2014
220. Vaughan B, Trussell J, Kost K, Singh S, Jones R. Discontinuation and resumption of contraceptive use: results from the 2002 National Survey of Family Growth. *Contraception*. 2008;78(4):271–283
221. Grimes DA, Gallo MF, Grigorieva V, Nanda K, Schulz KF. Fertility awareness-based methods for contraception. *Cochrane Database Syst Rev*. 2004;(4):CD004860
222. Whittaker PG, Merkh RD, Henry-Moss D, Hock-Long L. Withdrawal attitudes and experiences: a qualitative perspective among young urban adults. *Perspect Sex Reprod Health*. 2010;42(2):102–109
223. Bethell CD, Read D, Blumberg SJ, Newacheck PW. What is the prevalence of children with special health care needs? Toward an understanding of variations in findings and methods across three national surveys. *Matern Child Health J*. 2008;12(1):1–14
224. McRee AL, Haydon AA, Halpern CT. Reproductive health of young adults with physical disabilities in the U.S. *Prev Med*. 2010;51(6):502–504
225. Surís JC, Resnick MD, Cassuto N, Blum RW. Sexual behavior of adolescents with chronic disease and disability. *J Adolesc Health*. 1996;19(2):124–131
226. Murphy N. Sexuality in children and adolescents with disabilities. *Dev Med Child Neurol*. 2005;47(9):640–644
227. Neufeld JA, Klingbeil F, Bryen DN, Silverman B, Thomas A. Adolescent sexuality and disability. *Phys Med Rehabil Clin N Am*. 2002;13 (4):857–873
228. Worley G, Houlihan CM, Herman-Giddens ME, et al. Secondary sexual characteristics in children with cerebral palsy and moderate to severe motor impairment: a cross-sectional survey. *Pediatrics*. 2002; 110(5):897–902
229. Bauer J, Isojärvi JI, Herzog AG, et al. Reproductive dysfunction in women with epilepsy: recommendations for evaluation and management. *J Neurol Neurosurg Psychiatry*. 2002;73(2):121–125
230. Dizon CD, Allen LM, Ornstein MP. Menstrual and contraceptive issues among young women with developmental delay: a retrospective review of cases at the Hospital for Sick Children, Toronto. *J Pediatr Adolesc Gynecol*. 2005;18(3):157–162
231. American College of Obstetricians and Gynecologists Committee on Adolescent Health Care. ACOG Committee Opinion No. 448: Menstrual manipulation for adolescents with disabilities. *Obstet Gynecol*. 2009;114(6):1428–1431
232. Quint EH. Menstrual issues in adolescents with physical and developmental disabilities. *Ann N Y Acad Sci*. 2008;1135:230–236
233. Atkinson E, Bennett MJ, Dudley J, et al; Australian Society of Paediatric and Adolescent Gynaecology Working Party. Consensus statement: Menstrual and contraceptive management in women with an intellectual disability. *Aust N Z J Obstet Gynaecol*. 2003;43(2):109–110
234. Akers AY, Lynch CP, Gold MA, et al. Exploring the relationship among weight, race, and sexual behaviors among girls. *Pediatrics*. 2009;124(5). Available at: www.pediatrics.org/cgi/content/full/124/5/e913
235. Mond J, van den Berg P, Boutelle K, Hannan P, Neumark-Sztainer D. Obesity, body dissatisfaction, and emotional well-being in early and late adolescence: findings from the project EAT study. *J Adolesc Health*. 2011;48(4):373–378
236. Audet MC, Moreau M, Koltun WD, et al; ORTHO EVRA/EVRA 004 Study Group. Evaluation of contraceptive efficacy and cycle control of a transdermal contraceptive patch vs an oral contraceptive: a randomized controlled trial. *JAMA*. 2001;285(18): 2347–2354
237. Zieman M, Guillebaud J, Weisberg E, Shangold GA, Fisher AC, Creasy GW. Contraceptive efficacy and cycle control with the Ortho Evra/Evra transdermal system: the analysis of pooled data. *Fertil Steril*. 2002;77(2 suppl 2):S13–S18
238. Xu H, Wade JA, Peipert JF, Zhao Q, Madden T, Secura GM. Contraceptive failure rates of etonogestrel subdermal implants in overweight and obese women. *Obstet Gynecol*. 2012;120(1):21–26
239. Brunner Huber LR, Toth JL. Obesity and oral contraceptive failure: findings from the 2002 National Survey of Family Growth. *Am J Epidemiol*. 2007;166(11):1306–1311
240. Hormonal contraceptives for contraception in overweight or obese women. *Obstet Gynecol*. 2010;116(5):1206–1207
241. Gallo MF, Lopez LM, Grimes DA, Schulz KF, Helmerhorst FM. Combination contraceptives: effects on weight. *Cochrane Database Syst Rev*. 2008;(4):CD003987
242. Lopez LM, Edelman A, Chen M, Otterness C, Trussell J, Helmerhorst FM. Progestin-only contraceptives: effects on weight. *Cochrane Database Syst Rev*. 2013;(7): CD008815
243. Vickery Z, Madden T, Zhao Q, Secura GM, Allsworth JE, Peipert JF. Weight change at

Downloaded from http://publications.aap.org/pediatrics/article-pdf/134/4/e1257/1100677/peds_2014-2300.pdf by Health Sciences Library@Orlando Health, Melanie Capobianco on 18 January 2022

12 months in users of three progestin-only contraceptive methods. *Contraception*. 2013;88(4):503–508

244. American College of Obstetricians and Gynecologists. ACOG practice bulletin no. 105: Bariatric surgery and pregnancy. *Obstet Gynecol Clin North Am*. 2009;113(6):1306–1311
245. Tepper NK, Curtis KM, Jamieson DJ, Marchbanks PA; Centers for Disease Control and Prevention (CDC). Update to CDC's U.S. Medical Eligibility Criteria for Contraceptive Use, 2010: revised recommendations for the use of hormonal contraception among women at high risk for HIV infection or infected with HIV. *MMWR Morb Mortal Wkly Rep*. 2012;61(24):449–452
246. Panel on Antiretroviral Guidelines for Adults and Adolescents. Guidelines for the use of antiretroviral agents in HIV-1-infected adults and adolescents. Washington, DC: Department of Health and Human Services; 2011. Updated February 2013. Available at: www.aidsinfo.nih.gov/ContentFiles/AdultandAdolescentGL.pdf. Accessed January 15, 2014
247. Cupples SA. Cardiac transplantation in women. *Crit Care Nurs Clin North Am*. 1997;9(4):521–533
248. Laifer SA, Darby MJ, Scantlebury VP, Harger JH, Caritis SN. Pregnancy and liver transplantation. *Obstet Gynecol*. 1990;76(6):1083–1088
249. Shaben TR. Psychosocial issues in kidney-transplanted children and adolescents: literature review. *ANNA J*. 1993;20(6):663–668
250. Henning P, Tomlinson L, Rigden SP, Haycock GB, Chantler C. Long term outcome of treatment of end stage renal failure. *Arch Dis Child*. 1988;63(1):35–40
251. Melzer SM, Leadbeater B, Reisman L, Jaffe LR, Lieberman KV. Characteristics of social networks in adolescents with end-stage renal disease treated with renal transplantation. *J Adolesc Health Care*. 1989;10(4):308–312
252. Morel P, Almond PS, Matas AJ, et al. Long-term quality of life after kidney transplantation in childhood. *Transplantation*. 1991;52(1):47–53
253. Ghahramani N, Behzadi A, Gholami S, et al. Postrenal transplant improvement of sexual function. *Transplant Proc*. 1999;31(8):3144
254. O'Donnell D. Contraception in the female transplant recipient. *Dial Transplant*. 1986;15(11):610–612
255. Kim JH, Chun CJ, Kang CM, Kwak JY. Kidney transplantation and menstrual changes. *Transplant Proc*. 1998;30(7):3057–3059
256. Britto MT, Rosenthal SL, Taylor J, Passo MH. Improving rheumatologists' screening for alcohol use and sexual activity. *Arch Pediatr Adolesc Med*. 2000;154(5):478–483
257. Riely CA. Contraception and pregnancy after liver transplantation. *Liver Transpl*. 2001;7(11 suppl 1):S74–S76
258. Pietrzak B, Bobrowska K, Jabiry-Zieniewicz Z, et al. Oral and transdermal hormonal contraception in women after kidney transplantation. *Transplant Proc*. 2007;39(9):2759–2762
259. Paternoster DM, Riboni F, Bertolino M, et al. The contraceptive vaginal ring in women with renal and liver transplantation: analysis of preliminary results. *Transplant Proc*. 2010;42(4):1162–1165
260. Jabiry-Zieniewicz Z, Bobrowska K, Kaminski P, Wielgos M, Zieniewicz K, Krawczyk M. Low-dose hormonal contraception after liver transplantation. *Transplant Proc*. 2007;39(5):1530–1532
261. Deray G, Ie Hoang P, Cacoub P, Assogba U, Grippon P, Baumelou A. Oral contraceptive interaction with cyclosporin. *Lancet*. 1987;1(8525):158–159
262. Mastrobattista JM, Katz AR. Pregnancy after organ transplant. *Obstet Gynecol Clin North Am*. 2004;31(2):415–428, vii
263. Estes CM, Westhoff C. Contraception for the transplant patient. *Semin Perinatol*. 2007;31(6):372–377

Downloaded from http://publications.aap.org/pediatrics/article-pdf/134/4/e1257/1100677/peds_2014-2300.pdf by Health Sciences Library@Orlando Health, Melanie Capobianco on 18 January 2022