NCC Pediatrics Continuity Clinic Curriculum: **Adolescent I: Contraception**

Overall Goal:

Identify key adolescent health issues and become comfortable interviewing an adolescent.

Overall Outline:

Adolescent I:	***Adolescent II:***	***Adolescent III:***
Contraception	Menstrual Irregularities	Acne

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Pre-Meeting Preparation:

- "Contraception for Adolescents" *(PIR, 2013)*
- Monophasic & Multiphasic OCPs *(Tables 2&3 from PIR, 2008)*
  - WR-B Contraception Formulary List

Conference Agenda:

- Complete Adolescent I Quiz
- Complete Adolescent I Case Study
- Round Table: Contraception "Show & Tell" with Adolescent Providers

Post-Conference: *Board Review Q&A*

Extra Credit:

- AAP Adolescent Health Home: *includes policy statements, patient handouts, etc*
- Contraception & Adolescents: *AAP Policy Statement (2007)*
- Contraception for Adolescents: *AAP Technical Report (2014)*
- OCPs and Cancer Risk: FAQs: *Parent Resource*
- Methods of Adolescent Contraception: *Cheat Sheet (from previous module)*

Contraception for Adolescents

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Author Disclosure
Dr Upadhya has disclosed no financial relationships relevant to this article. This commentary does contain discussion of unapproved/investigative use of a commercial product/device.

Practice Gaps

1. Low use of highly effective contraception in the United States contributes to a teen pregnancy rate higher than other developed countries. Pediatricians can play an important role in educating adolescents and their parents about contraception.
2. Although intrauterine devices (IUDs) are the most widely used contraceptive method worldwide, use in the United States remains limited. Prompted by proven safety and superior efficacy, the American College of Obstetrics and Gynecology endorses IUDs as a first line contraceptive for all women, regardless of age and parity.
3. The American Academy of Pediatrics and the Society for Adolescent Health and Medicine both support over-the-counter access to emergency contraception (EC) for adolescents despite the fact that most pediatricians in practice do not routinely provide EC counseling.

Objectives

After completing this article, readers should be able to:

1. Identify, in order of effectiveness, the reversible methods of contraception that are approved by the US Food and Drug Administration (FDA) and available to adolescents in the United States.
2. Describe the 4 available methods of long-acting reversible contraceptives, including their duration of action, adverse effects, and contraindications of use.
3. Discuss the use of combined hormonal contraceptives, including effects on menstruation, absolute and relative contraindications to use, common adverse effects, and recent innovations, including progestin types and ultralow-dose pills.
4. Recognize common barriers to the use of effective contraceptives among adolescents.
5. Prescribe hormonal contraceptives and emergency contraceptives to adolescents.

Introduction

This afternoon you have an appointment with a 17-year-old girl who is a long-time patient. She comes to the visit with her mother and reports that she is here to find out about birth control options. She is previously healthy but has a history of dysmenorrhea and has heard that birth control might help with her periods. In addition, she recently disclosed to her mother that she had vaginal intercourse for the first time with her boyfriend. She reports that she used a condom, but she and her mother would like to know about other effective contraceptives.

This patient's concern is a common presentation to many practices caring for adolescents. Data from the Centers for Disease Control and Prevention (CDC) indicate that 43% of 15- to 19-year-old females report ever having had sexual intercourse. This percentage increases from early to late adolescence, when most young people report sexual intercourse. Dysmenorrhea is also a common concern among adolescents, with some studies suggesting that almost 90% of teens experience some degree of menstrual pain. Although nonsteroidal anti-inflammatory medications are the first-line treatment for dysmenorrhea, many hormonal contraceptives can significantly improve dysmenorrhea and reduce menstrual blood loss.

The percentage of female adolescents who report using contraception has increased during the past several decades. Most of the increase has been in the form of condoms, with

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68% of adolescents reporting condom use at first sex and 90% reporting ever having used condoms. The most recently available data from the CDC indicate that withdrawal has become the second most commonly used method of contraception among teens, with more than 57% reporting ever having used this method compared with 56% reporting ever having used the birth control pill. Less than 20% of female adolescents report use of the birth control pill, and smaller percentages report use of other hormonal contraceptives at first sex.

Low use of highly effective contraception is a major reason that the United States has a teen pregnancy rate that is higher than that of all other developed countries. Pediatricians, as the primary health care clinicians for adolescents, can play an important role in reducing adolescent pregnancies by educating adolescents and their parents about the most effective methods of contraception and encouraging initiation of highly effective methods.

This article reviews the most up-to-date information about the most highly effective, reversible methods of contraception available to adolescents, as defined by the CDC. These methods include long-acting reversible contraceptives (implants and intrauterine devices [IUDs]), injectable hormones, and hormone-containing pills, patch, or ring (**Figure**). Although these methods can be used only by young women, it is important that young men are also aware of available methods so that they can discuss options with their partners.

Long-Acting Reversible Contraceptives

There are currently 4 long-acting reversible contraceptive products available in the United States: 3 IUDs (2 levonorgestrel intrauterine systems [IUSs] and the copper IUD) and 1 subdermal implant. These methods represent the most effective, reversible contraceptives available for women, including adolescents, with fewer than 1 of 100 women expected to become pregnant in a year of use.

Intrauterine Contraceptives

Although the IUD is the most widely used contraceptive method worldwide, use in the United States remains limited, particularly among young women. Myths about the safety of the IUD and about restrictions on use in nulliparous women have contributed to low rates of use. In fact, studies on an older generation of IUD, the Dalkon Shield, have been reexamined and found to contain methodologic flaws that overestimated the risk of infection with the IUD. Data on the current generation of IUDs demonstrate that the devices do not cause pelvic inflammatory disease. Although there is an increased risk of pelvic infection from IUD insertion, the absolute risk of infection is low (<1%) and only exists within the first 3 weeks of insertion. Similarly, it is now clear that IUDs do not cause infertility, and, in fact, return to fertility is rapid after IUD removal. This new information on safety combined with superior efficacy has prompted several groups, including the American College of Obstetrics and Gynecology, to endorse IUDs as a first-line contraceptive for all women, regardless of age and parity.

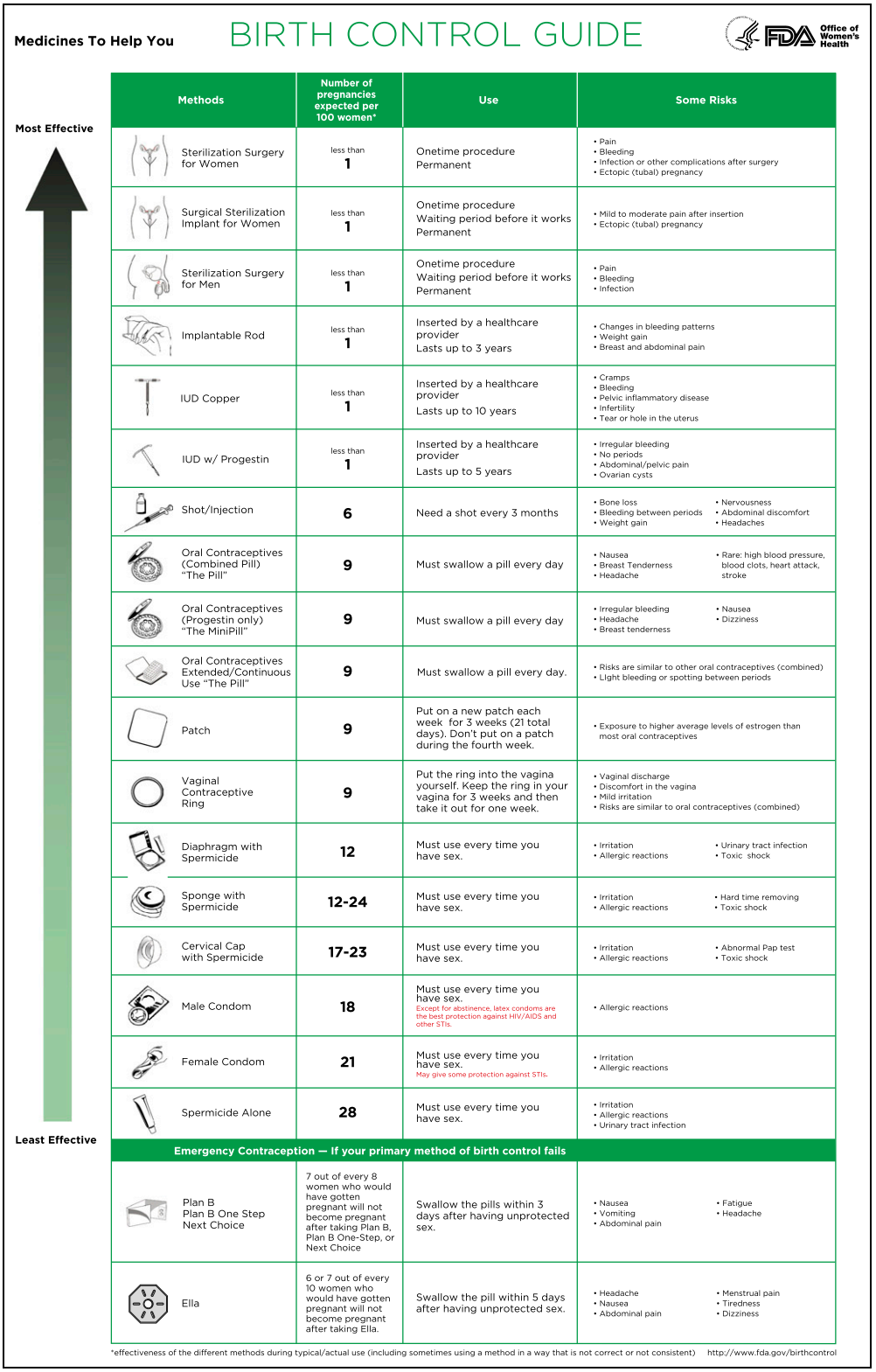
METHODS AND USE. The 3 intrauterine contraceptives available in the United States are the levonorgestrel IUSs Mirena R and Skyla R (both from Bayer Healthcare Pharmaceuticals Inc, Wayne, NJ) and the copper-containing Paraguard R (Teva Women's Health Inc, Sellersville, PA). The Mirena IUS was approved by the US Food and Drug Administration (FDA) in 2000 for contraception and specifically approved for treatment of heavy periods in 2009. Mirena releases 20 μg/d of levonorgestrel initially and is effective for contraception for up to 5 years. The method works through changes in the cervical mucus and atrophy of the endometrial lining. It may also inhibit ovulation.

Skyla is the newest levonorgestrel IUS on the market and releases approximately 14 μg/d of levonorgestrel. Its mechanism of action is the same as Mirena; however, it is only approved for use for up to 3 years.

The Paraguard IUD was approved by the FDA in 1984 and has been marketed in the United States since 1988. The method contains no hormones, which is appealing to some women. The Paraguard releases a small amount of copper during the duration of its use (up to 10 years). The mechanism of action is primarily through inhibition of sperm migration. Paraguard does not have effects on ovulation.

Any of the IUDs can be inserted during an office visit. The relatively simple procedure involves a bimanual examination to verify the size and position of the uterus, speculum insertion, sterile sounding (insertion of a rod called a sound through the cervix that determines the depth of the uterine cavity) to verify appropriate size of the uterus, and sterile insertion of the device through the cervix. Online videos demonstrating the insertion procedure for each device are available from the manufacturers.

CONTRAINDICATIONS AND ADVERSE EFFECTS. Contraindications to the use of an IUD include current pregnancy; pelvic inflammatory disease or puerperal or postabortion sepsis that is current or within the prior 3 months; current sexually transmitted infection or purulent cervicitis; undiagnosed abnormal vaginal bleeding; malignant tumor of the genital tract; and anatomical abnormalities of the uterine cavity that prevent insertion or



Medicines To Help You

BIRTH CONTROL GUIDE

Office of Women's Health

Most Effective

Least Effective

Methods	Number of pregnancies expected per 100 women*	Use	Some Risks
Sterilization Surgery for Women	less than 1	Onetime procedure Permanent	• Pain • Bleeding • Infection or other complications after surgery • Ectopic (tubal) pregnancy
Surgical Sterilization Implant for Women	less than 1	Onetime procedure Waiting period before it works Permanent	• Mild to moderate pain after insertion • Ectopic (tubal) pregnancy
Sterilization Surgery for Men	less than 1	Onetime procedure Waiting period before it works Permanent	• Pain • Bleeding • Infection
Implantable Rod	less than 1	Inserted by a healthcare provider Lasts up to 3 years	• Changes in bleeding patterns • Weight gain • Breast and abdominal pain
IUD Copper	less than 1	Inserted by a healthcare provider Lasts up to 10 years	• Cramps • Bleeding • Pelvic inflammatory disease • Infertility • Tear or hole in the uterus
IUD w/ Progestin	less than 1	Inserted by a healthcare provider Lasts up to 5 years	• Irregular bleeding • No periods • Abdominal/pelvic pain • Ovarian cysts
Shot/Injection	6	Need a shot every 3 months	• Bone loss • Bleeding between periods • Weight gain • Nervousness • Abdominal discomfort • Headaches
Oral Contraceptives (Combined Pill) "The Pill"	9	Must swallow a pill every day	• Nausea • Breast Tenderness • Headache • Rare: high blood pressure, blood clots, heart attack, stroke
Oral Contraceptives (Progestin only) "The MiniPill"	9	Must swallow a pill every day	• Irregular bleeding • Headache • Breast tenderness • Nausea • Dizziness
Oral Contraceptives Extended/Continuous Use "The Pill"	9	Must swallow a pill every day.	• Risks are similar to other oral contraceptives (combined) • Light bleeding or spotting between periods
Patch	9	Put on a new patch each week for 3 weeks (21 total days). Don't put on a patch during the fourth week.	• Exposure to higher average levels of estrogen than most oral contraceptives
Vaginal Contraceptive Ring	9	Put the ring into the vagina yourself. Keep the ring in your vagina for 3 weeks and then take it out for one week.	• Vaginal discharge • Discomfort in the vagina • Mild irritation • Risks are similar to oral contraceptives (combined)
Diaphragm with Spermicide	12	Must use every time you have sex.	• Irritation • Allergic reactions • Urinary tract infection • Toxic shock
Sponge with Spermicide	12-24	Must use every time you have sex.	• Irritation • Allergic reactions • Hard time removing • Toxic shock
Cervical Cap with Spermicide	17-23	Must use every time you have sex.	• Irritation • Allergic reactions • Abnormal Pap test • Toxic shock
Male Condom	18	Must use every time you have sex. Except for abstinence, latex condoms are the best protection against HIV/AIDS and other STIs.	• Allergic reactions
Female Condom	21	Must use every time you have sex. May give some protection against STIs.	• Irritation • Allergic reactions
Spermicide Alone	28	Must use every time you have sex.	• Irritation • Allergic reactions • Urinary tract infection
Emergency Contraception — If your primary method of birth control fails			
Plan B Plan B One Step Next Choice	7 out of every 8 women who would have gotten pregnant will not become pregnant after taking Plan B, Plan B One-Step, or Next Choice	Swallow the pills within 3 days after having unprotected sex.	• Nausea • Vomiting • Abdominal pain • Fatigue • Headache
Ella	6 or 7 out of every 10 women who would have gotten pregnant will not become pregnant after taking Ella.	Swallow the pill within 5 days after having unprotected sex.	• Headache • Nausea • Abdominal pain • Menstrual pain • Tiredness • Dizziness

*effectiveness of the different methods during typical/actual use (including sometimes using a method in a way that is not correct or not consistent) http://www.fda.gov/birthcontrol

Figure. US Food and Drug Administration birth control guide. Available at: http://www.fda.gov/ForConsumers/ByAudience/ForWomen/WomensHealthTopics/ucm117971.htm.

allergy to an IUD component. Wilson disease is also a contraindication to use of the copper-containing IUD.

Risks of IUD placement that are common to the copper and hormonal IUD include pain, insertion-associated infection, and the possibility of uterine perforation. Dilation of the cervix during insertion can also result in vasovagal reactions in some women. Expulsion of the IUD after placement can occur and is more common among young women.

Adverse effects of the copper IUD include increased menstrual bleeding and spotting and menstrual pain. These adverse effects are the most common reason for discontinuation of the copper IUD. By contrast, the levonorgestrel-containing IUDs decrease menstrual flow and dysmenorrhea. By the end of the first year of use, approximately 20% of women using the Mirena-containing IUD will experience amenorrhea. By contrast, only approximately 6% will experience amenorrhea after 1 year of Skyla use, but 20% will experience infrequent bleeding (1 or 2 bleeding or spotting episodes in 90 days). Any of the IUDs may be removed at any time after insertion if the patient desires to become pregnant or an alternative method of contraception.

ACCESS TO IUDS FOR ADOLESCENTS. Barriers to IUD use among adolescents include concerns about safety, as noted previously, and many clinicians and women may still not be familiar with newer guidelines and safety data. Another significant barrier to use of the IUD is cost. Although studies have found the devices to be cost-effective over time given their long duration of action, the initial costs can be significant (approximately $500-$1,000). Although the Affordable Care Act is set to require all insurance plans to cover all FDA-approved contraceptives as of 2013, current coverage varies greatly by insurance plan.

Pediatricians can play a role in increasing the use of IUDs by educating themselves and their patients about this method. In addition, pediatricians should familiarize themselves and establish relationships with clinicians in their communities who place IUDs in young women, particularly those who work at clinics that provide them at low or no cost through Title X funding.

Subdermal Implant

Another category of long-acting reversible contraceptive available in the United States is the subdermal implant (sold under the brand names Implanon R and Nexplanon R [Merck and Co Inc, Whitehouse Station, NJ]). This method consists of a 4-cm, single rod that is placed just under the skin on the medial aspect of the upper arm. The implant releases 60 μg/d of the progestin etonorgestrel. The hormone works to suppress ovulation and thicken cervical mucus and leads to an atrophic endometrium. Both Implanon and Nexplanon are pharmacologically equivalent; however, Nexplanon, the more recent option, was modified to be radio-opaque and to have an easier applicator. These changes were designed to facilitate subdermal insertion and to verify location of the device. Once all previously trained Implanon clinicians have completed Nexplanon training, Implanon use will be discontinued.

USE AND PLACEMENT. The subdermal implant is placed during an office visit with use of local anesthetic and has a maximum duration of action of 3 years. Removal of the rod can be performed at any time and involves a small incision. If a woman wishes to continue use of the implant after 3 years, a new one can be placed immediately after removal of the previous implant through the same incision. Return to fertility is rapid after the implant is removed. Clinicians must go through company-sponsored training to prescribe the hormonal implant, and training can be requested from Merck.

CONTRAINDICATIONS AND ADVERSE EFFECTS. Use of the hormonal implant is contraindicated for women who are pregnant or who have a progestin sensitive cancer, liver disease, or allergy to a product component. Complications of the insertion may include pain, infection, and bleeding. If placed correctly, removal should be relatively straightforward; however, removal may be complicated by scar tissue or deep insertion. Women who have weight greater than 130% of ideal body weight or who are using liver enzyme–inducing medications may have reduced efficacy of the hormonal implant.

The main adverse effect of the implant is irregular bleeding, and this adverse effect is the most common reason that women decide to discontinue use of the implant. Additional adverse effects are similar to other progestin-only methods, including headache, acne, and weight gain. The wholesale cost of the Nexplanon rod is reported at approximately $650. As with the intrauterine contraceptives, the Affordable Care Act may improve insurance coverage of implants under Women's Preventive Health Services, but current coverage may vary and clinicians should explore low-cost sites, such as Title X clinics, in their communities.

Progestin-Only Injectable Contraception

The second most commonly used hormonal contraceptive by US teens is injectable medroxyprogesterone

(Depo-Provera; Pfizer, New York, NY). Injectable medroxyprogesterone was initially approved by the FDA in 1992 in an intramuscular form and is currently also available as a subcutaneous injection. The duration of action of the injection is 3 months. Like other progestin-only methods, medroxyprogesterone works by inhibiting ovulation, thickening the cervical mucus, and inducing an atrophic endometrium. Although under conditions of perfect use, medroxyprogesterone has an estimated pregnancy risk of less than 1%, the typical use rate is 3%. Although Depo-Provera has no effect on long-term fertility, its effects are not as immediately reversible as those of other hormonal methods. It may take up to 9 months for a return to ovulation after discontinuation.

The excellent efficacy and 3-month mechanism of action are some of the major advantages of the injectable when compared with oral contraceptives, patch, or ring. In addition, the method is undetectable and therefore a good choice for young women seeking a private method. Compared with estrogen-containing methods, medroxyprogesterone does not interact with many other drugs and is a good choice for teens with contraindications to estrogen or who have chronic conditions that require medications that are enzyme inducers, including antiepileptics and antiretrovirals. Some evidence suggests that medroxyprogesterone may also reduce the frequency of grand mal seizures and sickle cell crises.

Adverse Effects and Black Box Warning

Unfortunately, the progestin-only injectable contraceptive also has properties that are not acceptable to some teens. The most commonly reported adverse effect of the medroxyprogesterone injection is menstrual irregularity. This may take the form of irregular bleeding, but most patients will experience amenorrhea. This makes medroxyprogesterone a good choice for some young women who are experiencing very heavy bleeding but not as good for young women who are uncomfortable about not having periods. Making sure that teens are aware of the likely menstrual changes before starting use of medroxyprogesterone may improve their satisfaction with the method.

The 2 other most cited concerns about medroxyprogesterone are weight gain and effects on bone mineral density. According to the FDA labeling for the product, women gain an average of 5 lb in the first year of use and 8 lb in the first 2 years. Whether this weight gain is caused by the medication is not clear; however, young women who are concerned about weight gain may not be the best candidates for this method.

In 2004, the FDA added a black box warning to medroxyprogesterone, indicating that use may be associated with decrease in bone mineral density. This warning was based on data from a controlled, prospective study of women indicating reduction in spine and hip bone density and prospective observational data from adolescents. On the other hand, other prospective studies have also found that bone mineral density is regained after discontinuation. No data exist to link use of medroxyprogesterone with increased risk of fractures. The Society for Adolescent Health and Medicine issued a policy statement indicating that medroxyprogesterone is a highly effective contraceptive and that for most adolescents the benefits outweigh the risks associated with loss of bone mineral density. Young women and their families should be made aware of the black box warning and should be counseled to ensure they receive adequate calcium and vitamin D through diet or supplementation.

Combined Hormonal Contraceptives

This category of contraceptives includes combined oral contraceptives (COCs) commonly referred to as the pill (Ortho Evra R patch; Jansenn Pharmaceuticals, Titusville, NJ; and Nuva Ring R; Merck and Co Inc). Although the specific formulations within this category vary, they all contain a combination of estrogen and progestin and, therefore, contain a core set of similar mechanism of action, adverse effects, and benefits, which will be reviewed subsequently with additional comments relating to the particulars of each method.

Compared with the long-acting reversible contraceptives and the injectable option, the combined hormonal methods require more frequent dosing and have lower contraceptive efficacy under typical use conditions. If used perfectly, these methods have a failure rate of less than 1%; however, typical use failure rates are approximately 8% and may be higher in some women, including teens. Studies have found that even among teens who report that they are consistent users of the pill, missed doses are common, and many episodes of intercourse are unprotected.

Combined hormonal contraceptives work primarily through inhibition of ovulation and thickening of the cervical mucus. The estrogen component can improve cycle control, and COCs are first-line therapy for endometriosis and provide improvement in dysmenorrhea.

Contraindications and Adverse Effects

Adverse effects of combined hormonal methods include spotting, nausea, breast tenderness, and bloating, which

often improve after 3 cycles of use. Although many young women report hearing that birth control pills will cause them to gain weight, data do not indicate any consistent weight gain associated with use of combined hormonal contraceptives. Metabolism of other medications, such as anticonvulsants, may be affected by the estrogen component of combined hormonal contraceptives.

The main serious risk associated with the use of combine hormonal contraceptives is venous thromboembolism (VTE). This risk remains lower among general users of combined hormonal methods than among pregnant women. On the other hand, women, including teens, who have a history of VTE should not use combined hormonal contraceptives. Other absolute contraindications to combined hormonal contraceptive use include known thrombogenic mutations, migraine headaches with focal aura, uncontrolled hypertension (systolic blood pressure >160 mm Hg or diastolic blood pressure >100 mm Hg), hepatocellular disease, and breast or liver cancer.

All women who are using a combined hormonal contraceptive must be counseled on the risk of VTE. They should also be advised about symptoms of VTE to watch out for and counseled to seek medical care if any of the symptoms occur. The symptoms can be presented to the patient with the easily memorized acronym ACHES: abdominal pain, chest pain, headaches, eye problems, and severe leg pain.

Combined hormonal contraceptives are also associated with a number of other health benefits. These benefits include reduction in dysmenorrhea and menstrual blood loss, improvement in acne, reduced free testosterone level, reduced risk of endometrial and ovarian cancers, and reduced risk of benign breast conditions.

Combined Oral Contraceptives

As noted earlier, the pill is the most commonly used hormonal contraceptive method among US teens. This is likely because of the overwhelming familiarity of the method in the general public and among clinicians, as well as the ease of administration and prescription. To be most effective, the pill requires daily dosing. Teens who know that remembering a daily medication will be difficult for them should be encouraged to choose a different method. Those who want this method should be counseled about strategies to facilitate daily dosing, including adding it to another daily routine that is well established (eg, brushing teeth) and/or using technological reminders, such as cell phone alarms, apps, or text messages. Some Internet sites, including bedsider.org, provide text message reminder services.

CHOOSING AND STARTING USE OF A BIRTH CONTROL PILL. One of the main issues facing clinicians today with regard to the pill is navigating through the many available choices. Advances in the past several years have taken the form of new progestins, lower-dose estrogen formulations, and modifications to the cycle, such as 24-4 and extended cycle regimens. For most young women starting use of the pill, however, a monophasic pill with 30 or 35 μg of estrogen and a second-generation progestin such as levonorgestrel are good choices. Pediatricians should become familiar with 1 or 2 of these pills and their equivalents and use these as their primary starting choice. If a patient experiences adverse effects, such as bloating, nausea, or frequent spotting that does not improve after 3 months, an alternative pill can be selected with change in estrogen dose or progestin type to address the adverse effects.

Some common myths about starting use of the pill relate to the need for a pelvic examination and a Sunday or first day of menstrual cycle start date. In fact, a pelvic examination is not a requirement to starting use of the pill. Teens and their families should be educated that Papanicolaou smear screening for cervical cancer should begin at age 21 years. Chlamydia screening should be performed annually for all sexually active women younger than 25 years, regardless of number of sexual partners. Chlamydia screening may be performed through urine, vaginal, or cervical sampling.

Pills (and other hormonal methods) can be initiated at any point in the menstrual cycle. Patients should be counseled, however, that starting use of pills at a time outside the first 5 days of the cycle means that the method will not be effective immediately. Patients need to use another method for pregnancy prevention for at least the first 7 days after beginning. Starting use of the pill on the day of the office visit, regardless of timing within the menstrual cycle, is known as quick start. This strategy has been reported to improve initiation of contraception, although long-term continuation does not appear to be different compared with those with usual start times.

DROSPIRENONE- AND DESOGETREL-CONTAINING PILLS. During the past decade newer classes of progestins have been developed with low androgenic profiles that aim to reduce clinical symptoms of acne, bloating, and hirsutism. One of these progestins, drospirenone, can be found in the pills Yasmin R, Yaz R, and Beyaz R (all from Bayer Healthcare Pharmaceuticals Inc), along with their generics where available. Beyaz is the newest of these drospirenone-containing pills, differs from Yaz by the addition of folate to the active and inactive pills,

and can be indicated for women who want to get their daily folate supplementation in their birth control pill. Whether this is clinically superior to advising a patient to take a multivitamin is not clear.

In May 2011, the FDA issued a safety announcement indicating that it was reviewing data on the potential increased risk of VTE related to drospirenone-containing contraceptives. After completing its review of epidemiologic studies, the FDA issued a label change in April 2012 indicating that pills containing drospirenone may be associated with a 1.5 to 3 times greater risk of VTE compared with levonorgestrel-containing pills. They caution that the studies reviewed did not contain enough information about baseline risk of participants to allow a causal link to be drawn between the drospirenone-containing pills and increased VTE risk. The risk of VTE among users of these pills remains lower than that among pregnant women. Clinicians should make patients aware of this potential risk and weigh it against the patients' risk profile and clinical indications for using the contraceptive pill.

Similar concerns have been raised regarding third-generation progestins, including desogestrel; however, the FDA has not made any label changes to desogestrel-containing products.

ULTRALOW-DOSE ESTROGEN PILLS. Pill formulations containing 30 to 35 μg of ethinyl estadriol are considered low dose; however, newer formulations have come onto the market containing 20 μg or less. The lowest-dose pill currently marketed contains only 10 μg of estrogen (Lo Loestrin; R Warner Chilcott, Rockaway, NJ).

One concern about use of very low-dose pills (≤20 μg) in adolescents is effects on bone mineral density. At least one study has found that adolescent users of low-dose pills had a reduction in physiologic acquisition of bone mineral density compared with nonusers and users of 30-μg pills. The actual effect of this difference on fracture risk is not known.

A Cochrane review has found that users of ultralow-dose pills had higher rates of menstrual irregularity and discontinuation of this method compared with those using pills with greater than 20 μg of estrogen. These data, combined with potential bone density concerns, support use of pills containing 30 to 35 μg as first line in new users of COCs.

CYCLE INNOVATIONS. The final innovation in the COC market that pediatricians should be aware of is changes to the cycling of the active drug (ie, the hormone composition or number of active vs inactive pills during the days of the pack). Some pills are marketed as biphasic or triphasic pills, meaning that the progesterone dose changes during the cycle. This is in contrast to monophasic pills, which contain the same amount of hormone throughout the cycle. There is little evidence to support any clinical difference between these cycle preparations. Anyone who has tried to counsel patients regarding what to do about missed pills, however, knows that triphasic pills certainly make that counseling more challenging.

Other changes to the cycle have to do with the number of active vs hormone-free pills. Although traditional pills were made to have 21 active and 7 hormone-free intervals, a newer trend is to move toward shorter hormone-free intervals to further reduce discomfort associated with withdrawal bleeds. These are often designed as 24-4 cycles, with 2 of the 4 containing a very low dose of estrogen and 2 containing no hormone. In addition, some formulations may include iron in the placebo pills; however, the clinical significance of these has not been demonstrated.

Finally, several products are now on the market as extended-cycle formulations. These include 84-7 formulations that give the user 4 periods a year. These formulations may be associated with increased breakthrough bleeding that often decreases with time. If specially packaged extended-cycle regimens are unavailable, any other COCs can be used in the same way by eliminating the hormone-free pills for 3 cycles and then taking the hormone-free week at the end of the fourth cycle of pills.

Transdermal Contraception

The transdermal contraceptive patch Ortho Evra R (Jansenn Pharmaceuticals) was originally approved by the FDA in 2001. The patch contains 20 μg of ethinyl estradiol and 15 μg of the progestin norelgestromin. The patch is placed on the body and changed weekly for 3 weeks, followed by a 1-week patch-free interval. This innovation is designed to increase adherence to the regimen compared with need for daily dosing of the pill.

ADVERSE EFFECTS. Because the patch results in a more prolonged steady state of estrogen level in the body, some users may notice more estrogen-related adverse effects, including nausea. In addition to the adverse effects common to the pill, the patch can cause local skin irritation at the site of use.

The prolonged steady state of estrogen in the patch has also raised the concern of potential increased risk of VTE. Two large epidemiologic studies evaluated that risk and found conflicting reports, with one showing increased risk of VTE compared with a 35-μg pill and the other showing no increased risk. After reviewing these studies in November 2011, the FDA issued a label

change for the patch, indicating that there *may* be an increased risk of VTE.

Intravaginal Hormonal Contraception

The final combined hormonal method currently marketed in the United States is intravaginal ring (NuvaRing R; Merck and Co Inc), also approved by the FDA in 2001. The flexible, latex-free ring contains ethinyl estradiol and the progestin etonorgestrel. Its duration of action is 1 month. Users can elect to place the ring intravaginally for 3 weeks and remove it for 1 hormone-free week to stimulate a typical 28-day cycle. An alternate, off-label dosing schedule allows users to use the ring continuously by leaving it in place for a month and replacing it monthly on the same day (eg, removing one ring and replacing with another on the first of every month). This continuous use regimen may reduce pelvic pain and may be a good choice for young women with particularly painful periods.

In addition to the adverse effects common to all combined hormonal methods, ring contraception may cause local vaginal irritation or discharge. A few sexual partners of contraceptive ring users report that they can feel the ring during intercourse. It is also possible for the ring to fall out, and users are instructed to clean the ring with water and reinsert it. If it is left out for more than 3 hours, a backup method of contraception should be used for the following week.

INSERTION AND REMOVAL. One of the main factors that limit use of the ring among adolescents is the need to insert and remove the ring. This requires a level of comfort with one's body that is often lacking, particularly among younger adolescents. A good initial screening question for this is whether the adolescent uses tampons. For those familiar with tampon use, insertion of the ring is similar. Users can remove a tampon from its applicator and place the ring in the empty applicator. The ring can then be inserted just as they would insert a tampon. Removal of the ring, however, requires inserting a finger into the vagina to hook the ring and pull it out. Adolescents who are uncomfortable with this procedure should be encouraged to choose an alternative method.

Progestin-Only Pills

Teens who desire an oral contraceptive but have a contraindication to estrogen can be prescribed progestin-only pills. These pills work the same way as other progestin-only methods by suppressing ovulation and thickening cervical mucus. The pills are taken continuously with no pill-free intervals.

Progestin-only pills are sensitive to timing of dose, and missing or delaying doses is likely to result in breakthrough bleeding and method failure. Adolescents using this method must be vigilant about adherence.

Emergency Contraception

Emergency contraception (EC) is defined as a method that can be used after unprotected sex to reduce the risk of pregnancy. In the United States, available methods include levonorgestrel, ulipristal acetate (ella R; Watson Pharma Inc), and insertion of the copper IUD. In addition, some combined oral contraceptives can be taken in increased doses, a regimen known as the Yuzpe method (http://ec.princeton.edu/questions/dose.html). The Yuzpe method can be started up to 72 hours after unprotected sex, however effectiveness may decrease during that time.

Specifically packaged products containing a total dose of 1.5 mg of levonorgestrel for EC are available as Plan B R R (Teva Women's Health Inc, Sellersville, PA), Plan B One Step R R (Teva Women's Health Inc), and Next Choice R (Watson Pharma Inc). Although labeling on the packages of Plan B and Next Choice indicate that two 0.75-mg doses should be taken 12 hours apart, studies have found that both doses can be taken together to increase adherence. The label also indicates that the product should be taken within 72 hours of unprotected intercourse, but other studies have found that it may be effective up to 120 hours.

The levonorgestrel method of EC works primarily through inhibition of ovulation. Adverse effects include nausea and abdominal pain, although these occur in a few patients. Although known pregnancy is a contraindication to use of levonorgestrel because it makes use of the method unnecessary, levonorgestrel will not disrupt an established pregnancy. Clinicians therefore should feel comfortable prescribing levonorgestrel over the telephone or providing patients with advanced prescriptions to use in case of future need.

The landscape of nonprescription access to levonorgestrel EC has been in flux for a number of years and is likely to continue to change in the near future. Recent changes were prompted by a federal court order that Plan B and generic equivalents be made available over the counter without age restriction. The US Justice Department has appealed this ruling, and as of June 20, 2013, the FDA has approved sale of Plan B One Step without a prescription without an age restriction. Plan B and Next Choice currently remain available without a prescription for those 17 years and older. In 9 states (Alaska, California, Hawaii, Maine, Massachusetts, New Hampshire, New Mexico,

Vermont, and Washington) EC is available without a prescription regardless of age under some circumstances. Studies have found that not all pharmacies stock EC or may limit access to teens, so pediatricians should be aware of pharmacies in their communities where teens can access EC if needed. In its most recent EC policy statement released in December 2012, the American Academy of Pediatrics reaffirmed its support of over-the-counter access to levonorgestrel EC regardless of age. The most up-to-date information on regulatory status of EC by state can be found at www.guttmacher.org.

Ulipristal acetate (30 mg) is the newest dedicated EC product available on the market in the United States. It is approved for use up to 120 hours after unprotected intercourse. Labeling indicates that pregnancy should be excluded before use of ulipristal acetate. Adolescents should be advised to retake the medication if they vomit within 3 hours of taking the drug. Ulipristal acetate is a progestin receptor agonist and antagonist, and its mechanism of action is also primarily inhibition of ovulation. The most common adverse effects of ulipristal acetate include headache, nausea, and abdominal pain. Ectopic pregnancy can occur, so users should be advised to seek care for severe abdominal pain after use. Ulipristal acetate is only available with a prescription.

Awareness and access to EC methods are important for all teens given their reliance on methods such as condoms, withdrawal, and combined hormonal methods, which are all user dependent. In addition, nearly 10% of teens report nonconsensual sex where EC may be needed. The American Academy of Pediatrics and the Society for Adolescent Health and Medicine both support over-the-counter access to EC for adolescents and encourage clinicians to counsel all adolescents about the method at routine and reproductive health visits. Despite these recommendations, studies have found that most pediatricians in practice and training do not routinely provide EC counseling.

Additional Counseling Points

No matter which of the methods of contraception adolescents choose, it is imperative that they be made aware that the method will not protect them against sexually transmitted infections (STIs), including chlamydia and human immunodeficiency virus. Pediatricians must counsel patients that abstinence is the only 100% foolproof method for protecting oneself from pregnancy and STIs. If they choose to engage in intercourse, condoms must be used 100% of the time for protection against STIs.

It is also important for adolescents to be aware that there are many options for contraception available and that if the one they start with ends up not being what they want, they can try something else. For the 17-year-old patient, described at the beginning of this article, there is a need for protection from pregnancy, but there is also a concern about painful periods. A hormonal IUD, combined hormonal method, or injectable all have the potential to serve both needs. She may initially feel more comfortable with one option over another but may find the experience with the initial method to be unsatisfactory. Making sure she is aware of other potential options up front and that you can easily help her switch will increase the chances that she will seek early consultation instead of just discontinuing her method.

If a pediatrician is not comfortable discussing options and/or prescribing contraception, it is important that he/she disclose that to adolescents and their families and ensure that they are referred to another practitioner who will provide that service. That referral may include another pediatrician in the practice or another clinician in the community, but the primary pediatrician should ensure that the referral does not place a significant barrier to obtaining needed services. If low cost or confidential services cannot be provided in the practice, Title X clinicians in the community can be an important resource with which pediatricians should be familiar.

One final thing to keep in mind when talking to adolescents about birth control is that most teens want to have children at some time in their lives. It can be useful to acknowledge that desire and then help them think more about when they think is the right time to have a child and what type of birth control method can help protect them until that time.

Summary

- On the basis of strong evidence, epidemiologic studies indicate that most adolescents will have intercourse by age 19 years and up to 10% may experience unwanted sexual activity.
- On the basis of strong evidence, nearly 850,000 pregnancies occur annually among teenagers, and most of these are due to lack or incorrect use of contraception.
- On the basis of strong evidence, evidence indicates that IUDs and implants are the most effective, reversible methods of contraception available.
- On the basis of strong evidence, evidence indicates that contraceptives, including hormonal IUD, combined hormonal methods and progestin-only injectables, and pills, can improve menstrual cycle dysfunction, including heavy, painful, and irregular menses.

- **The Centers for Disease Control and Prevention has established medical eligibility for all methods of contraception and is an excellent reference to determine whether a medical condition is a contraindication to use of a contraceptive method.**
- **Pediatricians play an important role in helping adolescents choose and access methods of contraception that are best for them.**

Recommended Online Resources for Contraceptive Counseling

http://bedsider.org/: Website developed by the National Campaign to Prevent Teen and Unplanned Pregnancy; contains information on all methods of contraception from abstinence to sterilization and includes videos of real women discussing their experiences with contraceptive methods.

http://ec.princeton.edu/: Website operated by the Office of Population Research at Princeton University; provides comprehensive information about emergency contraception methods and helps women locate clinicians.

https://locator.aids.gov?feeds=opa&skin=opa: Website maintained by the Federal Office of Population Affairs; provides location specific information about Title X Family Planning Clinics.

Suggested Reading

American Academy of Pediatrics Committee On Adolescence. Emergency contraception. *Pediatrics*. 2012;130(6):1174–1182

American College of Obstetricians and Gynecologists. Adolescents and long-acting reversible contraception: implants and intrauterine devices. Committee Opinion No. 539. *Obstet Gynecol*. 2012;120:983–988

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Woods JL, Shew ML, Tu W, Ofner S, Ott MA, Fortenberry JD. Patterns of oral contraceptive pill-taking and condom use among adolescent contraceptive pill users. *J Adolesc Health*. 2006;39(3):381–387

Parent Resources From the AAP at HealthyChildren.org

The reader is likely to find material relevant to this article to share with parents by visiting these links:

- English: http://www.healthychildren.org/English/ages-stages/teen/dating-sex/Pages/Emergency-Contraception.aspx
- Spanish: http://www.healthychildren.org/spanish/ages-stages/teen/dating-sex/paginas/emergency-contraception.aspx
- English only: http://www.healthychildren.org/English/ages-stages/teen/dating-sex/Pages/Birth-Control-for-Sexually-Active-Teens.aspx

Table 2. Monophasic Oral Contraceptives

Estrogen	Progestin	Brand Names
50 mcg mestranol	1 mg norethindrone	Necon 1/50[a] Norinyl 1+50[a]
50 mcg ethinyl estradiol	1 mg norethindrone	Ovcon-50[b]
50 mcg ethinyl estradiol	1 mg ethynodiol diacetate	Zovia 1/50E[a]
50 mcg ethinyl estradiol	0.5 mg norgestrel	Ovral[c] Ogestrel 0.5/50[a]
35 mcg ethinyl estradiol	1 mg norethindrone	Nortrel 1/35[d] Necon 1/35[a] Norinyl 1+35[a]
35 mcg ethinyl estradiol	0.5 mg norethindrone	Brevicon[a] Nortrel 0.5/35[d] Necon 0.5/35[a]
35 mcg ethinyl estradiol	0.4 mg norethindrone	Ovcon-35[b]
35 mcg ethinyl estradiol	0.25 mg norgestimate	Ortho-Cyclen[c]
35 mcg ethinyl estradiol	1 mg ethynodiol diacetate	Zovia 1/35E[a]
30 mcg ethinyl estradiol	1.5 mg norethindrone acetate	Loestrin Fe 1.5/30[f] Mirogestin Fe 1.5/30[a]
30 mcg ethinyl estradiol	0.3 mg norgestrel	Lo/Ovral[c] Cryselle[d] Low-Ogestrel[a]
30 mcg ethinyl estradiol	0.15 mg desogestrel	Desogen[g] Ortho-Cept[c] Apri[d]
30 mcg ethinyl estradiol	0.15 mg levonorgestrel	Nordette[h] Levlen[i] Levora 0.15/30[a] Portia[d]
30 mcg ethinyl estradiol	3 mg drospirenone	Yasmin 3/0.03[i]
20 mcg ethinyl estradiol	1 mg norethinedrone acetate	Loestrin Fe 1/20[f] Microgestin Fe 1/20[a]
20 mcg ethinyl estradiol	0.1 mg levonorgestrel	Alesse[c] Levlite[i] Aviane[d] Lessina[d]

Table 3. Multi

Product			
Tri-Norinyl (Wats			hindrone, hinyl estradiol blets)
Ortho-Novum 7/ (Ortho-McNeil Pharmaceutica			ndrone, hinyl estradiol ablets)
Tri-Levlen (Berlex Laboratories)			onorgestrel, hinyl estradiol
TriPhasil (Wyeth-Ayerst Pharmaceuticals) Enpresse (Barr Laboratories, Inc)	(6 brown tablets)	(5 white tablets)	(10 light yellow tablets)
Trivora (Watson Laboratories, Inc)	0.05 mg levonorgestrel, 30 mcg ethinyl estradiol (6 blue tablets)	0.075 mg levonorgestrel, 40 mcg ethinyl estradiol (5 white tablets)	0.125 mg levonorgestrel, 30 mcg ethinyl estradiol (10 pink tablets)
Ortho Tri-Cyclen (Ortho-McNeil Pharmaceutical)	0.18 mg norgestimate, 35 mcg ethinyl estradiol (7 white tablets)	0.215 mg norgestimate, 35 mcg ethinyl estradiol (7 light blue tablets)	0.25 mg norgestimate, 35 mcg ethinyl estradiol (7 blue tablets)
Estrostep Fe (Parke-Davis)	1 mg norethindrone acetate, 20 mcg ethinyl estradiol (5 white triangle tablets)	1 mg norethindrone acetate, 30 mcg ethinyl estradiol (7 white square tablets)	1 mg norethindrone acetate, 35 mcg ethinyl estradiol (9 white round tablets)
Cyclessa (Organon)	0.1 mg desogestrel, 25 mcg ethinyl estradiol (7 yellow tablets)	0.125 mg desogestrel, 25 mcg ethinyl estradiol (7 orange tablets)	0.15 mg desogestrel, 25 mcg ethinyl estradiol (7 red tablets)
Ortho Tricyclen Lo (Ortho-McNeil Pharmaceutical)	0.18 mg norgestimate, 25 mcg ethinyl estradiol (7 white tablets)	0.25 mg norgestimate, 25 mcg ethinyl estradiol (7 light blue tablets)	0.25 norgestimate, 25 mcg ethinyl estradiol (7 blue tablets)

Adolescent I Quiz:

1. List 3 **non-contraceptive benefits to OCPs** that have come up in your clinical practice *(e.g. as reasons teens have requested OCPs, reasons you have used to convince teens to start OCPs).*

2. **IUD** Fact vs. Fiction:

A) Should not be used in nulliparous women _____
B) Change cervical mucus and lead to atrophy of the endometrial lining _____
C) Associated with long-term increased risk of PID _____
D) Cause amenorrhea in 60% of women _____
E) Result in rapid return to fertility after removal _____

3. List Pros & Cons for the following the **"newer" combined oral contraceptive** options:

COC Option	Pros	Cons
Drospirenone/Desogetrel Pills		
Lower-dose Estrogen Pills		
24-4 or 84-7 Cycle Regimens		

4. Based on known **contraindications**, indicate if you would prescribe OCPs to the following patients:

A) 17 year-old smoker _____
B) 14 year-old well-controlled Type I diabetic _____
C) 13 year-old with common migraines (w/o aura) _____
D) 19 year-old with Protein S deficiency _____
E) 15 year-old with epilepsy on Trileptal _____

Adolescent I *Mega*-Case:

Stacy presents with her mother for a mid-year sports-physical. She is a 15 y.o. girl with no medical problems. You learn she was not allowed to try out for fall cheerleading because she was grounded for most of the summer. When you ask why, she glances at her mom and says only, "It's complicated". After completing the initial interview, you ask Stacy's mother to leave the room. She says, "I've never been asked to leave before. Do I have to? It's just a physical."

How do you convince Stacy's mom to leave?

In private, Stacy confides that her parents found out she became sexually active this past summer. Unbeknownst to them, she continues to have sex with the same boyfriend. She reports they "pretty much always use condoms". She tells you that she would like to be on birth control, but doesn't want her parents to know. She asks if you have to tell her parents.

What do you tell her?

What are her contraceptive options? What are the advantages and disadvantages of each?

What other information do you need to determine the best options for this patient?

Which contraceptive methods can she obtain at our institution?

Stacy is relieved to hear there are contraceptive options available to her without her parents' direct involvement. She still looks nervous, however, and when you inquire about that she says, "My mother told me I couldn't get birth control without a female exam. Do I really have to?"

What do you say? What other diagnostic tests should you consider?

Stacy decides that she would like to start OCPs. **What other guidance should you provide?**

After discussing it together, Stacy accepts your offer to help disclose her desire for birth control to her mother. She is not ready to tell her mother she is still having sex with her boyfriend, or to tell her father anything. You disclose the pertinent highlights of the contraception discussion once Stacy's mom is back in the room. The conversation is awkward, but it gives you the opportunity to address mom's concerns, and afterwards she seems considerably relieved.

Stacy returns for her follow up visit *3 months later*. **What will you discuss at follow up?**

Stacy reports forgetting her pills about once a week – usually on weekend evenings when she is out with friends. **What advice could you give her about her problem with adherence?**

Stacy likes your idea about daily text-message reminders since, she admits, “I’m always on my phone”. Then she asks you, “I’m going to cheerleading camp this summer, and I’d like to not have my period while I’m there. I heard there’s a birth control where you only have to have 4 periods a year.” **How will you counsel her?**

Although you try to encourage Stacy to try Nexplanon or Depo, the thought of a shot or incision terrifies her, and she opts for a trial of an extended cycle regimen, with text-message reminders. She sends you a RelayHealth message from cheerleading camp, thanking you for helping her to control the timing of her periods this summer.

The next time you hear from Stacy is *2 years later*. She admits that she stopped using birth control a few months ago since “it had been so long,” but she just had sex with her new boyfriend for the first time 2 days ago. She is in tears. She says another cheerleader told her about ‘the morning after pill,’ and she wonders if that is an option for her.

What would you tell her?

Adolescent I Board Review:

1. During a health supervision visit, an adolescent girl asks about birth control options. You discuss the issues of personal choice, compliance, confidentiality, and contraceptive efficacy.

Of the following, the birth control method that is the MOST effective when used as directed is
A. combined oral contraceptive pills
B. depomedroxyprogesterone acetate
C. latex condoms
D. levonorgestrel intrauterine device
E. vaginal ring

2. A 15-year-old female patient calls to request that you call in a prescription for emergency contraception. Her last sexual activity was 4 days ago, and her partner did not use a condom.

Of the following, the BEST choice for emergency contraception for this girl is
A. IUD
B. Levonorgestrel
C. Mifepristone
D. Ulipristal acetate
E. Yuzpe regimen

3. An adolescent girl is being treated for a *Chlamydia* infection that was discovered on routine screening. She is asymptomatic and believes she acquired the infection from a previous partner. After addressing antibiotic treatment for the girl and her current partner, you discuss prevention of future infections.

Of the following, the MOST effective prevention message for her at this time is to
A. Begin and consistently use hormonal contraception
B. Douche after sexual intercourse
C. Maintain a monogamous relationship
D. Undergo frequent testing for STIs
E. Use condoms consistently