EducatiOnal ObjectiVeS
After participating in this activity, pharmacists will be able to:

- Discuss methods of birth control, including hormonal contraceptives
- Identify appropriate options for contraception based on patient characteristics
- Distinguish each FDA-approved contraceptive product by the symptoms they address and side effects they may produce
- Maximize the pharmacist's role in identifying birth control misuse, prescribing appropriate hormonal contraceptives, and counseling patients accordingly

After participating in this activity, pharmacy technicians will be able to:

- Discuss the basic facts about hormonal birth control
- Acquire reputable sources for patients who have questions about birth control
- Recognize over-the-counter and prescription drugs that may affect birth control effectiveness
- Infer when to refer patients to the pharmacist for recommendations

ABSTRACT: About 28% of women of reproductive age do not have reasonable access to prescription contraceptives. Seven states and the District of Columbia currently allow pharmacists to prescribe contraceptives to women; this number is growing. Combined hormonal contraceptives (CHC) are available in many forms. Progestin-only pills are also available for women with medical conditions excluding them from CHC use or unable to tolerate estrogens. Pharmacists can make recommendations based on patients' needs and experiences and prescribe where state law allows. Additional contraceptive options are available over-the-counter. Pharmacy teams are positioned to recognize women who would benefit from referral to another healthcare provider for longer-acting alternatives, and those needing over-the-counter or emergency contraceptives. Hormonal contraceptives rely heavily on adherence; missed doses can lead to birth control failure, resulting in unintended or mistimed pregnancy. Pharmacists should be able to counsel women on what to do in the event of a missed dose and recommend emergency contraceptives in the event of contraceptive failure. With proper education and training, pharmacy teams will be comfortable with prescribing hormonal contraceptives from the pharmacy where allowable.

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FACULTY DISCLOSURE: Dr. Giara has no actual or potential conflicts of interest associated with this article.

DISCLOSURE OF DISCUSSIONS of OFF-LABEL and INVESTIGATIONAL DRUG USE: This activity may contain discussion of off label/unapproved use of drugs. The content and views presented in this educational program are those of the faculty and do not necessarily represent those of the University of Connecticut School of Pharmacy. Please refer to the official prescribing information for each product for discussion of approved indications, contraindications, and warnings.

INTRODUCTION
More than 67 million women of reproductive age live in the United States (U.S.). Of those women, 19 million lack reasonable access to a public clinic with the ability to provide prescription contraceptives. The Centers for Disease Control and Prevention (CDC) reports that hormonal methods requiring a prescription (pill, patch, ring, and injection) prevent pregnancy more effectively than those available over-the-counter (male/female condom, spermicide) and methods such as withdrawal or fertility-awareness. Access to effective birth control
prevents unintended and mistimed births. Between 1991 and 2015, the teen birth rate dropped 64%, saving the U.S. $4.4 billion. If all women of reproductive age had access to effective methods of contraception to avoid unplanned pregnancy and childbearing, the U.S. could save an estimated additional $1.9 billion per year.¹

Pharmacists are access points to contraceptives. Outlined in Table 1, seven states and the District of Columbia allow pharmacists to prescribe self-administered contraceptives. This number is growing; Utah passed legislation in March 2018 to allow pharmacists to prescribe birth control and Maryland will follow suit when its law goes into effect in 2019. All of these states allow pharmacists to prescribe, but vary in other details (age requirement, length of supply, etc.). For example, in Oregon and Colorado, individuals under 18 years old must obtain their first prescription from a physician before a pharmacist can authorize refills.³

With this growing trend, pharmacists should be prepared to prescribe hormonal contraceptives where state law allows. They should be familiar with hormonal effects on the menstrual cycle, side effects of those drugs, and possible interactions with other medications or conditions. Pharmacists and pharmacy technicians should also be familiar with contraceptive options available over-the-counter, and long-term options that require referral to another healthcare provider.

DECIPHERING THE MENSTRUAL CYCLE

Menstruation, shedding of the uterine lining, occurs approximately once a month throughout a woman’s reproductive life, except during pregnancy. The first day of bleeding is cycle day 1, and cycles range from 25 to 36 days in length; only 10% to 15% of women experience a 28-day cycle naturally.⁴,⁵ The menstrual cycle is hormone-regulated, as shown in Figure 1. Luteinizing hormone (LH) and follicle-stimulating hormone (FSH) produced by the pituitary gland promote ovulation and estrogen and progesterone release from the ovaries. This hormonal fluctuation causes the three phases of the menstrual cycle: follicular (before egg release), ovulatory (egg release), and luteal (after egg release).⁴,⁵

| Table 1. Pharmacists' Prescriptive Authority Regarding Hormonal Contraceptives³ |
|----------------------------------|----------------|-------------|-----------|-----------|
| **State**                        | **Pill**      | **Patch**  | **Ring**  | **Injection** |
| California                       | Yes           | Yes        | Yes       | Yes        |
| Colorado                         | Yes           | Yes        | No        | No         |
| District of Columbia             | Yes           | Yes        | Yes       | Yes        |
| Hawaii                           | Yes           | Yes        | Yes       | Yes        |
| Maryland*                        | Yes           | Yes        | Yes       | Yes        |
| New Mexico                       | Yes           | Yes        | Yes       | Yes        |
| Oregon                           | Yes           | Yes        | No        | No         |
| Tennessee                        | Yes           | Yes        | No        | No         |
| Washington                       | Yes           | No         | No        | No         |

*Effective in 2019

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Figure 1. The Human Menstrual Cycle
Follicular Phase
The follicular phase, lasting about 13 to 14 days, is marked by the development of follicles in the ovaries. At the beginning of this phase, the uterine lining, or endometrium, is thick with fluids meant to sustain an embryo. If no egg is fertilized, estrogen and progesterone levels are low, causing the top layers of the endometrium to shed and menstrual bleeding. Concurrently, the pituitary gland slightly increases FSH production, stimulating the growth of three to 30 follicles, each containing an egg. As FSH levels subsequently drop, these stimulated follicles begin to break down while one follicle (deemed the dominant follicle) continues to grow and produce estrogen. This estrogen bump begins to prepare the uterus and stimulate the LH surge, marking the end of the follicular phase.4,5

Ovulatory Phase
The LH surge stimulates the dominant follicle to bulge from the ovary’s surface and rupture. This rupture, otherwise known as ovulation, releases the egg 10 to 12 hours after the LH surge.4,5 Measuring urine levels of LH can help determine when women are most fertile, as fertilization is more likely when sperm are present in the reproductive tract before ovulation (within three days).4,5 Some women experience a dull pain in the lower abdomen for a few minutes to a few hours during ovulation, referred to as mittelschmerz (literally, “middle pain”).

Luteal Phase
Assuming no fertilization, the luteal phase follows ovulation. In this phase, the ruptured follicle closes after releasing the egg and forms a corpus luteum. This structure produces progesterone to prepare the uterus in case an embryo is implanted, causing the endometrium to thicken and fill with fluids and nutrients for that potential embryo. Progesterone also causes cervical mucus thickening to prevent the entry of sperm or bacteria into the uterus and also increases body temperature. Estrogen levels remain elevated through the luteal phase as well, contributing to the thickening of the endometrium.4,5

Determining Pregnancy Status
Following the luteal phase, if no egg is fertilized or the egg does not implant, the corpus luteum degenerates after 14 days, estrogen and progesterone levels drop, and a new menstrual cycle begins. However, if a fertilized embryo is implanted, the cells around the embryo produce human chorionic gonadotropin (HCG). HCG maintains the corpus luteum, which continues to produce progesterone until the fetus can produce its own hormones. Pregnancy tests detect an increase in HCG in the blood or urine, indicating a fertilized embryo is present.4,5

The CDC recognizes that routine pregnancy testing for women is not necessary before initiating contraception. On the basis of clinical judgment, healthcare providers can omit a pregnancy test if a woman has no signs or symptoms of pregnancy and meets any of the following criteria6:

- Started normal menses less than seven days ago
- Has not had sexual intercourse since the start of last normal menses
- Has correctly and consistently used a reliable contraception method
- Experienced spontaneous or induced abortion less than seven days ago
- Is within four weeks postpartum
- Is fully or nearly-fully breastfeeding (exclusively or 85% or more of feeds), amenorrhoeic, and less than six months postpartum

PHARMACIST-PRESCRIBED CONTRACEPTIVES
Each form of contraception requires individual testing and/or considerations before initiation. Pharmacists who are properly educated about hormonal contraceptives can make recommendations based on patients’ needs and experiences and prescribe where state law allows. Pharmacists should also advise patients that hormonal and non-barrier contraceptives do not protect from sexually transmitted diseases (STDs); concurrent use of a barrier method, such as male latex condoms, reduces this risk.6
Combined Hormonal Contraceptives

Combined hormonal contraceptives (CHCs) include an estrogen and a progestin in oral, transdermal, or vaginal formulations. They are generally used for 21 to 24 consecutive days, followed by four to seven hormone-free days. They can also be used for an extended period with infrequent or no hormone-free days. A pelvic exam and cervical inspection are not needed for initiation of this class of medications, making it a practical option to prescribe from the pharmacy; however, pharmacists should obtain a verbal medical history before initiating. Conditions restricting the use of CHCs are current breast cancer, severe hypertension or vascular disease, heart disease, migraine headaches with aura, certain liver diseases, and complicated diabetes. CHCs are strongly discouraged in women who smoke, due to increased cardiovascular risk. This recommendation is increasingly important with age and number of cigarettes smoked daily; women 35 years or older who smoke 15 or more cigarettes daily should not use CHCs.6

Little examination or testing is needed before initiation of a CHC, but pharmacists should assess a woman’s blood pressure at baseline. Women with elevated blood pressure (systolic pressure of 140-159 mmHg or diastolic pressure of 90-99 mmHg), and especially those with severe hypertension (≥160/100 mmHg) or vascular disease should not use CHCs due to evidence of poor cardiac outcomes.6 A baseline weight and BMI are also useful for monitoring therapy. Obesity is not a restriction to using CHCs, but a baseline weight can help monitor possible weight gain due to hormonal changes.6

Combined Oral Contraceptives

Combined oral contraceptives (COCs) are CHCs taken orally on a daily basis. All products in this class should be considered equally effective; with perfect use, efficacy exceeds 99%, but with typical use, up to 8% of users may become pregnant.6,8 COCs come in both monophasic (fixed doses of estrogen and progestin) and multiphasic formulations (vary in dose from week to week). Patients who are interested in COCs should start on monophasic regimens, as there is more safety data and it is easier to deal with a missed dose. Most traditional COCs contain 21 active tablets, followed by seven placebo or iron-containing tablets. Some regimens offer fewer hormone-free days or continuous-or extended-cycles, reducing the number of bleeding days per month or year.6,8 Women can start oral contraceptives on any day; three options for start dates are:

1. “Quick-start method”: Woman takes the first pill on the day it is prescribed.
2. “First-day start method”: Woman takes the first pill on the first day of the next menstrual cycle.
3. “Sunday start method”: Woman takes the first pill on the first Sunday after starting the menstrual cycle; this method isolates hormone-free days to the end of the week, which can be more desirable.

The most common estrogen used in COCs is ethinyl estradiol, in doses ranging from 10 to 50 mcg. Mestranol, another estrogen used rarely in COCs, is 50% less potent than ethinyl estradiol and is converted to ethinyl estradiol in the body.4 Of note, it is important to use the lowest effective and tolerated dose of estrogen due to the slightly increased risk of venous thromboembolism. Patients generally do not need a product with more than 35 mcg of ethinyl estradiol unless they are also taking a drug that induces the metabolism of the COC (discussed later).7

Progestins available in oral contraceptives are more varied. All progestins have a high affinity for progesterone receptors, but differ in their affinity for other receptors, like androgen or glucocorticoid receptors. This varying affinity does not affect the ability to prevent pregnancy, as all are equally effective. It does, however, affect the incidence of adverse effects.8 First-generation progestins—norethindrone, norethindrone acetate, and ethynodiol diacetate—are the oldest and have affinity for both progesterone and androgen receptors. Second-generation progestins—norgestrel and levonorgestrel—have higher affinity for the same receptors. Higher affinity to progesterone receptors results in less breakthrough bleeding and spotting. However, higher affinity to androgen receptors causes increased incidence of androgenic side effects: acne, abnormal hair growth (hirsutism), dyslipidemia, and weight gain. Third-generation progestins—norgestimate and desogestrel—were developed to decrease activity at androgen receptors, causing fewer androgenic side effects.7,8 Researchers designed even newer progestins—drosperinone and dienogest—to bind primarily to progesterone receptors with little to no androgen receptor activity. These newer progestins may even have some antiandrogenic effects.7,8

Transdermal Patch

The only combined hormonal contraceptive patch available in the U.S. contains ethinyl estradiol and norelgestromin (the active metabolite of norgestimate).4,10 Pharmacists should consider the patch for patients who have trouble adhering to a daily regimen, as women only need to change it once a week for three weeks, followed by a patch-free week.4,10 Of note, the patch may be less effective in patients who weigh more than 198 lbs (90 kg), so a baseline weight is helpful. Pharmacists should counsel patients to wear the patch on the upper arm, stomach, back, or buttock, where it won’t be rubbed by tight clothing, and to rotate application sites to avoid skin irritation.4,10 The patch also causes higher estrogen exposure compared to oral contraceptives, so dysmenorrhea (menstrual cramps) and breast discomfort may be more frequent. Application site reactions and detachment are also possible, so pharmacists should consider alternative options for women with pre-existing skin conditions.7,10
**Vaginal Ring**
One contraceptive vaginal ring is available in the U.S. containing ethinyl estradiol and etonogestrel (desogestrel’s active metabolite). The U.S. Food and Drug Administration (FDA) recently approved another vaginal ring—ethinyl estradiol-segesterone acetate—and it is expected to be available in late 2019.4,7 This method is another option to consider in patients with adherence issues. The patient places the ring intravaginally and leaves in place for three weeks, followed by one ring-free week. The ring can be left in place for a maximum of four weeks, reducing or eliminating the number of hormone-free days. Also, return to fertility is rapid after discontinuation.7,11

Estrogen exposure with the vaginal ring is lower compared to oral contraceptives, leading to decreased incidence of estrogen-related side effects, but it does lead to more localized issues, like vaginal irritation and discharge. Some women may be concerned that the ring may be uncomfortable or fall out; pharmacists should reassure them that this happens in fewer than 5% of patients.7,11 Additionally, tampon use does not affect the absorption of hormones released by the ring.11

**Injectable**
Depo-medroxyprogesterone acetate (DMPA) is a progestin-only contraceptive available as an intramuscular (150 mg) or subcutaneous (104 mg) injection. The patient or a healthcare provider administers the injection once every three months, thus eliminating the need for daily adherence.12 Pharmacists should tell patients that the subcutaneous product causes less injection pain and is equally effective. However, the subcutaneous injection is available as a brand name product only, so insurance companies may be less likely to cover it.13

Timing of the injection is relatively flexible. Early injection is safe if a woman cannot return at the routine interval, and injection can be given up to two weeks late without requiring additional contraceptive protection. However, if the woman is more than two weeks late for injection, she should abstain from sexual intercourse or use additional protection for seven days after the injection is given.6 While DMPA is reversible and can be used by women of all ages, including adolescents, pharmacists should inform patients that return to fertility can be delayed by 6 to 12 months after the last injection; the median time to pregnancy after discontinuation is 10 months.6,7,12 Women with hypertension can generally use DMPA, but it should not be used in patients with severe hypertension or vascular disease. Injectable DMPA is also safe in breastfeeding women when given at least six weeks postpartum.6,8 The DMPA injection’s common adverse effects include weight gain, decreased bone mineral density, and bleeding irregularities.12

**Progestin-Only Pills**
Progestin-only pills (POPs), or “minipills,” are oral hormonal contraceptives containing only a progestin. The only POP available in the U.S. is norethindrone 350 mcg taken once daily. Although dispensed in a four-week pack like COCs, patients take POPs continuously with no hormone-free breaks. Pharmacists should counsel patients to take all pills in the pack and start a new pack immediately after completion.4 This is an especially important counseling point to reiterate to women switching from CHCs to POPs who may be accustomed to taking a placebo week of pills. POPs have a very short half-life, so taking them at the same time each day is critical. Taking a POP more than three hours late is cause for extra caution; patients should use backup contraception until taking the POP consistently for 48 hours.4,6 Pharmacists should address possible adherence issues before considering a patient for POPs.

Restrictions to use for POPs are similar to those of CHCs, with the exception of blood pressure monitoring. No examinations or tests are needed before initiation, and women with hypertension may use POPs. A baseline weight and BMI are useful for monitoring patients for weight gain.6 While CHCs may reduce breast milk production, POPs do not. Pharmacists should consider POPs as a viable option for postpartum women who are breastfeeding and for those who tolerate estrogen poorly or in whom it is contraindicated.7 Patients with the following conditions should be considered for POPs:4

- Migraine headaches
- History of thromboembolic disease
- Cerebrovascular disease
- Heart disease
- Systemic lupus erythematos with vascular disease
- Hypertriglyceridemia
- Age older than 35 years who are smokers, obese, hypertensive, or have vascular disease
NON-PHARMACY ALTERNATIVES

Long-Acting Reversible Contraceptives
The results of a survey by the Urban Institute, a nonprofit research organization, show that knowledge gaps and misinformation exist surrounding birth control methods. While women of reproductive age proved familiar with oral contraceptives and condoms, only 31% knew about more effective methods, like intrauterine devices (IUDs) and implants. 14 Although long-acting reversible contraceptives, including IUDs and the etonogestrel implant, are not available in the pharmacy or via pharmacist prescribing in the U.S., pharmacy teams should be familiar with them and their most common adverse effects.

Intrauterine Devices
An IUD is a small, T-shaped device that is inserted into the uterus by a physician and left inside to prevent pregnancy, mainly by preventing fertilization of an egg by sperm. Four IUDs are available in the U.S., including the copper-containing IUD –approved for up to 10 years of use – and three levonorgestrel-releasing IUDs – approved for three to five years of use depending on the brand. The copper IUD releases copper into the uterus, which interferes with sperm’s ability to move, while the progestin in hormonal IUDs thicken cervical mucus. These mechanisms are meant to make it harder for sperm to enter the uterus and reach an egg. 15 IUDs are long-acting, reversible, and reliable; fewer than one woman in 100 will become pregnant in the first year of typical use. IUDs can be used by women of all ages, including adolescents, and by nulliparous (never pregnant) and parous women (pregnant at least once). 6,15

Pharmacists, as the most accessible healthcare providers, may find themselves fielding questions from patients on IUDs. Important things to note are 3:

- Bleeding and cramping are common during the first week; counsel patients that this should resolve itself.
- Irregular or light bleeding may occur during the first three to six months following insertion of a levonorgestrel-IUD, but bleeding generally decreases overall with continued use and can stop completely.

Older studies suggested that pre-treatment with misoprostol allowed easier IUD insertion. However, more recent studies show no benefit, only an increased incidence of side effects. Pharmacists may still see prescriptions for misoprostol for this indication, but the American College of Obstetricians and Gynecologists (ACOG) makes no recommendation. 15,16

Etonogestrel Implant
The etonogestrel implant, a single 68 mg etonogestrel rod, is a long-acting, reversible form of contraception that can be used in women of all ages. It is a flexible, plastic rod about the size of a matchstick inserted under the skin on the inside of the non-dominant upper arm by an authorized clinician and left in place for up to three years. Fertility returns rapidly after removal. As with other progestin-based therapies, bleeding irregularities are common. Other possible adverse effects include digestive difficulties, headaches, breast pain, weight gain, and acne. 7,15 While it is not available in pharmacies, pharmacists should familiarize themselves with the etonogestrel implant to make informed recommendations in appropriate patients. They should also make note of patients using the implant and recognize possible adverse effects upon consultation.

BARRIER AND OTC CONTRACEPTIVES
In patients for whom hormonal contraceptives are inappropriate, pharmacists should be prepared to recommend over-the-counter non-hormonal options, including condoms, diaphragms, and chemical spermicides. Both male and female condoms are available. Male latex condoms are the most effective option. Additionally, they are most effective when used correctly, but can break if stored improperly or used with oil-based lubricants or vaginal medications. 4,7 Mineral-oil based vaginal drug formulations (clindamycin vaginal cream, conjugated estrogen vaginal cream, and over-the-counter yeast infection treatments, to name a few) can decrease latex’s barrier strength by 90% in 60 seconds. 4

Diaphragms and cervical caps are also barrier contraceptives. They are used with spermicide and placed intravaginally over the cervix. Women can insert diaphragms up to six hours before intercourse and should not remove them until six hours after. They should not be left in place for more than 24 hours and spermicide must be reapplied before each act of intercourse. Cervical caps should be placed 15 to 40 minutes before intercourse and patients should wait at least six hours after intercourse before removing them (maximum 48 hours). 7

Nonoxynol-9 is the only chemical spermicide available in the U.S. It is available as foam, film, gel, cream, suppository, and tablet formulations. Women should place the spermicide in the vagina no more than one hour before intercourse and patients should wait at least six hours after intercourse before removing them (maximum 48 hours). 7 Nonoxynol-9 does not prevent HIV transmission and may even increase the risk of HIV infection in women using it frequently.

Nonoxynol-9 is also available over-the-counter in a sponge that is moistened with water until it is sudsy and wet and placed over the cervix indented side up before intercourse. It should be left in for at least six hours after intercourse, but should be removed by 24 to 30 hours later due to the risk of toxic shock syndrome. Pharmacists should counsel that toxic shock syndrome’s most common signs/symptoms include the following: 18

- Nausea or vomiting
- Sudden high fever and chills
- Watery diarrhea
- Rash resembling a bad sunburn or red dots on the skin
- Dizziness, light-headedness, or fainting
- Hypotension
DRUG SAFETY & THE PHARMACIST

Oral contraceptives are the most widely used form of prescription contraception in the U.S., but women frequently discontinue them because they cannot adhere to daily schedules or have adverse effects. Pharmacy teams can make recommendations about a patient’s therapy and make changes where allowed to tailor therapy to the patient’s needs.

Side Effect Management

Side effects understandably lead to poor adherence and ineffective control. Oral contraceptives are available in a variety of doses and hormone combinations. Pharmacists and technicians should be aware of each product’s unique side effect profiles that may impede a patient’s willingness to adhere. Additionally, pharmacists who understand how to combat these effects by changing doses or products can prevent premature discontinuation, especially in those states where pharmacists can make changes themselves. Pharmacy teams should tell patients that many symptoms occurring in the first cycle of contraceptive use improve by the second or third cycle, so adherence is important.

Too much estrogen causes nausea, breast tenderness, weight gain, headaches, and menstruation changes. To improve these symptoms, pharmacists can consider decreasing estrogen content or switching to a progestin-only regimen. Pharmacists should remember the vaginal ring provides the lowest estrogen exposure, while the patch provides the most. Estrogen deficiency can lead to vasomotor symptoms (night sweats, hot flashes, etc.) or early cycle (days 1 through 9) breakthrough bleeding or spotting. In this case, estrogen doses should be increased. Amenorrhea – the absence of withdrawal bleeding – can also be caused by an estrogen deficiency. The estrogen dose can be increased if the patient desires menses, but pharmacists should rule out pregnancy first. If amenorrhea is acceptable to the patient, no change is necessary.

Excess progestins cause breast tenderness, headache, fatigue, and mood changes (depression, irritability). Decreasing the progestin content of the drug selected or switching to a progestin with less progestin activity, such as drospirenone or a first-generation progestin can lessen these symptoms. Additionally, the androgenic effects of first- and second-generation progestins can lead to weight gain, acne/oily skin, and hirsutism. Choosing a product with a less androgenic progestin (third-generation or newer) will address these adverse effects.

Progestin deficiency, on the other hand, can lead to dysmenorrhea (painful periods), menorrhagia (heavy menstrual bleeding), or late-cycle (days 10 through 21) breakthrough bleeding or spotting. Increasing progestin doses can help with all of these effects. In the event of bothersome dysmenorrhea or menorrhagia, pharmacists should also consider extended-cycle or continuous regimen oral contraceptives, as these patients would benefit from fewer or no menses at all.

Technician Talk: Recognizing Over-the-Counter Appropriateness

Technicians especially should be familiar with over-the-counter birth control methods and their restrictions.

Male condoms – made of latex, lambskin, or polyurethane – are placed on the erect penis and prevent sperm from entering the vagina. Some include a spermicide for additional protection. With the exception of lambskin, most male condoms protect from sexually transmitted infections, including HIV, when used correctly.

A female condom is a lubricated pouch inserted into the vagina as a barrier. While less effective than male condoms, they can be inserted up to eight hours before intercourse, making them more ideal for those unwilling to interrupt an intimate moment.

Nonoxynol-9 spermicide, discussed in full on page 6, may be used alone or with other types of birth control, like condoms or diaphragms.

The spermicidal sponge is about two inches wide and made of soft foam with a loop on one end for removal. Women should not use the contraceptive sponge if they:

- are allergic to sulfites, polyurethane, or spermicide
- have physical vaginal issues
- have had a recent abortion
- have recently miscarried
- have recently given birth
- have an infection in the reproductive tract
- have a history of toxic shock syndrome (a serious systemic bacterial infection caused by either Streptococcus pyogenes or Staphylococcus aureus)
**Missed Doses and Birth Control Failure**

Late or missed doses are a concern with oral hormonal contraceptives. Inconsistent or incorrect use of these medications is a major cause of contraceptive failure. Pharmacy teams should be prepared to advise patients how to proceed if they miss one or more doses. When making dose adjustments or when a patient switches from one contraceptive to another, pharmacists should recommend the woman use backup contraception for seven days.

**Combined Oral Contraceptives:** If one pill is late (less than 24 hours have passed since it should have been taken) or missed (24 to less than 48 hours have passed), advise the patient to take the late or missed pill as soon as possible. The patient should also continue taking the remaining pills at the usual time, even if that means taking more than one dose in the same day. No back-up contraception is needed, but patients can consider emergency contraception if they have had a previous late or missed dose in the same cycle.

If two or more consecutive pills are missed (48 hours or more have passed since the pill should have been taken), the most recently missed pill should be taken as soon as possible and any other missed pills should be discarded; therapy should then continue as usual. In this case, pharmacists should advise patients to use back-up contraception (e.g., condoms) or remain abstinent until they have taken hormonal pills for at least seven consecutive days. If pills were missed in the last week of hormonal pills, advise the patient to skip the placebo interval; finish the remaining hormonal pills in the current pack and start a new pack the next day. Pharmacists should also recommend emergency contraception when patients miss pills during the first week and had unprotected intercourse.

**Progestin-Only Pills:** A POP dose that is more than three hours late is cause for concern. In the event of a missed POP dose, pharmacists should advise patients to take the missed pill as soon as possible then go back to taking it at the regularly scheduled time. They should also use backup contraception until the POP has been taken consistently for at least 48 hours. If a woman vomits soon after taking the pill, she should use a back-up method of contraception for at least 48 hours.

In either case, backup contraception should be used until the ring has been in place for seven consecutive days. If the ring has been out of the vagina for an unknown amount of time, women should have a pregnancy test before inserting a new ring.
Drug-Drug Interactions
Pharmacists are trained to recognize potential interactions that could affect birth control effectiveness. The most prevalent offenders are CYP3A4-inducing medications. Anticonvulsants—barbiturates (including phenobarbital and primidone), carbamazepine, felbamate, phenytoin, topiramate, vigabatrin—decrease contraceptive effectiveness due to CYP3A4 induction. Pharmacists should recommend oral contraceptives containing 50 mcg of ethinyl estradiol in conjunction with a second method of contraception. IUDs are also appropriate for patients on CYP3A4-inducing medications. Pregnancy prevention is especially important in the case of anticonvulsants, as many are known teratogens that pose a risk to the child if a woman becomes pregnant.

Other drugs that decrease hormonal contraceptives’ effectiveness:

- Griseofulvin
- Nonnucleoside reverse transcriptase inhibitors (dela-virdine, efavirenz, nevirapine)
- Protease inhibitors (amprenavir, atazanavir, indinavir, lopinavir, nelfinavir, ritonavir, saquinavir)
- Rifampin

Some case reports have also shown reduced ethinyl estradiol levels in patients taking tetracyclines and penicillin derivatives. Pharmacists should counsel patients on the small risk of decreased effectiveness while taking antibiotics in these classes, and suggest back-up contraception be used in the interim. Women who experience breakthrough bleeding while on antibiotics should also be advised to use alternative methods of contraception during the period of concomitant use.

St. John’s wort is an over-the-counter herbal product that some patients use because it is thought to help with depression. This substance is also a CYP3A4 inducer, leading to decreased effectiveness of many other drugs, including hormonal contraceptives. Pharmacy teams should discourage the use of St. John’s wort with hormonal contraceptives.

Generic Alternatives
The majority of oral contraceptives are available as generic products. However, many patients are hesitant to substitute a different oral contraceptive product. Pharmacists should counsel patients that generic oral contraceptives are only approved if they bioequivalent and shown to produce the same effects and similar side effect profiles as the innovator products. Given the range of bioequivalence needed for approval, increased side effects or other problems are equally as likely when switching between two batches of brand name medication made by the same manufacturer. Breakthrough bleeding, which is a common cause of oral contraceptive discontinuation, can be caused by missed pills, smoking, infection, or drug interactions. Pharmacists should counsel patients that outside factors like these are far more likely to affect a patient’s experience on a generic alternative than possible subtle variations in pharmacokinetic profiles. Adherence to generic alternatives should be encouraged whenever possible to decrease the patient’s out-of-pocket costs.

PAUSE AND PONDER:
What might you say to a woman who is hesitant to switch to a generic contraceptive?

PHARMACY TEAM’S ROLE
New laws allowing pharmacists to prescribe hormonal contraceptives will improve access for women seeking to initiate or adjust their current form of birth control. Pharmacists should consult their state’s laws before initiating or adjusting contraceptives. Regardless of the ability to prescribe, pharmacy teams can counsel patients and recommend changes by:

- Counseling on available options
- Understanding how to alleviate adverse effects
- Screening for interactions
- Counseling on medication safety

For patients looking to do their own research at home, it is important to point them toward reputable sources. Pharmacy teams can confidently recommend patients visit the sites found in Table 2.

CONCLUSION
Pharmacists are being asked to become more involved in selecting and prescribing hormonal contraceptives. Several different hormonal and non-hormonal birth control therapies are available. Pharmacists should be familiar with what’s available, when to use or avoid certain options, and how to adjust therapy based on patient factors and in response to adverse effects.
Table 2. Reputable Sources for Patients

<table>
<thead>
<tr>
<th>Source</th>
<th>Description</th>
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<tbody>
<tr>
<td>U.S. Department of Health and Human Services: Office on Women’s Health</td>
<td>- Frequently asked questions (FAQs) about contraceptives, what is available with and without a prescription, and related women’s health topics</td>
</tr>
<tr>
<td>Planned Parenthood: Birth Control</td>
<td>- Effectiveness and cost comparisons of available birth control methods and details regarding the use of each</td>
</tr>
<tr>
<td>The American College of Obstetricians and Gynecologists: Patient Education FAQs</td>
<td>- Patient education search engine regarding birth control methods and women’s health</td>
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Figure 3. Advancing Pharmacists and Pharmacy Technicians Role in Contraceptive Care

**Best**
1. **Be COMMUNITY CHAMPIONS** and talk to women of reproductive age about the importance of scheduling annual exams
2. **Collaborate** with local family planning clinics to enhance information transfer and improve patient safety
3. **Counsel, counsel, counsel and emphasize** proper adherence for each product. It takes just a few minutes!

**Better**
1. **Always ask about potential adherence issues** when filling prescriptions for contraceptives
2. **Recognize that not all contraceptives are suitable for every woman** when dispensing and make a note of comorbidities! Remind patients that most contraceptives don’t prevent sexually transmitted infection. This can increase safety.
3. **Know the basic contraceptive choices** and how women can access care for non-pharmacy contraceptives

**Good**
1. **Be familiar with common contraceptives** in general, and the red flags that indicate referral to an women’s health specialist
2. **Educate patients** about the differences between contraceptives
REFERENCES