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Clinical Management Guidelines for Obstetrician–Gynecologists

Committee on Practice Bulletins—Gynecology. This Practice Bulletin was developed by the Committee on Practice Bulletins—Gynecology in collaboration with Rebecca H. Allen, MD, MPH; Andrew Kaunitz, MD; and Deborah Bartz, MD, MPH.

Use of Hormonal Contraception in Women With Coexisting Medical Conditions

Although numerous studies have addressed the safety and effectiveness of hormonal contraceptive use in healthy women, data regarding women with underlying medical conditions or other special circumstances are limited. The U.S. Medical Eligibility Criteria (USMEC) for Contraceptive Use, 2016 (1), which has been endorsed by the American College of Obstetricians and Gynecologists, is a published guideline based on the best available evidence and expert opinion to help health care providers better care for women with chronic medical problems who need contraception. The goal of this Practice Bulletin is to explain how to use the USMEC rating system in clinical practice and to specifically discuss the rationale behind the ratings for various medical conditions. Contraception for women with human immunodeficiency virus (HIV) (2); the use of emergency contraception in women with medical coexisting medical conditions, including obesity, (3); and the effect of depot medroxyprogesterone acetate (DMPA) on bone health (4) are addressed in other documents from the American College of Obstetricians and Gynecologists.

Background

Decisions regarding contraception for women with coexisting medical conditions are critical. Hypertension, ischemic cardiac disease, valvular cardiac disease, diabetes, and stroke are a few conditions associated with increased risk of adverse outcomes in the setting of an unintended pregnancy (1). Medications taken for certain chronic conditions may be teratogenic or alter the effectiveness of hormonal contraception. Therefore, pregnancy planning is vital for the health of these patients to optimize their medical conditions before pregnancy (5) in order to improve maternal and neonatal outcomes (6).

Counseling women with coexisting medical conditions regarding contraception should balance the potential risks of using contraceptive methods against the potential risks of an unintended pregnancy. This will necessarily involve assessing the nature and severity of the patient's medical condition; the patient's personal preferences; her reproductive goals; and the effectiveness, acceptability, and availability of alternative methods. Combined estrogen–progestin hormonal contraceptives include pill, vaginal ring, and patch formulations. Available progestin-only methods include DMPA injections, etonogestrel implant, progestin-only pills, and levonorgestrel-releasing intrauterine devices (LNG-IUDs). Practitioners should recognize that effective nonhormonal forms of contraception, such as the copper IUD or sterilization, remain safe choices for many women with medical conditions (1).

Use of the U.S. Medical Eligibility Criteria for Contraceptive Use

The USMEC is routinely updated and uses four categories to classify medical conditions that affect eligibility for the use of each contraceptive method (Box 1). The four-tiered category system designates the level of risk associated with a particular contraceptive among women

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with certain characteristics (eg, age or history of pregnancy) or known preexisting medical problems (eg, diabetes or hypertension) compared with the risk associated with unintended pregnancy (1). Unintended pregnancy and its associated risks, as opposed to no risk, is the comparative condition because approximately 85% of sexually active women will become pregnant within 1 year if they are not using contraceptives (7). When using hormonal contraceptives to treat gynecologic problems in conjunction with pregnancy prevention, the risk–benefit balance may change.

The USMEC category 1 indicates that there are no restrictions to use of the contraceptive. Category 2 indicates that the benefits of the contraceptive outweigh the risks and the patient still can use the method, although in certain situations there may be a need for additional follow-up. Category 3 means that the risks of the contraceptive generally outweigh the benefits. Nevertheless, the method still may be used if nothing else is available or acceptable to the patient and she has been counseled about the potential risks. The patient may require close follow-up to ensure that continued use is safe. Category 4 conveys that the method is contraindicated and should not be used (Box 1). Rarely, a Category 4 method might be considered and used in consultation with the patient's other health care providers if no alternative methods are available. In addition, certain USMEC recommendations are subdivided into two categories: 1) initiation (I) of a new contraceptive method and 2) continuation (C) of a currently used contraceptive method. The USMEC category for continuation should guide decision making when a condition develops or worsens during use of a contraceptive method.

The USMEC recommendations assume that no other risk factors or conditions are present. When patients present with multiple medical conditions, the condition with the highest category number generally should be used to determine the safety of the contraceptive choice. For example, combined hormonal contraceptives for a 25-year-old woman with migraines with aura (USMEC category 4) and rheumatoid arthritis (USMEC category 2) would be contraindicated because of the migraines with aura. The USMEC does have one category that provides recommendations for the patient with multiple conditions: multiple risk factors for atherosclerotic cardiovascular disease (eg, older age, smoking, diabetes, hypertension, low high-density lipoprotein [HDL], high low-density lipoprotein [LDL], or high triglyceride levels).

Clinical Considerations and Recommendations

▶ *Is hormonal contraception safe for women with a history of venous thromboembolism or at risk of a thromboembolic event?*

The estrogenic component of combined hormonal contraceptives increases hepatic production of serum globulins involved in coagulation (including factor VII, factor X, and fibrinogen) and increases the risk of venous thromboembolism (VTE) in users. Although all combined hormonal contraceptives cause an increased risk of VTE, this risk remains half as high as the elevated risk observed in pregnancy (8–10). Women with certain conditions associated with VTE (Box 2) should be counseled for nonhormonal or progestin-only contraceptives (1). For women with a prior VTE, the risk of a recurrent VTE depends on whether the initial thrombosis was associated with a risk factor that is permanent (eg, factor V Leiden) or reversible (eg, surgery) (11). Therefore, a combined hormonal contraceptive candidate with a history of a single episode of VTE that occurred years earlier and was associated with a nonrecurring risk factor (eg, after immobilization because of a motor vehicle accident) may not currently be at increased risk of a recurrent VTE, and a combined hormonal contraceptive may be considered if no other method is available or desired (USMEC category 3). Women at risk of VTE who use anticoagulation are at risk of gynecologic complications of this therapy, such as hemorrhagic ovarian cysts or heavy menstrual bleeding. Combined hormonal methods may be of benefit to these patients beyond pregnancy prevention, affecting the risk–benefit ratio for each patient and should be considered on a case-by-case basis.

Box 1. Categories for Medical Eligibility Criteria for Contraceptive Use

1=A condition for which there is no restriction for the use of the contraceptive method.

2=A condition for which the advantages of using the method generally outweigh the theoretical or proven risks.

3=A condition for which the theoretical or proven risks usually outweigh the advantages of using the method.

4=A condition that represents an unacceptable health risk if the contraceptive method is used.

Reprinted from Curtis KM, Tepper NK, Jatlaoui TC, Berry-Bibee E, Horton LG, Zapata LB, et al. U.S. medical eligibility criteria for contraceptive use, 2016. MMWR Recomm Rep 2016;65(RR-3):1–104.

Venous thromboembolism with pulmonary embolism is a major cause of fatalities associated with surgical (including gynecologic) procedures (12). The normalization of clotting factors associated with stopping combined contraceptives is not observed unless discontinuation happens 4–6 weeks before major surgery (13). Health care providers should take into account the planned surgery and other risk factors the patient may have for VTE balanced against the risks of an unintended pregnancy (14–17). Use of combined hormonal contraceptives is contraindicated in patients undergoing major surgery with anticipated prolonged immobilization (USMEC category 4). Otherwise, if patients are expected to be ambulatory postoperatively, there is no reason to stop combined hormonal contraception (USMEC category 2).

Few studies have examined the safety of the combined hormonal contraceptive patch and ring in women with underlying medical conditions. The transdermal patch delivers total ethinyl estradiol serum concentrations that are higher than that seen in women who use oral contraceptive (OC) pills formulated with 30–35 micrograms ethinyl estradiol, although the peak ethinyl estradiol concentrations are lower than in women using such OCs (18, 19). Although the data are conflicting, the risk of VTE associated with the combined hormonal contraceptive patch and ring appears similar to that with combined OCs (20–22). Overall, contraindications to the use of combined OCs for VTE risk also should be considered to apply to the transdermal patch and the vaginal ring.
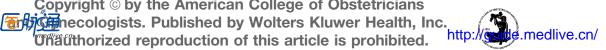
Studies of the estrogen dose of combined hormonal contraceptive pills have demonstrated that reductions in the ethinyl estradiol dose from 50 micrograms to less than 50 micrograms were associated with decreased risk of VTE (23). However, there is no strong evidence that a further reduction to 20 micrograms or 10 micrograms of ethinyl estradiol further reduces the VTE risk because published trials are not sufficiently large to definitively detect differences between the association of these estrogen doses (24, 25) or the type of estrogen (ethinyl estradiol versus estradiol valerate) (26) with rare adverse events such as VTE, myocardial infarction, and stroke (27, 28).

Combined hormonal contraceptives that contain older formulations of progestins (levonorgestrel and norethindrone) and newer progestins (desogestrel and drospirenone in oral contraception and etonogestrel in the vaginal ring) are associated with a comparable risk of VTE and can be recommended as equivalent options to women with a history of or at risk of VTE (9, 29–31). In evaluating this risk, several prospective cohort studies addressed important baseline confounders, including age, family history, and body mass index (BMI); categorized contraceptive users by duration of use; maintained regular contact with users; and individually validated each diagnosis of VTE (21, 32). These studies provide strong evidence that the risk of VTE associated with combined hormonal contraceptives formulated with desogestrel, drospirenone, and etonogestrel is similar to the risk associated with use of methods formulated with older progestins (4, 33).

Progestin-only pills, the contraceptive implant, or an LNG-IUD are appropriate options to initiate in women with a history of or at risk of VTE, myocardial infarction, or stroke (USMEC category 2) (34). However, the data for DMPA are less clear (34–36). A meta-analysis based on two studies found a twofold increased risk of VTE with progestin-only injectables (37). However, residual confounding from this analysis weakens the result (34, 38, 39). The USMEC allows the use of DMPA in women at risk of VTE (USMEC category 2).

The hypoestrogenic effect and increased total cholesterol levels seen in DMPA users (40, 41) result in concern that the risk might outweigh benefit of DMPA use in women with a personal history of ischemic heart disease or stroke (USMEC category 3). Although little concern exists about these effects with regard to progestin-only pills, the subdermal implant, and LNG-IUDs, these methods also become USMEC category 3 for method continuation if a new deep vein thrombosis, ischemic cardiac event, or stroke occur in women already using progestin-only pills, contraceptive implant, or an LNG-IUD. Contraceptive use in women who use anticoagulants because of their risk of VTE or for treatment of VTE is discussed in clinical question, *What hormonal contraceptive options are appropriate for women taking concomitant antiepileptic, antiretroviral, antimicrobial, or anticoagulation therapy?* later in this document.

▶ *Is hormonal contraception safe for women with known thrombogenic mutations? Is routine screening for familial thrombophilias recommended before providing hormonal contraception?*

Use of combined hormonal contraceptives is contraindicated in women with known familial thrombophilias (USMEC category 4) (1). Progestin-only methods and LNG-IUDs are acceptable alternatives for individuals with known thrombogenic mutations (USMEC category 2). Women with thrombophilic syndromes, including factor V Leiden mutation, prothrombin G20210A mutation, protein C, protein S, or antithrombin deficiency have an increased risk of VTE during combined hormonal contraceptive use. They also may develop VTE more rapidly after initiation of combined hormonal contraceptive use than women without familial thrombophilias (42–44). In one study, women with heterozygous factor V Leiden mutation were found to have a baseline risk of VTE sevenfold higher than women without this mutation (45). The risk was more than 15–30 times higher in women heterozygous for the factor V Leiden mutation who used OCs than in women who used nonhormonal contraceptives and were not carriers of the mutation (45, 46).

Gynecologic care providers should not perform routine screening for familial thrombotic disorders before initiating combined hormonal contraceptives (1, 47). Screening would identify approximately 5% of U.S. OC candidates as having factor V Leiden mutation; however, most of these women will never experience VTE even if they used combined OCs (48). Given the rarity of fatal VTE, one group of investigators concluded that screening more than 1 million combined OC candidates for thrombophilic markers would, at best, prevent two OC-associated deaths (49). In addition, assessment of

methylenetetrahydrofolate reductase polymorphisms or measurement of fasting homocysteine levels is not recommended. Although hyperhomocysteinemia was previously believed to be a modest risk factor for VTE (50, 51), more recent data indicate that elevated homocysteine levels are a weak risk factor for VTE (52). And, methylenetetrahydrofolate reductase mutations by themselves do not appear to convey an increased risk of VTE (53).

▶ *Are hormonal contraceptives safe for women with systemic lupus erythematosus?*

Patients with systemic lupus erythematosus (SLE) have an increased risk of arterial and venous thrombosis compared with the general population, with thrombosis being a major cause of death among SLE patients (54). Risk of thromboembolism is further increased by the presence of persistently positive antiphospholipid antibodies (55, 56). Furthermore, young women with SLE have an estimated 50-fold increased risk of myocardial infarction compared with age-matched and sex-matched controls (57). Accordingly, USMEC contraceptive recommendations are stratified according to the presence or absence of certain comorbidities: antiphospholipid antibodies (lupus anticoagulant, anticardiolipin antibody, and anti-β_2-glycoprotein antibody), severe thrombocytopenia, and concomitant immunosuppressive medications (1). Women with SLE should be tested for antiphospholipid antibodies before initiating hormonal contraception (58–60). Combined hormonal contraception is contraindicated in women with SLE and positive antiphospholipid antibodies (USMEC category 4). In other SLE patients, use of combined hormonal contraceptive methods is rated USMEC category 2 in the absence of other cardiovascular disease risk factors (eg, older age, smoking, hypertension, diabetes, and hypercholesterolemia). Use of combined hormonal contraceptives does not appear to worsen SLE disease activity in women with inactive or stable active disease (61). Although progestin-only methods, including LNG-IUDs, are not considered to increase the risk of VTE, they are all rated USMEC category 3 for SLE patients with antiphospholipid antibodies. This is because the propensity for VTE is quite high in general in these patients (62). In SLE patients without antiphospholipid antibodies, progestin-only methods are rated USMEC category 2.

For women with SLE complicated by severe thrombocytopenia (less than 50,000 platelets/microliter), caution exists only for the initiation of DMPA (USMEC category 3). This is because of concerns for menstrual bleeding with severe thrombocytopenia that may be worsened by the irregular bleeding with the initiation of DMPA (1). Many women with SLE take immunosuppressant medications, and LNG-IUDs are demonstrated

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to be safe without increased risk of infection, contraceptive failure, or other adverse events in immunosuppressed women (USMEC category 2) (62–66).

▶ *Which hormonal contraceptives are appropriate for postpartum and breastfeeding women?*

Postpartum women should be offered contraception if rapid repeat pregnancy is not desired. Most nonbreastfeeding women will not ovulate until 6 weeks postpartum, however, some women may experience ovulation as early as 3 weeks postpartum (67). Pregnancy risk is decreased for 6 months at most in exclusively breastfeeding women who do not use formula supplementation and who, therefore, meet criteria for the lactational amenorrhea method of contraception.

Postpartum Venous Thromboembolism Risk

Regardless of breastfeeding status, combined hormonal contraceptives are contraindicated during the first 21 days after giving birth because of the risk of VTE (USMEC category 4); therefore, health care providers should advise against initiating combined hormonal contraceptives during this time. Venous thromboembolism risk decreases postpartum day 21–42, although this risk continues to outweigh contraceptive benefits (USMEC category 3) in women with additional risk factors for VTE (Box 2) (1, 8, 68–73).

For women without other VTE risk factors, eligibility for use of combined hormonal contraceptives from postpartum day 21–30 is dependent upon breastfeeding status (Table 1). Beyond 30 days, women without VTE risk factors can use combined hormonal contraceptives regardless of breastfeeding status. The VTE risk does not return to baseline until 12 weeks postpartum, although the risk after 6 weeks is low (22.1 cases per 100,000 deliveries within 6 weeks versus 3.0 cases per 100,000 deliveries week 7 to week 12) (71).

Nonbreastfeeding Postpartum Women

After 42 days in the postpartum period, there are no restrictions for combined hormonal contraceptives in nonbreastfeeding postpartum women. Progestin-only methods may be used without concern immediately after delivery in women who are not breastfeeding (USMEC category 1). Intrauterine devices are also an option either immediately after placental delivery or as an interval insertion at the postpartum visit (USMEC category 1). A peripartum course complicated by chorioamnionitis, postpartum endometritis, or sepsis makes IUD insertion contraindicated until evaluation by a clinician at the postpartum visit (USMEC category 4) (1, 74, 75).

Breastfeeding Postpartum Women

Breastfeeding influences contraceptive options. Breastfeeding women may use progestin-only contraceptives at any time during the postpartum period and may use combined hormonal methods at 4–6 weeks after giving birth depending on VTE risk factors (76).

The benefits of progestin-only methods generally outweigh the risks in the first 30 days postpartum for breastfeeding women (USMEC category 2) (1, 74, 75). For breastfeeding women who are considering progestin-only methods, there is general agreement that progestin use after the onset of lactogenesis, generally in the first 48–72 hours postpartum, does not affect breastfeeding performance (77). There is a theoretical concern, nevertheless, that initiation of progestin methods immediately after giving birth could preempt lactogenesis given that progesterone withdrawal after delivery of the placenta is thought to be the trigger to prolactin secretion (78, 79). Nevertheless, although long-term data are limited, observational studies of progestin-only contraceptives suggest they have no effect on successful initiation and continuation of breastfeeding or on infant growth and development even when started immediately after giving birth (80).

Data regarding the effect of combined hormonal contraceptives on breastfeeding duration and infant outcomes are limited and inconsistent, with two recent systematic reviews unable to draw firm conclusions (78, 81). On an individual level, some women might be at risk of breastfeeding difficulties, and patient counseling regarding these concerns is warranted. Regardless of VTE risk, the use of combined hormonal contraceptives in breastfeeding women in the first 30 days after giving birth is to be avoided (USMEC category 4 through postpartum day 21 and category 3 through postpartum day 30). After 30 days, combined hormonal contraceptive use is USMEC category 2 for breastfeeding women because the benefits of contraception likely outweigh the theoretical effects on milk supply.

▶ *Which hormonal contraceptives are appropriate for women of older reproductive age (age 40 years and older)? At what age can women stop the use of hormonal contraception?*

Healthy, nonsmoking women without specific risk factors for cardiovascular disease can continue combined hormonal contraception until age 50–55 years (USMEC category 2) (1, 24). There are no contraindications to the use of hormonal contraceptives on the basis of age alone, although age is an important risk factor for many chronic medical conditions, including cardiovascular disease (1).

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Table 1. U.S. Medical Eligibility Criteria for Postpartum Initiation of Hormonal Contraception*

Contraceptive Type	Timing of Initiation	
	Breastfeeding	**Not Breastfeeding**
Combined hormonal contraceptives	During the first 21 days after giving birth (USMEC 4)	During the first 21 days after giving birth (USMEC 4)
	21–29 days after giving birth, regardless of VTE risk (USMEC 3)	21–42 days after giving birth:
	30–42 days after giving birth:	• With other risk factors for VTE (USMEC 3)
	• With other risk factors for VTE (USMEC 3)	• Without other risk factors for VTE (USMEC 2)
	• Without other risk factors for VTE (USMEC 2)	More than 42 days after giving birth (USMEC 1)
	More than 42 days after giving birth (USMEC 2)	
Progestin-only (implants, injectable DMPA, pills)	Less than 30 days after giving birth, regardless of VTE risk (USMEC 2)	Any time, including immediately after giving birth (USMEC 1)
	30–42 days after giving birth, regardless of VTE risk (USMEC 1)	
	More than 42 days after giving birth (USMEC 1)	
IUD-levonorgestrel	Immediately after placental delivery†, unless contraindications exist‡ (USMEC 2)	Immediately after placental delivery†, unless contraindications exist‡ (USMEC 1)
	Up to 4 weeks after giving birth, unless contraindications exist‡ (USMEC 2)	Up to 4 weeks after giving birth, unless contraindications exist‡ (USMEC 2)
	At 4 or more weeks after giving birth (USMEC 1)	At 4 or more weeks after giving birth (USMEC 1)

Abbreviations: DMPA, depot medroxyprogesterone acetate; IUD, intrauterine device; USMEC, U.S. Medical Eligibility Criteria; VTE, venous thromboembolism.

*Before initiation of contraception, the obstetrician–gynecologist or other gynecologic care provider should be reasonably certain that the patient is not pregnant with a new pregnancy.

†Within 10 minutes after placental delivery in vaginal and cesarean births.

‡Immediate postpartum IUD insertion is contraindicated for women in whom uterine infection (ie, peripartum chorioamnionitis, endometritis, or puerperal sepsis) or ongoing postpartum hemorrhage are diagnosed (USMEC category 4).
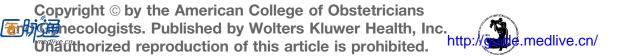
Data from Curtis KM, Tepper NK, Jatlaoui TC, Berry-Bibee E, Horton LG, Zapata LB, et al. U.S. medical eligibility criteria for contraceptive use, 2016. MMWR Recomm Rep 2016;65(RR-3):1–104.

When deciding to stop use of a contraceptive method, the contraceptive and noncontraceptive benefits and the risks of the method must be evaluated in the context of the diminishing risk of pregnancy as the woman ages. It is estimated that the sterility rate is 17% at age 40, 55% by age 45, and 92% by age 50 (82). Routine assessment of follicle-stimulating hormone levels to determine when hormonal contraceptive users have become menopausal and, thus, no longer need contraception may be misleading and is not recommended.

Perimenopausal women may benefit from the positive effect on bone mineral density (83), abnormal uterine bleeding (AUB) (84), and a reduction in vasomotor symptoms (85) offered by combined hormonal contraceptives. In addition, hormonal contraceptive use is associated with a reduced risk of endometrial cancer and ovarian cancer (86), which is of particular importance

to older women of reproductive age and those at increased risk of these types of cancer. However, because age is an independent risk factor for cardiovascular disease and thromboembolism, caution should be used if women have additional risk factors such as smoking, obesity, diabetes, hypertension, or migraine headaches with aura (USMEC category 3–4) (24, 87). Progestin-only OCs, subdermal implant, and LNG-IUDs are options for older women with these cardiovascular risk factors (USMEC category 1–2). Use of a 52-mg LNG-IUD may be particularly effective for the management of perimenopausal bleeding (88, 89). In older women who have been using DMPA long term, it is unknown if bone mineral density levels return to baseline before entering menopause. For this reason, DMPA use is USMEC category 2 in women who are older than 45 years without other risk factors for cardiovascular disease.

▶ **Which hormonal contraceptives are appropriate for women with obesity?**

Women of all weights can get pregnant and no methods of contraception are contraindicated in women with obesity (1, 90). Based on a 2016 Cochrane review, women with obesity can be offered all hormonal contraceptive method options with reassurance that the efficacy of hormonal contraception is not significantly affected by weight (91). This conclusion is supported by a prospective cohort study of 1,523 women that found that the overall risk of unintended pregnancy in women who used the combined hormonal pill, patch, or ring was not significantly different across BMI categories, with an overall range of 8.4–11.0% at 3 years of use (92). This study was not able to evaluate efficacy separately among pill, patch, and ring users. The ability to detect small differences in contraceptive efficacy between women at normal weight and women with obesity may be obscured by adherence issues with short-term methods (93).

Nonetheless, further research is needed to better understand how contraceptive efficacy may be affected by weight, particularly in women with BMIs in the class III category (40 or greater). Pharmacokinetic studies show that, compared with normal weight women, women with obesity require twice as long to reach steady state therapeutic levels of contraceptive steroids when starting the pill or after the hormone-free interval because of changes in clearance (94, 95). It is possible that continuous OC use or using a 30–35-microgram pill compared with a 20-microgram pill may be more effective in women with obesity (96). A large, prospective cohort study of more than 52,000 women reported a slight increase in failure rates of combined OCs in patients with a BMI greater than 35 (hazard ratio of 1.5, 1.3–1.8,

95% CI), adjusting for age, parity, and education (97). However, this difference disappeared when evaluating pill dosages according to a 24/4 regimen compared with a 21/7 regimen. Evidence that evaluated the effectiveness of the patch and vaginal ring among women with obesity is limited, but both provide more effective contraception than barrier methods alone in women with obesity (90, 98, 99).

Combined hormonal contraceptives are rated USMEC category 2 for women with obesity. Although obesity and use of combined hormonal contraceptives represent independent risk factors for VTE (87, 100, 101), the absolute risk of VTE with combined hormonal contraceptives in women with obesity still is less than the risk of VTE during pregnancy and the puerperium in women with obesity (102, 103). Although there is conflicting evidence of an increased risk of acute myocardial infarction or stroke in women with obesity who use combined hormonal contraceptive methods (104), the overall absolute risk of these events in reproductive-aged women is low (24).

Consideration should be given to progestin-only and LNG-IUD methods when counseling women with obesity regarding contraceptive choices, particularly among patients who are older than 35 years. Higher pregnancy rates have not been observed among women who are overweight or obese with use of the 150-mg intramuscular or 104-mg subcutaneous formulations of DMPA (105, 106) or the etonogestrel implant (107). No association has been found between baseline weight and weight gain among adult DMPA users compared with nonusers (108, 109), although the data are mixed for new weight gain in adolescent DMPA users who are obese at the time of DMPA initiation (109–112). Because all LNG-IUDs work locally on the uterus and do not rely on systemic drug levels, their efficacy is not affected by BMI (93). Because women with obesity experience an elevated risk of AUB and endometrial hyperplasia, use of the LNG-IUD or other progestin-containing contraception may provide additional benefit of endometrial stabilization and protection (113, 114).

Women who undergo bariatric surgery that may compromise the absorption of oral medications (Roux-en-Y gastric bypass or biliopancreatic diversion) should not use oral contraception (combined hormonal or progestin-only) because efficacy may be impaired (USMEC category 3). Nonoral methods of contraception can be used without restriction (USMEC category 1) (115). There are no similar concerns for use of oral contraception in women who have had restrictive types of bariatric surgery (vertical banded gastroplasty, laparoscopic adjustable gastric band, or laparoscopic sleeve gastrectomy) (USMEC category 1).

What are the effects of hormonal contraception in women with depressed mood?

Women with depressive disorders can use all methods of hormonal contraception (USMEC category 1) (1) because depressive symptoms do not appear to worsen with use of any method of hormonal contraception, including DMPA (116). Combined hormonal contraceptives use does not modify the effectiveness of fluoxetine (117). Selective serotonin reuptake inhibitors and serotonin norepinephrine reuptake inhibitors do not appear to interact with the metabolism of hormonal contraceptives (117–119). In contrast, a clinical trial found that use of the herbal remedy St. John's wort, a hepatic enzyme inducer that is commonly used as an over-the-counter treatment for depression, increased progestin and estrogen metabolism as well as breakthrough bleeding and the likelihood of ovulation in women using combined OCs

(120, 121). For this reason, concomitant use of St. John's wort is rated USMEC category 2 for combined hormonal contraception, progestin-only pills, and the etonogestrel implant.

Is hormonal contraception safe for women with migraine headaches?

Migraine without aura (Box 3) is the most common subtype of migraine, accounting for 75% of cases. Menstrual migraine is a subtype of migraine without aura that may be treated with extended use of hormonal contraception as a means of minimizing endogenous hormonal fluctuations (122). Aura is the complex of neurologic symptoms, usually visual, that occurs usually before the headache. Aura lasts 5–60 minutes and can present as zigzag lines spreading across the visual field, or sensory symptoms, such as pins and needles, speech disturbances, or motor weakness (123).

Box 3. Diagnostic Criteria for Migraine With and Without Aura

Migraine Without Aura	Migraine With Aura
A. At least five lifetime attacks fulfilling criteria B–D	A. At least two attacks fulfilling criteria B and C
B. Headache attacks lasting 4–72 hours (untreated or unsuccessfully treated)	B. One or more of the following fully reversible aura symptoms:
C. Headache has at least two of the following four characteristics:	1. visual
1. unilateral location	2. sensory
2. pulsating quality	3. speech and/or language
3. moderate or severe pain intensity	4. motor
4. aggravation by or causing avoidance of routine physical activity (eg, walking or climbing stairs)	5. brainstem
D. During headache at least one of the following:	6. retinal
1. nausea or vomiting, or both	C. At least three of the following six characteristics:
2. photophobia and phonophobia	1. at least one aura symptom spreads gradually over ≥5 minutes
E. Not better accounted for by another ICHD-3 diagnosis.	2. two or more aura symptoms occur in succession
	3. each individual aura symptom lasts 5–60 minutes
	4. at least one aura symptom is unilateral
	5. at least one aura symptom is positive (ie, scintillations or pins and needles)
	6. the aura is accompanied, or followed within 60 minutes, by headache
	D. Not better accounted for by another ICHD-3 diagnosis

Abbreviation: ICHD-3, *International Classification of Headache Disorders,* 3rd edition.

Data from *The International Classification of Headache Disorders,* 3rd edition. Headache Classification Committee of the International Headache Society (IHS) Cephalalgia 2018;38:1–211.

At the time of contraceptive initiation, the diagnosis of migraine with or without aura should be carefully considered in all women who present with a history of headache (Box 3). There are no contraindications to the use of any progestin-only method in women with migraines with or without aura (USMEC category 1) (1, 34, 124). Combined hormonal contraceptives can be used in women who have migraine without aura and no other risk factors for stroke (USMEC category 2). Estrogen-containing contraceptives are not recommended for women who have migraine with aura because of the increased risk of stroke (USMEC category 4) (124–127).

Although the absolute risk of ischemic stroke is low in women of reproductive age (128), migraine, particularly migraine with aura (129, 130), increasing age (131), and combined hormonal contraceptive use represent independent risk factors for stroke (132, 133). The risk of stroke among women using combined hormonal contraceptives rises with increasing age from 3.4 events per 100,000 women-years in adolescents to 64.4 events per 100,000 women-years among women aged 45–49 years (24). In a recent case–control study, investigators found that combined hormonal contraceptive use by women with migraines with aura synergistically increased the risk of stroke (134). In contrast, use of combined hormonal contraceptives by women with migraines without aura did not increase the risk over baseline. After adjusting for hypertension, diabetes, obesity, smoking, ischemic heart disease, and valvular heart disease, compared with women with *neither* migraine *nor* combined hormonal contraceptive use, the odds ratio (OR) of ischemic stroke was highest among women with migraine *with* aura *using* combined hormonal contraceptives (adjusted OR, 6.1; 95% CI, 3.1–12.1) and those with migraine *with* aura *not* using combined hormonal contraceptives (adjusted OR, 2.7; 95% CI, 1.9–3.7). In contrast, the risk of ischemic stroke was lower for women with migraine without aura using combined hormonal contraceptives (adjusted OR, 1.8; 95% CI, 1.1–2.9) and for women with migraine without aura not using combined hormonal contraceptives (adjusted OR, 2.2; 95% CI, 1.9–2.7) (134).

▶ *Is the use of hormonal contraception safe for women with chronic hypertension?*

Women with blood pressure (BP) below 140/90 mm Hg may use any hormonal contraceptive method. In women with hypertension of systolic 140–159 mm Hg or diastolic 90–99 mm Hg, combined hormonal contraceptives should not be used unless no other method is appropriate for or acceptable to the patient (USMEC category 3). Women with hypertension of systolic 160 mm Hg or greater or diastolic 100 mg Hg or greater or with vascular

disease should not use combined hormonal contraceptives (USMEC category 4) (1).

The American College of Cardiology and the American Heart Association released a 2017 guideline that provides new BP standards and definitions: normal BP is defined as systolic less than 120 mm Hg and diastolic less than 80 mm Hg; elevated BP is systolic 120–129 mm Hg and diastolic less than 80 mm Hg; hypertension stage 1 is systolic 130–139 mm Hg or diastolic 80–89 mm Hg; and hypertension stage 2 is systolic 140 mm Hg or greater or diastolic 90 mm Hg or greater (135). Although the USMEC was created under previous definitions of hypertension, little data exist to help delineate risk of hormonal contraception in the new definition of hypertension stage 1 (systolic 130–139 mm Hg or diastolic 80–89 mm Hg) compared with women with BP systolic 140 mm Hg or greater or diastolic 90 mm Hg or greater. Therefore, obstetrician–gynecologists and other gynecologic care providers should continue to follow the current USMEC recommendations for women with elevated BP levels.

Although the absolute risk is low, it is estimated that among women using combined hormonal contraceptives, the relative risk of acute myocardial infarction in women with hypertension is increased by a factor of 12 compared with those who are not using combined hormonal contraceptives (136). With regard to contraceptive risk, hypertension USMEC classifications are based on assumptions that no other risk factors exist for cardiovascular disease. When multiple risk factors exist, combined hormonal contraception may increase a patient's cardiovascular disease risk to an unacceptable level (USMEC categories 3 and 4) (1).

Women on antihypertensive medication represent a separate category. Although the risk of cardiovascular disease in women with hypertension adequately controlled with medications should be reduced, there are no data on the use of combined hormonal contraceptives in this population. Therefore, use of combined hormonal contraceptives in these women is USMEC category 3 and requires clinical judgment regarding risk of pregnancy and patient acceptability of progestin-only or nonhormonal contraceptive methods. Women with well-controlled and monitored hypertension who are 35 years or younger may be appropriate candidates for a trial of combined hormonal contraceptives, provided they are otherwise healthy, show no evidence of end-organ vascular disease, and do not smoke cigarettes. If BP remains well controlled with careful monitoring several months after contraceptive initiation, use may be continued.

Contemporary low-dose (35 micrograms or less) combined estrogen–progestin OCs appear to increase BP

in a slight, likely nonclinically significant manner (137): approximately 8 mm Hg systolic and 6 mm Hg diastolic compared with no such increase in women beginning use of a copper IUD (138). Although few women develop overt hypertension after starting combined hormonal contraceptives, BP should be checked at follow-up visits and discontinuation of the hormonal method should be considered if BP increases significantly in the absence of other obvious causes (137, 139).

Use of progestin-only pills does not appear to have a significant effect on BP (140) or cardiovascular disease risk (141). Blood pressure measurement before or during the use of progestin-only pills, DMPA, subdermal implant, or LNG-IUD methods is not necessary (139). Unlike other progestins, the use of DMPA in women with hypertension of systolic 160 mm Hg or greater or diastolic 100 mm Hg or greater is generally not advised because of the theoretical risk of unfavorable lipoprotein changes that could contribute to cardiovascular risk (USMEC category 3) (1). However, the risks and benefits of the method need to be weighed against the risks of adverse pregnancy outcomes in women with hypertension.

▶ *Is the use of hormonal contraception safe for women with diabetes?*

Available data offer reassurance that hormonal contraception does not affect carbohydrate metabolism in women without diabetes and, therefore, is unlikely to precipitate diabetes disease (142). For women with uncomplicated insulin or noninsulin dependent diabetes, no methods of hormonal contraception are contraindicated based on available data (USMEC category 2) (143). However, for women with diabetes of more than 20 years of duration or evidence of microvascular disease (retinopathy, nephropathy, or neuropathy), combined hormonal contraceptives are contraindicated (USMEC category 3 or 4 depending on the severity of the condition) (1). Because DMPA increases lipoprotein profiles favorable to atherosclerosis (40, 144), DMPA also is given a USMEC category 3 rating for women with diabetes of more than 20 years' duration or evidence of microvascular disease for fear of compounding already existing cardiovascular disease. The progestin-only pill, LNG-IUDs, and subdermal implant are suitable alternatives for this population.

▶ *Is use of hormonal contraception appropriate for women at elevated risk of breast and ovarian cancer?*

Gynecologic care providers need not restrict use of any hormonal contraception in women with a family history

of breast cancer (USMEC category 1) or women with identified mutations in breast cancer susceptibility genes (eg, *BRCA1* and *BRCA2*) who have not personally been diagnosed with breast cancer (1, 145, 146). Women with a family history of breast cancer (often defined as having two or more close relatives with this malignancy) have a twofold to threefold elevated risk of breast cancer compared with women without such a family history (147). A systematic review identified 10 individual studies and one pooled analysis of 54 studies published between 1966 and 2008 that assessed risk of breast cancer with respect to combined hormonal contraceptive use and family history. Overall, this review concluded that use of OCs does not significantly affect risk of breast cancer in women with a family history of this disease (148). Similarly, in a 2013 systematic review and meta-analysis of *BRCA1* and *BRCA2* mutation carriers, OC use showed an increased but nonsignificant association with breast cancer (OR, 1.21; 95% CI, 0.93–1.58) and a significant inverse association with ovarian cancer (OR, 0.58; 95% CI, 0.46–0.73) (149). Studies also suggested stronger protection against ovarian cancer with longer duration of combined hormonal contraceptive use. Findings were similar when *BRCA1* and *BRCA2* mutations were examined separately (149, 150).

▶ *What hormonal contraceptive options are appropriate for women with a history of breast or gynecologic cancer, including gestational trophoblastic disease?*

Breast Cancer
Many cases of breast cancer are hormonally sensitive. Accordingly, there are theoretic concerns that use of combination estrogen–progestin or progestin-only contraception, including the LNG-IUD, may worsen the prognosis of women who have been treated for breast cancer (USMEC category 4 for current or recent breast cancer and category 3 for no evidence of disease for 5 years or more) (1, 151). Gynecologic care providers can recommend the use of the copper IUD as an appropriate contraceptive option for women who have been treated for breast cancer (USMEC category 1).

Commonly used to reduce recurrence risk in premenopausal breast cancer survivors, tamoxifen increases risk of endometrial polyps and AUB (152). Off-label use of the 52-mg LNG-IUD significantly reduces the risk of endometrial polyps in this setting (153). The effect of using LNG-IUDs on recurrence risk in breast cancer patients is uncertain. One study of 79 premenopausal breast cancer patients who used a 52-mg LNG-IUD and 120 patients who did not use this contraceptive found that,

overall, with a mean follow-up of 2.8 years, the recurrence rate was similar among survivors who did and did not use the LNG-IUD (154). However, among those women who were using the LNG-IUD at the time of breast cancer diagnosis and continued use of this IUD, risk of recurrence was elevated from 16.6% to 21.5%, with this higher risk achieving marginal statistical significance. One limitation of this observational study is the possibility that women who did not use the LNG-IUD may have used OCs or other hormonal methods of birth control. Decisions regarding use of LNG-IUDs in breast cancer survivors should balance the unknown risk of recurrence against its potential benefit on a case-by-case basis. Consultation with the patient's medical oncologist can be useful in these cases.

Gynecologic Cancer

Screening for cervical cancer in patients without signs or symptoms should not be required before the provision of contraception (155). Women in whom cervical, endometrial, or ovarian cancer is diagnosed often have subsequent gynecologic surgery that obviates the need for contraception due to resulting surgical sterility. However, while a patient is awaiting surgical treatment or if sterility does not result from treatment of the gynecologic cancer, use of combined hormonal or progestin-only contraception, including continuation of a previously placed LNG-IUD, is appropriate (USMEC category 1 or 2) (1). For those patients with endometrial hyperplasia or malignancy who are not surgical candidates or who decline surgery, a progestin-based method, particularly DMPA and the 52-mg LNG-IUD, may be used (156, 157).

Gestational Trophoblastic Disease

Chronic monitoring of human chorionic gonadotropin (hCG) levels represents a key component of care after women have been treated for gestational trophoblastic disease. Accordingly, effective contraception is important to minimize the risk of a new pregnancy that could confound the recovery from gestational trophoblastic disease. For women who have been treated for gestational trophoblastic disease with suction curettage, if hCG levels are falling or undetectable or if hCG levels are elevated but intrauterine disease is not evident or suspected, any hormonal method of contraception is considered appropriate (USMEC category 1 or 2) (1). However, because of concerns regarding possible bleeding, infection, or perforation, placement of a new IUD is not appropriate in women with gestational trophoblastic disease for whom there is persistently elevated hCG levels or malignant disease when intrauterine disease is evident or suspected (USMEC category 4) (158).

▶ *What hormonal contraceptive options are appropriate for women taking concomitant antiepileptic, antiretroviral, antimicrobial, or anticoagulation therapy?*

Women taking rifampin and liver-enzyme inducing antiepileptic and antiretroviral medications that interfere with contraceptive steroid efficacy can use DMPA and LNG-IUDs without concern for increased contraceptive failure (USMEC category 1). Combined hormonal contraception or progestin-only pills generally are not recommended because of the increased risk of contraceptive failure (USMEC category 3). The efficacy of the etonogestrel implant also may be susceptible to medications that interfere with contraceptive steroids (USMEC category 2).

Antiepileptic Drugs

Epilepsy represents a chronic condition that warrants effective contraception as part of the medical care plan because seizure activity worsens during pregnancy (159), negatively affecting maternal and fetal outcomes (160). Furthermore, fetal antiepileptic drug exposure is associated with a twofold to threefold increased risk of major congenital malformations compared with the general population, with even higher rates reported with valproate or polytherapy use (161).

Several antiepileptic drugs induce hepatic enzymes (Box 4), which can result in decreased serum concentrations of one or both of the estrogen or progestin components of hormonal contraceptives, putting women at risk of contraceptive failure and unintended pregnancy (162); accordingly, use of combined hormonal contraceptives in the setting of hepatic enzyme-inducing antiepileptic drugs is classified as USMEC category 3. Although studies demonstrate reduced serum levels of OC steroids during use of hepatic enzyme-inducing antiepileptic drugs and associated breakthrough ovulation (163, 164) or bleeding (163–167), investigators did not assess for accidental pregnancy during anticonvulsant use. If combined hormonal contraceptives are used in combination with antiepileptics that reduce steroid levels, combined hormonal contraceptive efficacy may be improved with formulations that contain 30–35 micrograms rather than lower doses of ethinyl estradiol (1), progestins known to have a longer half-life (drospirenone, desogestrel, levonorgestrel), and with hormone-free intervals shorter than 7 days to minimize the risk of escape ovulation (97, 168). Minimal data are available that examine the use of vaginal rings or transdermal patches with concomitant use of antiepileptic drugs. Serum norethindrone levels during use of progestin-only pills are lower than during use of combined OCs. Accordingly, use of progestin-only pills with antiepileptic drugs that induce

hepatic enzymes is rated USMEC category 3 because of the risk of pregnancy.

Depot medroxyprogesterone acetate and IUDs represent two preferred contraceptives for women taking liver enzyme-inducing antiepileptic drugs (USMEC category 1). Progestin levels are high with DMPA; 150 mg intramuscularly every 3 months represents a dose substantially higher than needed to suppress ovulation. Therefore, of all the systemic hormonal contraceptives, DMPA should be the method most likely to maintain contraceptive efficacy with concomitant use of liver enzyme-inducing anticonvulsants, though no pharmacodynamic studies are available to demonstrate this (168).

Box 4. Classification of Antiepileptic Drugs

Liver Enzyme Inducers

- Carbamazepine
- Felbamate
- Oxcarbazepine
- Phenobarbital
- Phenytoin
- Primidone
- Rufinamide

Noninducers of Liver Enzymes

- Clobazam
- Clonazepam
- Ethosuximide
- Ezogabine
- Gabapentin
- Lacosamide
- Lamotrigine*
- Levetiracetam
- Pregabalin
- Tiagabine
- Topiramate†
- Valproate
- Vigabatrin
- Zonisamide

*Lamotrigine does not affect levels of ethinyl estradiol. Although lamotrigine lowers Cmax, area under the curve, and trough levels of the progestin levonorgestrel, the changes are very small and unlikely to affect efficacy.

†Topiramate given at a dose of 200 mg a day does not affect levels of norethindrone. Topiramate decreases area under the curve and Cmax, but not trough levels, of ethinyl estradiol when given at a dose of 200 mg a day.

Adapted from Davis AR, Pack AM, Dennis A. Contraception for women with epilepsy. In: Allen RH, Cwiak CA, editors. Contraception for the medically challenging patient. New York (NY): Springer; 2014. p. 135–6.

The contraceptive efficacy of a 52-mg LNG-IUD has been observed to remain high with concomitant use of antiepileptic and other liver enzyme-inducing medications (169). A pharmacokinetic study indicates decreased serum levels of etonogestrel in women taking carbamazepine (170), and there are case reports of pregnancy occurring in women using the implant while taking enzyme-inducing antiepileptic medications (171, 172). However, because the etonogestrel implant is so effective at preventing pregnancy in general, the risk of contraceptive failure likely remains quite low in comparison with other contraceptive methods. This method is, therefore, rated USMEC category 2 for women on enzyme-inducing antiepileptic medications.

Lamotrigine is the only antiepileptic medication known to have its metabolism affected by estrogen-containing contraceptives, which reduces lamotrigine serum levels with concomitant use (173, 174). Therefore, dose adjustments of lamotrigine may be needed if hormonal contraceptives are used concomitantly and lamotrigine levels may increase during the hormone-free intervals.

Antimicrobial and Antiretroviral Therapy

Rifampin and rifabutin, two antimycobacterial drugs in the rifamycin class, appear to affect the metabolism of estrogen and progestin and have pharmacokinetic evidence of lower serum steroid levels, which may affect contraceptive efficacy (175–178). However, all other broad-spectrum antibiotics, antifungals, and antiparasitics do not interfere with OC efficacy (1, 178, 179). Theoretically, several antiretroviral medications may affect the metabolism of estrogen and progestin, although all but fosamprenavir can be taken with concomitant use of all hormonal birth control methods (USMEC category 1 or 2) (1, 2). Pharmacokinetic studies have not demonstrated decreased OC steroid levels with concomitant use of tetracycline, doxycycline, ampicillin, metronidazole, or quinolone antibiotics (180). A pharmacokinetic study noted that concomitant use of fluconazole does not decrease steroid levels in women who used combined OCs (181). Trials of women who used the contraceptive vaginal ring noted that contraceptive steroid levels were not reduced by ampicillin, doxycycline, or single or multiple administration of nonprescription vaginal miconazole suppositories or cream (182, 183). Data are limited but, theoretically, because broad-spectrum antibiotics do not affect efficacy of OC pills, it is likely that they also do not affect the efficacy of the contraceptive patch. One study demonstrated a short course of tetracycline did not affect the pharmacokinetics of norelgestromin or ethinyl

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estradiol in patients who used the contraceptive patch (184).

The efficacy of progestin-only pills (USMEC category 3) and the etonogestrel subdermal implant (USMEC category 2) is likely to be decreased with concomitant use of rifampin. There is no evidence that the efficacy of DMPA or the LNG-IUD decreases with rifampin (185), and these contraceptives should be encouraged for women using rifampin or rifabutin long-term (USMEC category 1).

Anticoagulants

All progestin-only methods are acceptable for women taking anticoagulants (USMEC category 2). Women using warfarin or other medications for chronic anticoagulation may experience heavy menstrual bleeding and, rarely, hemoperitoneum after rupture of ovarian cysts. In addition, warfarin is a teratogen and women on this medication should have access to reliable contraception. Methods studied to treat heavy menstrual bleeding induced by anticoagulation therapy include the 52-mg LNG-IUD and DMPA, with DMPA having the added benefit of preventing ovarian cyst formation and rupture (186). Evidence, although limited, has not revealed intramuscular DMPA injection site problems, such as hematoma in women taking anticoagulants (187). Because the 52-mg LNG-IUD provides effective contraception and significantly reduces menstrual blood loss, it is an excellent contraceptive method for patients taking anticoagulants (186, 188, 189). Use of combined hormonal contraceptives also can reduce menstrual blood loss (88, 190) but is associated with an increased risk of VTE. Because the risk of recurrent thrombosis is low in women on therapeutic anticoagulation, the use of combined contraceptives can be considered for such women on a case-by-case basis, especially if alternative methods are not acceptable to the woman or are contraindicated (USMEC category 3) (191).

Summary of Recommendations

The following recommendations are based on good and consistent scientific evidence (Level A):

▶ Women with certain conditions associated with VTE should be counseled for nonhormonal or progestin-only contraceptives.

▶ Gynecologic care providers should not perform routine screening for familial thrombotic disorders before initiating combined hormonal contraceptives.

▶ Use of combined hormonal contraceptives is contraindicated in women with known familial thrombophilias (USMEC category 4). Progestin-only methods and LNG-IUDs are acceptable alternatives for individuals with known thrombogenic mutations (USMEC category 2).

▶ Women with SLE should be tested for antiphospholipid antibodies before initiating hormonal contraception. Combined hormonal contraception is contraindicated in women with SLE and positive antiphospholipid antibodies (USMEC category 4).

▶ Regardless of breastfeeding status, combined hormonal contraceptives are contraindicated during the first 21 days after giving birth because of the risk of VTE (USMEC category 4); therefore, health care providers should advise against initiating combined hormonal contraceptives during this time. Venous thromboembolism risk decreases postpartum day 21–42, although this risk continues to outweigh contraceptive benefits (USMEC category 3) in women with additional risk factors for VTE.

▶ At the time of contraceptive initiation, the diagnosis of migraine with or without aura should be carefully considered in all women who present with a history of headache.

▶ Combined hormonal contraceptives can be used in women who have migraine without aura and no other risk factors for stroke (USMEC category 2). Estrogen-containing contraceptives are not recommended for women who have migraine with aura because of the increased risk of stroke (USMEC category 4).

▶ Women with blood pressure below 140/90 mm Hg may use any hormonal contraceptive method. In women with hypertension of systolic 140–159 mm Hg or diastolic 90–99 mm Hg, combined hormonal contraceptives should not be used unless no other method is appropriate for or acceptable to the patient (USMEC category 3). Women with hypertension of systolic 160 mm Hg or greater or diastolic 100 mg Hg or greater or with vascular disease should not use combined hormonal contraceptives (USMEC category 4).

▶ For women with uncomplicated insulin or non-insulin dependent diabetes, no methods of hormonal contraception are contraindicated based on available data (USMEC category 2). However, for women with diabetes of more than 20 years of duration or evidence of microvascular disease (retinopathy, nephropathy, or neuropathy), combined hormonal contraceptives are contraindicated (USMEC category 3 or 4 depending on the severity of the condition).

The following recommendations are based on limited or inconsistent scientific evidence (Level B):

▶ Combined hormonal contraceptives that contain older formulations of progestins (levonorgestrel and norethindrone) and newer progestins (desogestrel and drospirenone in oral contraception and etonogestrel in the vaginal ring) are associated with a comparable risk of VTE and can be recommended as equivalent options to women with a history of or at risk of VTE.

▶ Progestin-only pills, the contraceptive implant, or an LNG-IUD are appropriate options to initiate in women with a history of or at risk of VTE, myocardial infarction, or stroke (USMEC category 2).

▶ Breastfeeding women may use progestin-only contraceptives at any time during the postpartum period and may use combined hormonal methods at 4–6 weeks after giving birth depending on VTE risk factors.

▶ Women with obesity can be offered all hormonal contraceptive method options with reassurance that the efficacy of hormonal contraception is not significantly affected by weight.

▶ Women with depressive disorders can use all methods of hormonal contraception (USMEC category 1) because depressive symptoms do not appear to worsen with use of any method of hormonal contraception, including DMPA.

▶ Gynecologic care providers need not restrict use of any hormonal contraception in women with a family history of breast cancer (USMEC category 1) or women with identified mutations in breast cancer susceptibility genes (eg, *BRCA1* and *BRCA2*) who have not personally been diagnosed with breast cancer.

▶ Women taking rifampin and liver-enzyme inducing antiepileptic and antiretroviral medications that interfere with contraceptive steroid efficacy can use DMPA and LNG-IUDs without concern for increased contraceptive failure (USMEC category 1). Combined hormonal contraception or progestin-only pills generally are not recommended because of the increased risk of contraceptive failure (USMEC category 3).

The following recommendations are based primarily on consensus and expert opinion (Level C):

▶ Healthy, nonsmoking women without specific risk factors for cardiovascular disease can continue combined hormonal contraception until age 50–55 years (USMEC category 2).

▶ Routine assessment of follicle-stimulating hormone levels to determine when hormonal contraceptive users have become menopausal and, thus, no longer need contraception may be misleading and is not recommended.

▶ Women who undergo bariatric surgery that may compromise the absorption of oral medications (Roux-en-Y gastric bypass or biliopancreatic diversion) should not use oral contraception (combined hormonal or progestin-only) because efficacy may be impaired (USMEC category 3). Nonoral methods of contraception can be used without restriction (USMEC category 1).

▶ Gynecologic care providers can recommend the use of the copper IUD as an appropriate contraceptive option for women who have been treated for breast cancer (USMEC category 1).

▶ Decisions regarding use of LNG-IUDs in breast cancer survivors should balance the unknown risk of recurrence against its potential benefit on a case-by-case basis. Consultation with the patient's medical oncologist can be useful in these cases.

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The MEDLINE database, the Cochrane Library, and the American College of Obstetricians and Gynecologists' own internal resources and documents were used to conduct a literature search to locate relevant articles published between January 2000–July 2018. The search was restricted to articles published in the English language. Priority was given to articles reporting results of original research, although review articles and commentaries also were consulted. Abstracts of research presented at symposia and scientific conferences were not considered adequate for inclusion in this document. Guidelines published by organizations or institutions such as the National Institutes of Health and the American College of Obstetricians and Gynecologists were reviewed, and additional studies were located by reviewing bibliographies of identified articles. When reliable research was not available, expert opinions from obstetrician–gynecologists were used.

Studies were reviewed and evaluated for quality according to the method outlined by the U.S. Preventive Services Task Force:

I   Evidence obtained from at least one properly designed randomized controlled trial.

II-1 Evidence obtained from well-designed controlled trials without randomization.

II-2 Evidence obtained from well-designed cohort or case–control analytic studies, preferably from more than one center or research group.

II-3 Evidence obtained from multiple time series with or without the intervention. Dramatic results in uncontrolled experiments also could be regarded as this type of evidence.

III Opinions of respected authorities, based on clinical experience, descriptive studies, or reports of expert committees.

Based on the highest level of evidence found in the data, recommendations are provided and graded according to the following categories:

Level A—Recommendations are based on good and consistent scientific evidence.

Level B—Recommendations are based on limited or inconsistent scientific evidence.

Level C—Recommendations are based primarily on consensus and expert opinion.

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