Contraceptive Challenges in Women With Common Medical Conditions

Mary L. Marnach, MD; Cassandra J. Gave, DNP, APRN, CNP; and Petra M. Casey, MD

From the Department of Obstetrics & Gynecology, Mayo Clinic, Rochester, MN.

CME Activity

Target Audience: The target audience for *Mayo Clinic Proceedings* is primarily internal medicine physicians and other clinicians who wish to advance their current knowledge of clinical medicine and who wish to stay abreast of advances in medical research.

Statement of Need: General internists and primary care physicians must maintain an extensive knowledge base on a wide variety of topics covering all body systems as well as common and uncommon disorders. *Mayo Clinic Proceedings* aims to leverage the expertise of its authors to help physicians understand best practices in diagnosis and management of conditions encountered in the clinical setting.

Accreditation: In support of improving patient care, Mayo Clinic College of Medicine and Science is jointly accredited by the Accreditation Council for Continuing Medical Education (ACCME), the Accreditation Council for Pharmacy Education (ACPE), and the American Nurses Credentialing Center (ANCC) to provide continuing education for the health care team.

Credit Statement: Mayo Clinic College of Medicine and Science designates this journal-based CME activity for a maximum of 1.0 *AMA PRA Category 1 Credit(s).*™ Physicians should claim only the credit commensurate with the extent of their participation in the activity.

MOC Credit Statement: Successful completion of this CME activity, which includes participation in the evaluation component, enables the participant to earn up to 1 MOC point in the American Board of Internal Medicine's (ABIM) Maintenance of Certification (MOC) program. Participants will earn MOC points equivalent to the amount of CME credits claimed for the activity. It is the CME activity provider's responsibility to submit participant completion information to ACCME for the purpose of granting ABIM MOC credit.

Learning Objectives: On completion of this article, the reader should be able to: 1) define the four categories of method suitability as defined by the US Medical Eligibility Criteria for Contraceptive Use; 2) review timely issues in contraception, current contraceptive methods, and typical failure rates; and 3) discuss safe methods of contraception for common medical conditions.

Disclosures: As a provider accredited by ACCME, Mayo Clinic College of Medicine and Science (Mayo School of Continuous Professional Development) must ensure balance, independence, objectivity, and scientific rigor in its educational activities. Course Director(s), Planning Committee members, Faculty, and all others who are in a position to control the content of this educational activity are required to disclose all relevant financial relationships with any commercial interest related to the subject matter of the educational activity. Safeguards against commercial bias have been put in place. Faculty also will disclose any off-label and/or investigational use of pharmaceuticals or instruments discussed in their presentation. Disclosure of this information will be published in course materials so that those participants in the activity may formulate their own judgments regarding the presentation.

In their editorial and administrative roles, Karl A. Nath, MBChB, Terry L. Jopke, Kimberly D. Sankey, and Jenna M. Pederson, have control of the content of this program but have no relevant financial relationship(s) with industry. Dr Casey has Grant/Research Support (secondary investigators need not disclose) from Merck for RCT nexplanon-related bleeding. The other authors report no competing interests. Off-label drugs include: Levonorgestrel IUD/Mirena/Lilleta used for hormone therapy in menopause; (Bayer, Allergan/Medicine).

Method of Participation: In order to claim credit, participants must complete the following:

1. Read the activity.
2. Complete the online CME Test and Evaluation. Participants must achieve a score of 80% on the CME Test. One retake is allowed.

Visit www.mayoclinicproceedings.org, select CME, and then select CME articles to locate this article online to access the online process. On successful completion of the online test and evaluation, you can instantly download and print your certificate of credit.

Estimated Time: The estimated time to complete each article is approximately 1 hour.

Hardware/Software: PC or MAC with Internet access.

Date of Release: 11/2/2020

Expiration Date: 10/31/2022 (Credit can no longer be offered after it has passed the expiration date.)

Privacy Policy: http://www.mayoclinic.org/global/privacy.html

Questions? Contact dletcsupport@mayo.edu.

Abstract

Women have the opportunity to meet personal contraceptive goals with convenient, highly reliable, and easily reversible methods. Long-acting reversible contraception represents an increasingly popular option for most women throughout the reproductive lifespan. Nonetheless, many women and their health care providers are challenged by coexisting medical issues. We aim to help clinicians individualize contraception and use shared decision-making to enhance patient satisfaction and continuation with their method.

 ■ Mayo Clin Proc. 2020;95(11):2525-2534

Contraceptive choice is personal, requiring careful consideration and comfort. Women with coexisting health issues require a comprehensive assessment and plan for safe, effective contraception using shared decision-making. The Centers for Disease Control and Prevention (CDC) has published the

United States Medical Eligibility Criteria for Contraceptive Use (USMEC) which includes evidence-based recommendations for contraceptive management in women with coexisting medical conditions.[1] While it does not replace individualized management, the USMEC classifies method suitability from category 1 to 4 as follows: (1) no restrictions in use; (2) advantages generally outweigh the theoretical or proven risks; (3) theoretical or proven risks usually outweigh the advantages; or (4) unacceptable health risk (should not to be used).[1] Complementary to the USMEC is the 2016 US Selected Practice Recommendations for Contraceptive Use (USSPR) which addresses a select group of common yet potentially controversial or complex issues regarding contraception initiation and use.[2] The USSPR serves as an evidence-based clinical guidance to providers. Also complementary to the USMEC and USSPR are the Quality Family Planning Services which provide for contraceptive counseling/family planning to achieve desired timing of childbirth and infant outcomes.[2,3] A useful app updated in 2020, developed from the CDC Morbidity and Mortality Weekly Report by the Division of Reproductive Health covering medical conditions (USMEC) and numerous clinical scenarios (USSPR), assists clinicians in counseling women and their partners about contraceptive options and use.[1,2] Ongoing education using the USMEC assists in the development of evidence-based training bridging knowledge gaps to deliver high-quality contraceptive care.[4]

TIMELY ISSUES IN CONTRACEPTION

Since publication of the original USMEC in 2016, contraceptive experts systematically reviewed timely issues including mood, obesity, heart disease, venous thromboembolism (VTE), injectable contraceptives in adolescents, opioids, and antibiotics. For example, limited evidence found no consistent associations between hormonal contraceptives and postpartum depression.[5] Data showed absolute differences in combined oral contraceptives (COCs) failure by weight and body mass index (BMI) to be small but there was decreased efficacy of the contraceptive patch in the setting of increasing BMI.[6] Women with a history of heart failure can use long-acting reversible contraception (LARC) or permanent sterilization whereas those with a history of uncomplicated cardiac transplantation may use most forms of contraception.[7] In complicated cardiac transplantation, combined hormonal contraceptives (CHCs) and de novo intrauterine system (IUS) insertion are discouraged.[7] In reviewing venous thrombosis among COC users, it is noted that the use of progestogen containing COCs other than levonorgestrel could be associated with a small increased risk of VTE.[8] More than 95% of public-sector providers and office-based physicians consider depomedroxyprogesterone acetate (DMPA) safe for adolescents with only 64% to 89% prescribing DMPA based on factors such as medical specialty, working in settings without government funding, whether offering family planning services, timing of completing medical training, and patient preference for another method.[9] Women can use opioids and contraception with little concern for interactions.[10] Evidence from clinical and pharmacokinetic studies does not support the existence of drug interactions between hormonal contraceptives and non-rifamycin antibiotics.[11]

CURRENT CONTRACEPTIVE USE

For young, nulliparous women and reproductive women between pregnancies or who have completed childbearing, LARC should be the first consideration, with associated US Food and Drug Administration–approved lifespan, including levonorgestrel (LNG) IUS Mirena 52 mg (5 years), Liletta 52 mg (6 years), Kyleena 19.5 mg (5 years), and Skyla 13.5 mg (3 years), the copper TCu380A intrauterine device (IUD) Paragard (10 years), and etonogestrel subdermal implant Nexplanon (3 years).[12] Reported failure rates yearly are 0.05% to 0.8%. Nearly 1 in 4 postpartum women (22.5%) report use of LARC.[13] Factors that affect use of LARC include age, race/ethnicity, education, insurance, parity, intendedness of recent pregnancy, and postpartum visit attendance.[13] Postpartum

Mayo Clin Proc. ■ November 2020;95(11):2525-2534 ■ https://doi.org/10.1016/j.mayocp.2020.08.045
www.mayoclinicproceedings.org

sterilization, an option when childbirth is complete, is also highly effective (0.5% failure rate).[2] In the 65% of women aged 15 to 49 years using contraception, sterilization is used by 18.6%, oral contraceptive pill by 12.6%, and male condoms by 8.7%.[14]

Injections and CHC (including estrogen and progestin pills, ring, and patch) have failure rates of 6% to 9% with typical use.[2] Barrier methods (condoms, diaphragm, cervical cap, and sponge) and fertility awareness methods have reported failure rates of 12% to 28%.[2]

This evidence-based review focuses on common medical conditions that can make contraception choices challenging for women and clinicians. Although barrier and other methods are less efficacious than LARC, for some women they may be more acceptable and should be included in discussion regarding shared decision-making. We will discuss contraceptive methods for each condition, listing the methods from most to least effective with typical use.

COMMON MEDICAL CONDITIONS

Cardiac Disease/Hypertension/Diabetes

Approximately 1 in 16 women older than 19 years have coronary artery disease whereas approximately 5.6% of women aged 18 to 39 years and 29.4% of those aged 40 to 59 years have hypertension.[15] The prevalence of controlled hypertension is 48.3%.[15] Diabetes affects 15 million women in the United States.[15] Levonorgestrel (LNG) IUS and TCu380A IUD (together intrauterine contraception [IUC]) are category 1-2 for cardiac disease.[1] The LNG IUS and implant are category 3 for continuation in ischemic heart disease given the theoretical concern of progestins on lipids.[1] Intrauterine contraception and implant are category 1 for complicated and uncomplicated valvular heart disease and category 1-2 in diabetes and hypertension.[1,16] Depot medroxyprogesterone acetate (DMPA) is category 1 for valvular heart disease and category 3 for ischemic disease, category 1-2 in diabetes and hypertension with category 3 in vascular disease.[1] Progestin-only pill (POP) is category 1 in valvular disease, category 2-3 in ischemic heart disease, and category 1-2 in diabetes and hypertension.[1] Certain progestin-only contraceptives (POP and DMPA) may increase the risk for thrombosis, although this risk is less than with combined hormonal contraceptives (CHCs).[1,17] The effects of DMPA may persist for some time after discontinuation.[1,17] CHC are category 3 for uncomplicated valvular disease, blood pressure less than 140 to 159/90 to 99 mm Hg, diabetes without vascular disease and category 4 for a history of multiple risk factors for arterial cardiovascular disease including smokers older than 35 years (15 or more cigarettes daily), women with long-term diabetes or with vascular complications, uncontrolled hypertension, previous myocardial infarction (MI) or cerebrovascular accident (CVA), known ischemic heart or cerebrovascular disease, or complicated valvular heart disease (pulmonary hypertension, risk for atrial fibrillation, and history of subacute bacterial endocarditis).[1,17,18] No data exist, but CHC users with adequately controlled and monitored hypertension should be at reduced risk for acute MI and CVA compared with untreated hypertensive CHC users.[1] In women with hypertension, COC users were at higher risk than nonusers for CVA, acute MI, and peripheral arterial disease.[17,18] With hyperlipidemia, CHC is category 2-3.[1] It may be beneficial for women with complex cardiac disease, diabetes, and hypertension to be referred to subspecialty care by cardiologists, nephrologists, and gynecologists.

Venous Thromboembolism

Approximately 5% to 8% of the US population has one or more inherited thrombophilias, increasing the risk for thrombosis.[15] As many as 900,000 people in the United States yearly may be affected by VTE (1-2/1000) with 60,000 to 100,000 dying of VTE yearly.[15] IUS and implant are category 1-2 for VTE.[1] In a case-controlled study, DMPA had an odds ratio of 2.2 for VTE whereas LNG IUS, implant, and POP did not show an increased risk.[19] The USMEC classifies all progestin only methods as category 2 given that pregnancy confers a much greater risk for VTE.

Routine screening for inherited or acquired thrombophilias is not necessary because of the rarity of the conditions and cost of screening.[1] Screening women with a family history of a specific thrombophilia is reasonable.[1] CHC is category 3 with a history of VTE at low risk for recurrence (eg, postoperative).[1] Combined hormonal contraceptives (so are category 4 with a current VTE, history of VTE with a risk for recurrence (eg, current malignancy), known thrombogenic mutation(s), or upcoming major surgery with prolonged immobilization.[1]

Anticoagulation/Bleeding Diathesis

Bleeding disorders affect approximately 1% of US women and often lead to heavy menses.[15] Levonorgestrel IUS can be useful to induce amenorrhea while supplying contraception for a known or suspected bleeding diathesis (ie, von Willebrand disease) or during anticoagulation (category 1).[1,12,20] Any LNG IUS (52 mg, 19.5 mg, and 13.5 mg) can be used, but there may be more breakthrough or persistent menses with lower-dose LNG IUS.[12] TCu380A IUD, implant, DMPA, and POP are category 1-2. Combined hormonal contraceptives are category 1 for irregular or heavy menses. Combined hormonal contraceptives may be of benefit beyond contraception for women at risk for VTE who use anticoagulation and are at risk of heavy menses.[21] Use should be individualized. For thalassemias and sickle cell disease, all methods are category 1-2.[1] Fewer sickle cell crises and fewer anemias have been reported with progestin-only contraceptives, especially DMPA.[22]

Liver Disease

Liver disease affects approximately 4.5 million Americans yearly.[15] The number of deaths from liver disease is greater than 41,000 yearly.[15] TCu380A IUD is category 1 in severe liver cirrhosis, hepatocellular adenoma, and malignant hepatoma.[1] Levonorgestrel IUS, implant, DMPA, and POP are category 3 in severe liver disease.[1] Combined hormonal contraceptives are category 4 in women with severe (decompensated) cirrhosis, hepatocellular adenoma, or malignant hepatoma.[1] For focal nodular hyperplasia (benign), all hormonal contraceptives are category 1-2, whereas for mild (compensated) cirrhosis, all hormonal methods are category 1.[1] In acute hepatitis, IUC, implant, DMPA, and POP are category 1.[1] Combined hormonal contraceptives are category 3-4 for an acute flare of hepatitis but category 2 if already being used. For chronic hepatitis, all methods are category 1.[1] With a history of pregnancy-related cholestasis, CHC is category 2 with other methods category 1.[1] With a history of cholestasis related to estrogen, CHC is category 3.[1] When gallbladder disease is a current issue or is being medically treated, CHC is category 3 whereas other methods are category 1-2.[1]

Inflammatory Bowel Disease

Crohn disease and ulcerative colitis affect 1.3% of the US population.[15] Intrauterine contraceptives and implant are category 1 with DMPA and POP being category 2.[1] Although CHC has been associated with an increased risk for Crohn disease and ulcerative colitis, causation has not been demonstrated.[23] Combined hormonal contraceptives may be continued in women with stable bowel disease (category 2-3).[1]

Common Connective Tissue Diseases

Rheumatoid arthritis (RA) is the most common autoimmune arthritis and affects more than 1.5 million Americans with 75% of RA in women.[24] Intrauterine contraceptives, implant, POP, and CHC are category 1-2 in women on immunosuppressive therapy.[1] Depot medroxyprogesterone acetate is category 2-3 in women with RA on immunosuppressives.[1] In RA not requiring immunosuppression all methods are category 1-2.[1]

It is estimated that 1.5 million Americans have systemic lupus erythematosus (SLE) with 90% being women and the disease often diagnosed between the ages 15 and 44 years.[15] In the setting of SLE with known or suspected antiphospholipid antibody syndrome (APAS), TCu380A IUD is category 1.[1,25] Levonorgestrel IUS, implant, and POP are category 3 in known or suspected APAS, and CHC is category 4 in APAS.[1,25] In the setting of SLE with or without

Mayo Clin Proc. ■ November 2020;95(11):2525-2534 ■ https://doi.org/10.1016/j.mayocp.2020.08.045
www.mayoclinicproceedings.org

immunosuppressive use and no evidence of APAS, all methods are category 1-2.[1,25] In SLE with severe thrombocytopenia, TCu380A IUD and DMPA are category 3 for initiation with all other methods being category 2.[1] TCu380A IUD used in severe thrombocytopenia may be associated with increased bleeding compared with LNG IUS.[1,25] Progestin-only contraceptives may be useful in women with severe thrombocytopenia. However, DMPA can cause erratic or increased bleeding on initiation and can be irreversible for 11 to 13 weeks.[1] Initiation should be considered carefully.[1]

Human Immunodeficiency Virus and Acquired Immunodeficiency Syndrome

At the end of 2016, it was estimated that 1.1 million people aged 13 or older have HIV in the United States including an estimated 162,500 (14%) whose infections had not yet been diagnosed.[15] USMEC guidelines were updated for contraception in HIV patients with IUS and DMPA listed as category 1 along with implant, POP, and CHC clarifying that all methods are safe.[26] There is no evidence of greater viral shedding or risk of transmission to an uninfected partner.[27] Limited data show no increased risk of IUC use and pelvic inflammatory disease (PID), but given the risk of concurrent sexually transmitted infections (STIs) in HIV, the USSPR recommends screening for STIs according to CDC guidelines.[2] All methods may be used with antiretrovirals and are listed as category 1-2; CHC is category 3 with use of fosamprenavir.[1]

Sexually Transmitted Diseases/Infections/ Pelvic Inflammatory Disease

The CDC reported in its Sexually Transmitted Disease Surveillance Report in 2019 that sexually transmitted diseases for the fifth consecutive year had increased with 2.5 million combined cases of chlamydia, gonorrhea, and syphilis in 2018.[28] While sexually transmitted diseases are increasing, PID is declining potentially related to earlier identification and treatment of chlamydia and gonorrhea with availability of single-dose therapies to enhance adherence to treatment.[15,28] Intrauterine contraceptives are category 4 for initiation when there is any current suspicion for PID, presence of purulent cervicitis, or known chlamydial or gonococcal infection.[1] If PID develops with IUC in place, it can usually be treated without device removal.[2,12] If a woman is not improved after 48 to 72 hours on antibiotics, consideration can be given to IUC removal.[2] Intrauterine contraceptives are category 2 for evidence of vaginitis with trichomonas and bacterial vaginosis.[1] The CDC's recommended screening for STIs should be up-to-date before insertion of IUC based on age and risk factors.[2] Delay in insertion is not necessary unless PID is suspected.[1] Implant, DMPA, POP, and CHC are category 1 with STIs, vaginitis, and in women at increased risk of STIs.[1,2] There is no indication for antibiotic prophylaxis for IUC insertion.[12]

Solid Organ Transplant(s)/ Immunosuppression

In the United States, the most commonly transplanted organs are kidneys, liver, heart, lungs, pancreas, and intestines.[15] There are approximately 75,000 people on the active transplant list.[15] At least 3% to 4% of the US population is immunosuppressed because of transplantation.[15] For women with solid organ transplant(s), limited studies do not report higher infection rates for immunosuppressed IUC users.[29,30] Hormonal and non-hormonal IUCs may be initiated and continued in uncomplicated solid organ transplantation as category 2 whereas IUC initiation is category 3 in complicated solid organ transplantation.[1,30] If the IUS is already in place in complicated solid organ transplantation, it may remain in place (category 2).[1,30] Implant, DMPA, and POP are category 2.[1] Combined hormonal contraceptives are category 4 for complicated organ transplant but may be used in uncomplicated organ transplant (category 2).[1]

Obesity

Obesity rate (BMI>30 kg/m^2) in the general population is 42.4% with obesity-related conditions including cardiac disease, CVA, type 2 diabetes, and certain cancers.[15] Of the 160 million Americans who are considered overweight (BMI>25 kg/m^2) or obese, 60% are women.[15] Based on a 2016 Cochrane review, obese women can be offered all hormonal contraception as the efficacy of hormonal contraception is not significantly affected.[31] More research is needed to better understand how obesity affects contraceptive efficacy, especially in women with BMI greater than 40 kg/m^2.[31] It may be possible that continuous COC or 30 to 35 μg estrogen-containing formulations may be more effective in obese women.[32] Evidence regarding efficacy of the patch and ring is limited, but both are more efficacious than barrier methods alone.[6] Concern for VTE risk with use of CHC is outweighed by VTE risk in pregnancy and postpartum.[25] Obese women have a greater risk of abnormal uterine bleeding and endometrial intraepithelial neoplasia (EIN)/hyperplasia.[25] Levonorgestrel 52 mg IUS or other progestin-containing contraception may provide endometrial stabilization and contraception (category 1).[33] If placement of IUC is challenging given high BMI and patient discomfort, sedation can be offered. TCu380A IUD and implant are category 1.[1] Depot medroxyprogesterone acetate is category 1 for women with BMI greater than 30 kg/m^2 and category 2 for those with BMI greater than 30 kg/m^2 and age younger than 18 years given risk for mild bone loss.[1] Depot medroxyprogesterone acetate may cause some women to gain up to 5% of their BMI within 6 months of initiation and further weight gain over the next 36 months, whereas other women do not gain weight on DMPA.[2] If weight gain is an issue, alternative contraception includes POP (category 1) and CHC (category 2).[1]

For women undergoing diverting bariatric procedures (Roux-en-Y gastric bypass or biliopancreatic diversion), the absorption of oral medications may be compromised and POP and CHC are category 3.[1,34] Progestin only pill and CHC are category 1 in women with restrictive bariatric surgery (vertical banded gastroplasty, laparoscopic adjustable gastric band, or laparoscopic sleeve gastrectomy).[1,34]

Migraines

Migraine headaches affect 17.1 of US women most commonly between ages 18 to 44 years.[35] It is important to determine the presence of an aura or focal neurological symptoms before migraine pain. Migraine without aura is most common, accounting for 75% of cases.[25,35] Aura involves neurologic symptoms, usually visual, occurring generally before headache and lasting 5 to 60 minutes.[36] Symptoms include zigzag lines across the visual field, sensory symptoms as pins and needles, speech disturbances, or motor weakness.[36] All methods of contraception are category 1 in non-migraine (mild or severe) headaches.[1] Intrauterine contraceptives, implant, DMPA, and POP are category 1 in women with migraines, with and without aura.[37] Combined hormonal contraceptives are category 2 in migraine without aura and no other risk factors for CVA.[1,37] If migraines without aura are worsened during the inert week of CHC, continuous CHC may be helpful.[38] Combined hormonal contraceptives are category 4 for women with migraines and aura due to increased CVA risk.[1,37] The data regarding CVA with current COC formulations in migraines and aura is limited, but earlier formulations have been associated with a two- to four-fold increased CVA risk.[37]

Seizures and Anticonvulsants

Approximately 3.4 million people in the United States have epilepsy.[15] Whereas anticonvulsant therapies challenge contraceptive choice, effective contraception is important because seizure activity may worsen in pregnancy and adversely affect maternal and fetal outcomes.[25] Intrauterine contraceptives are category 1 for women taking antiepileptic drugs (AEDs).[39] Depotmedroxyprogesterone acetate (category 1) 150 mg every 3 months

Mayo Clin Proc. ■ November 2020;95(11):2525-2534 ■ https://doi.org/10.1016/j.mayocp.2020.08.045
www.mayoclinicproceedings.org

represents a dose substantially higher than needed to suppress ovulation and confers a benefit in raising the seizure threshold.[40] Several AEDs induce hepatic enzymes, decreasing serum levels of CHC or POP (category 3) and increasing risk for unintended pregnancy (eg, carbamazepine, barbiturates, phenobarbital, phenytoin, primidone, topiramate, or oxcarbazepine).[1,41] Combined hormonal contraceptives' efficacy may be improved with 30 to 35 μg ethinyl estradiol formulations.[40] It is unclear if the contraceptive ring and patch are similar in efficacy to CHC though the transvaginal and transdermal routes offer the advantage of less need for daily attention.[41] Most anticonvulsants decrease the effectiveness of the implant (category 2) with some pregnancies reported, but the absolute risk of contraceptive failure remains low.[42] Lamotrigine is the only AED known to have its metabolism affected by COC, reducing lamotrigine serum levels.[40] Lamotrigine dosage needs to be adjusted with concurrent CHC use.[40] The POP is category 1 with lamotrigine.[25,40] When lamotrigine is used for bipolar disease and other mental health disorders in conjunction with CHC, higher doses of lamotrigine may be needed.[43]

Post Abortion

Intrauterine contraceptives, implant, DMPA, POP, and CHC are category 1-2 and may be immediately used after spontaneous or induced abortion (medical or surgical).[12] Offering contraception or LARC on the same day of first- or second-trimester induced or spontaneous abortion is safe.[12] Risk for complications after immediate or delayed IUC insertion following abortion does not differ.[12] Intrauterine contraceptives expulsion is greater after a second trimester than first trimester abortion.[1,12] Intrauterine contraceptives insertion immediately post-septic abortion is contraindicated (category 4).[1]

Thyroid Disease

Approximately 20 million Americans have some form of thyroid disease with women more often affected.[15] Intrauterine contraceptives, implant, DMPA, POP, and CHC are category 1 with simple goiter, hyperthyroidism, or hypothyroidism.[1]

Multiple Sclerosis

Nearly 1 million Americans are living with multiple sclerosis with the prevalence related to latitude (47 per 100,000 population in Texas are affected and 109.5 per 100,000 in Ohio, per the CDC).[15] Most people receive the diagnosis between 20 and 50 years of age with far more women than men diagnosed.[15] Intrauterine contraceptives, implant, POP, and CHC are category 1 when mobility is not an issue.[1] Depotmedroxyprogesterone acetate is category 2 with and without prolonged immobility whereas CHC is category 3 with prolonged immobility.[1]

Cervical Cancer

Cervical cancer occurs in greater than 13,500 women yearly in the United States.[15] Cervical cancer is most frequently diagnosed in women between ages 35 and 44 years.[15] Intrauterine contraceptives are category 4 with known cervical cancer.[1] Implant, DMPA, POP, and CHC can be used while women are awaiting treatment (category 1-2).[1,25] All methods can be used with cervical ectropion, cervical intraepithelial neoplasia, or dysplasia.[1] Depot medroxyprogesterone acetate or CHC use for 5 years or longer may increase the risk for carcinoma in situ and invasive cervical cancer in the setting of persistent human papillomavirus.[44] Limited evidence suggests that the implant does not increase risk.[1] Invasive cervical cancer may be reduced by 30% in women who have used IUCs.[45]

Endometrial Cancer/Endometrial Hyperplasia or Endometrial Intraepithelial Neoplasia

Endometrial cancer is on the rise in the United States with lifetime risk 3.1%.[15] Black women are disproportionately affected compared with White women.[15] The increase in endometrial cancer reflects the prevalence of overweight and obese women

along with other risk factors such as hypertension and diabetes.[15] Intrauterine contraceptives are category 4 in known endometrial cancer but endometrial hyperplasia/EIN may regress or remain stable while using 52 mg LNG IUS.[33] Implant, DMPA, POP, and CHC are category 1.[1] Contraception (including COC and 52 mg LNG IUS) plays a dual role in minimizing the risk of endometrial cancer.[33,46]

Gestational Trophoblastic Disease

Gestational trophoblastic disease (GTD) occurs in approximately 1 per 1000 pregnancies.[25] Intrauterine contraceptives are category 1-2 in GTD but category 4 with persistently elevated beta—human chorionic gonadotropin (hCG) levels or malignant disease with suspicion of intrauterine involvement. Implant, DMPA, POP, and CHC are category 1 in GTD when beta-hCG levels are decreasing or undetectable and may be used with persistently elevated beta-hCG levels or malignant disease (category 1).[1,25]

Ovarian Cancer

The incidence of ovarian cancer in the United States results in 14,000 deaths annually.[15] Ovarian cancer continues to be diagnosed at an advanced stage in most women. Intrauterine contraceptives, implant, DMPA, POP, and CHC are category 1 in ovarian cancer. Data show that COC lessens the risk of ovarian cancer as does use of IUC in a new meta-analysis.[46,47]

Breast Cancer

Breast cancer is the most common cancer in women.[15] Lifetime risk of breast cancer is approximately 12.9%.[15] TCu380A IUD is category 1 in breast cancer. Levonorgestrel IUS, implant, DMPA, POP, and CHC are category 4 given that most breast cancers are hormonally active due to concern for worsened prognosis.[1] In benign breast disease or with a family history of breast cancer, all methods are category 1.[1,25] Care for BRCA 1 and 2 carriers is more complex given their risk for breast and ovarian cancer. A systematic review recommended that BRCA carriers be informed that COC may reduce risk of ovarian cancer but potentially increase risk for breast cancer.[48]

SUMMARY

Women's coexisting medical conditions often challenge contraceptive decisions as recommendations evolve. Long-acting reversible contraception should be the first line of options for most women throughout the reproductive lifespan given their efficacy, convenience, and safety. However, other methods should also be considered as they may confer a lower risk than unplanned pregnancy. Resources such as the USMEC, USSPR, and the USMEC app facilitate the contraceptive choice process by providing expert and evidence-based support for individualized assessment and shared decision-making.

CONCLUSION

It is important to individualize contraception through shared decision-making in women with chronic medical conditions.

Abbreviations and Acronyms: **BMI** = body mass index; **CDC** = Centers for Disease Control and Prevention; **CHC** = combined hormonal contraceptives; **COC** = combined oral contraceptives; **CVA** = cerebral vascular event; **DMPA** = depot medroxyprogesterone acetate; **EIN** = endometrial intraepithelial neoplasia; **IUC** = intrauterine contraception; **IUD** = intrauterine device; **IUS** = intrauterine contraceptive system; **LARC** = long-acting reversible contraception; **LNG** = levonorgestrel; **MI** = myocardial infarction; **POP** = progestin only pill; **STI** = sexually transmitted infection; **USMEC** = United States Medical Eligibility Criteria for Contraceptive Use; **USSPR** = US Selected Practice Recommendations for Contraceptive Use; **VTE** = venous thromboembolism

Potential Competing Interests: The authors report no potential competing interests.

Correspondence: Address to Mary L. Marnach, MD, Mayo Clinic, 200 First St SW, Rochester, MN 55905 (marnach.mary@mayo.edu).

ORCID

Mary L. Marnach: https://orcid.org/0000-0002-6255-7272

REFERENCES

1. Curtis KM, Tepper NK, Jatlaoui TC, et al. US medical eligibility criteria for contraceptive use. *MMWR Recomm Rep*. 2016; 65(3):1-103.

2. Curtis KM, Jatlaoui TC, Tepper NK, et al. US selected practice recommendations for contraceptive use, 2016. *MMWR Recomm Rep*. 2016;65(4):1-66.
3. Gavin L, Pazol K, Ahrens K. Update: providing quality family planning services — recommendations from CDC and the US Office of Population Affairs, 2017. *MMWR Morb Mortal Wkly Rep*. 2017;66(50):1383-1385.
4. Zapata LB, Morgan IA, Curtis KM, Folger SG, Whiteman MK. Changes in US health care provider attitudes related to contraceptive safety before and after the release of national guidance. *Contraception*. 2019;100(5):413-419.
5. Ti A, Curtis KM. Postpartum hormonal contraception use and incidence of postpartum depression: a systematic review. *Eur J Contracept Reprod Health Care*. 2019;24(2):109-116.
6. Dragoman MV, Simmons KB, Paulen ME, Curtis KM. Combined hormonal contraceptive (CHC) use among obese women and contraceptive effectiveness: a systemic review. *Contraception*. 2017;95(2):117-129.
7. Maroo A, Chahine J. Contraception strategies in women with heart failure or with cardiac transplantation. *Curr H Failure Rep*. 2018;15(3):161-170.
8. Dragoman MV, Tupper NK, Fu R, Curtis KM, Chow R, Gaffield ME. A systemic review and meta-analysis of venous thrombosis risk among users of combined oral contraception. *Int J Gynaecol Obstet*. 2018;141(3):287-294.
9. Ermias Y, Morgan IA, Curtis KM, Whiteman MK, Horton LG, Zapata LB. Factors associated with provision of depo medroxyprogesterone acetate to adolescents by US health care providers. *Contraception*. 2019;99(5):300-305.
10. Ti A, Stone RH, Whiteman M, Curtis KM. Safety and effectiveness of hormonal contraception for women who use opioids: a systematic review. *Contraception*. 2019;100(6):480-483.
11. Simmons KB, Haddad LB, Nanda K, Curtis KM. Drug interactions between non-rifamycina antibiotics and hormone contraception: a systemic review. *Am J Obstet Gynecol*. 2018;218(1):88-97.e14.
12. Committee on Practice Bulletin-Gynecology. Long-Acting Reversible Contraception Work Group. Practice Bulletin No. 186: Long-acting reversible contraception: implants and intrauterine devices. *Obstet Gynecol*. 2017;130(5):e251-e269.
13. Oduyebo T, Zapata LB, Boutot ME, et al. Factors associated with postpartum use of long-acting reversible contraception. *Am J Obstet Gynecol*. 2019;221(1):43e1-4343.e11.
14. Daniels K, Abma J. NCHS Data Brief, No. 327, Dec 2018. https://www.cdc.gov/nchs/products/databriefs.htm. Accessed May 29, 2020.
15. National Center for Health Statistics and Prevalence of Disease, Data and Statistics. https://www.cdc.gov. Accessed May , 2020.
16. Grigoryan OR, Grodnitskaya EE, Andreeva EN, Shestakova MV, Melnichenko GA, Dedov II. Contraception in perimenopausal women with diabetes mellitus. *Gynecol Endocrinol*. 2006;22(4):198-206.
17. Kemmeren JM, Tanis BC, van den Bosch MA, et al. Risk of arterial thrombosis in relation to oral contraceptives (RATIO) study: oral contraceptives and risk of ischemic stroke. *Stroke*. 2002;33(5):1202-1208.
18. Khader YS, Rice J, John L, Abueita O. Oral contraceptives use and the risk of myocardial infarction: a meta-analysis. *Contraception*. 2002;68(1):11-17.
19. Bergendal A, Persson I, Odeberg J, et al. Association of venous thromboembolism with hormonal contraception and thrombophilic genotypes. *Obstet Gynecol*. 2014;124(3):600-609.
20. Chi C, Huq FY, Kadir RA. Levonorgestrel-releasing intrauterine system for the management of heavy menstrual bleeding in women with inherited bleeding disorders: long-term follow-up. *Contraception*. 2011;83(3):242-247.
21. Martinelli I, Lensing AW, Middeldorp S, Levi M, Beyer-Westendorf J, van Bellen B. Recurrent venous thromboembolism and abnormal uterine bleeding with anticoagulant and hormone therapy use. *Blood*. 2016;127(11):1417-1425.
22. Legardy JK, Curtis KM. Progestin-only contraceptive use among women with sickle anemia: a systematic review. *Contraception*. 2006;73(2):195-204.
23. Ortizo R, Lee SY, Nguyen ET, Jamal MM, Bechtold MM, Nguyen DL. Exposure to oral contraceptives increases the risk for development of inflammatory bowel disease: a meta-analysis of case-controlled and cohort studies. *Eur J Gastroenterol Hepatol*. 2017;29(9):1064-1070.
24. National Institutes of Health. Autoimmune Diseases of Rheumatoid Arthritis and Lupus. https://www.nih.gov/research-training/accelerating-medicines-partnership-amp/autoimmune-diseases-rheumatoid-arthritis-lupus. Accessed October 21, 2020.
25. American College of Obstetricians and Gynecologists' Committee on Practice Bulletins. ACOG Practice Bulletin No. 206: use of hormonal contraception in women with coexisting medical conditions. *Obstet Gynecol*. 2019;133(2):e128-150.
26. Tepper NK, Curtis KM, Cox S, Whiteman MK. Update to US medical eligibility criteria for contraceptive US, 2016: updated recommendations for the use of contraception among women at high risk for HIV infection. *MMWR Morb Mortal Wkly Rep*. 2020;69(14):405-410.
27. Heikinheimo O, Lehtovirta P, Aho I, Ristola M, Paavonen J. The levonorgestrel-releasing intrauterine system in human immunodeficiency virus-infected women: a 5-year follow-up study. *Am J Obstet Gynecol*. 2011;204(2):126.e1-126.e4.
28. 2018 STD Surveillance Report. www.cdc.gov. Accessed May , 2020.
29. Browne H, Manipalviratn S, Armstrong A. Using an intrauterine device in immunocompromised women. *Obstet Gynecol*. 2008;112(3):667-669.
30. Huguelet PS, Sheehan C, Spitzer RF, Scott S. Use of levonorgestrel 52-mg intrauterine system in adolescent and young adult solid organ transplant recipients: a case series. *Contraception*. 2017;95(4):378-381.
31. Lopez LM, Bernholc A, Chen M, et al. Hormonal contraceptives for contraception in overweight or obese women. *Cochrane Database Syst Rev*. 2016;8:CD008452.
32. Edelman AB, Cherala G, Munar MY, McInnis M, Stanczyk FZ, Jensen JT. Correcting oral contraceptive pharmacokinetic alterations due to obesity: a randomized controlled trial. *Contraception*. 2014;90(5):550-556. 2014.
33. Morelli M, Di Cello A, Venturella R, Mocciaro R, D'Alessandro P, Zullo F. Efficacy of the levonorgestrel intrauterine system (LNG IUS) in the prevention of atypical endometrial hyperplasia and endometrial cancer: retrospective data from selected obese menopausal symptomatic women. *Gynecol Endocrinol*. 2013;29(2):156-159. 2013.
34. American College of Obstetricians and Gynecologists. ACOG Practice Bulletin No. 105: Bariatric surgery and pregnancy. *Obstet Gynecol*. 2009;113(6):1405-1413.
35. Lipton RB, Bigal ME, Diamond M, Freitag F, Reed ML, Stewart WF. AMPP advisory Group. Migraine prevalence, disease burden, and the need for preventive therapy. *Neurology*. 2007;68(5):343-349.
36. Headache Classification Committee of the International Headache Society (HIS) the International Classification of Headache Disorders, 3rd edition. *Cephalalgia*. 2018;38(1):1-211.
37. Tepper NK, Whiteman MK, Zapata LB, Marchbanks PA, Curtis KM. Safety of hormonal contraceptives among women with migraine: a systemic review. *Contraception*. 2016;94(6):630-640. 2016.
38. Faubion SS, Casey PM, Shuster LT. Hormonal contraception and migraine: clinical considerations. *Perimenstrual Headache*. 2012;16:461-466.
39. Bounds W, Guillebaud J. Observational series on women using the contraceptive Mirena concurrently with antiepileptic and other enzyme-inducing drugs. *J Fam Plann Reprod Health Care*. 2002;28(2):78-80.
40. Davis AR, Pack AM, Dennis A. Contraception for Women With Epilepsy. In: Allen RH, Cwiak CA, eds. *Contraception for*

the medically challenging patient. New York, NY: Springer; 2014: 135-136.

41. Gaffield ME, Culwell KR, Lee CR. The use of hormonal contraception among women taking anticonvulsant therapy. *Contraception*. 2011;83(1):16-29.
42. Maddox DD, Rahman Z. Etonogestrel (Implanon), another treatment option for contraception. *P T*. 2008;33(6):337-347.
43. Prabhavalkar KS, Poovanpallil NB, Bhatt LK. Management of bipolar depression with lamotrigine: an antiepileptic mood stabilizer. *Front Pharmacol*. 2015;242(6):1-11.
44. Smith JS, Green J, Berrington de Gonzalez A. Cervical cancer and use of hormonal contraceptives: a systematic review. *Lancet*. 2003;361(9364):1159-1167.
45. Cortessis VK, Barrett M, Brown Wade N, et al. Intrauterine device use and cervical cancer risk: a systematic review and meta-analysis. *Obstet Gynecol*. 2017;130(6):1226-1236.
46. Wentzensen N, Berringtonde Gonzalez A. The Pill's gestation: from birth control to cancer prevention. *Lancet Oncol*. 2015; 16(9):1004-1006.
47. Wheeler LJ, Desanto K, Teal SB, Sheeder J, Guntupalli SR. Intrauterine device use and ovarian cancer risk: a systematic review and meta-analysis. *Obstet Gynecol*. 2019;134(4):791-800.
48. Huber D, Seitz S, Kast K, Emons G, Ortmann O. Use of oral contraceptives in BRCA mutation carriers and risk for ovarian cancer: a systematic review. *Arch Gynecol Obstet*. 2020;301(4): 875-884.