VA/DOD CLINICAL PRACTICE GUIDELINE FOR THE MANAGEMENT OF PREGNANCY

Department of Veterans Affairs
Department of Defense

Clinician Summary

QUALIFYING STATEMENTS

The Department of Veterans Affairs and the Department of Defense guidelines are based upon the best information available at the time of publication. They are designed to provide information and assist decision making. They are not intended to define a standard of care and should not be construed as one. Neither should they be interpreted as prescribing an exclusive course of management.

This Clinical Practice Guideline is based on a systematic review of both clinical and epidemiological evidence. Developed by a panel of multidisciplinary experts, it provides a clear explanation of the logical relationships between various care options and health outcomes while rating both the quality of the evidence and the strength of the recommendation.

Variations in practice will inevitably and appropriately occur when clinicians take into account the needs of individual patients, available resources, and limitations unique to an institution or type of practice. Every healthcare professional making use of these guidelines is responsible for evaluating the appropriateness of applying them in the setting of any particular clinical situation.

These guidelines are not intended to represent Department of Veterans Affairs or TRICARE policy. Further, inclusion of recommendations for specific testing and/or therapeutic interventions within these guidelines does not guarantee coverage of civilian sector care. Additional information on current TRICARE benefits may be found at www.tricare.mil or by contacting your regional TRICARE Managed Care Support Contractor.

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I. Introduction

The Department of Veterans Affairs (VA) and the Department of Defense (DoD) Evidence-Based Practice Work Group (EBPWG) was established and first chartered in 2004, with a mission to advise the "…Health Executive Council on the use of clinical and epidemiological evidence to improve the health of the population across the Veterans Health Administration and Military Health System," by facilitating the development of clinical practice guidelines (CPGs) for the VA and DoD populations.[1] This CPG is intended to provide healthcare providers with a framework by which to evaluate, treat, and manage the individual needs and preferences of pregnant women, thereby leading to improved clinical outcomes.

In 2009, the VA and DoD published a CPG for the Management of Pregnancy (2009 Pregnancy CPG), which was based on evidence reviewed through December 2007. Since the release of that guideline, a growing body of research has expanded the general knowledge and understanding of pregnancy and its management. Consequently, a recommendation to update the 2009 Pregnancy CPG was initiated in 2016. The updated CPG includes objective, evidence-based information on the management of pregnancy. It is intended to assist healthcare providers in all aspects of care for a pregnant woman. The system-wide goal of developing evidence-based guidelines is to improve patients' health and well-being by guiding health care providers who are taking care of pregnant women along the management pathways that are supported by evidence. The expected outcome of successful implementation of this guideline is to:

- Assess the condition of the mother and baby and determine the best management method in collaboration with the mother and, when possible and desired, other family and caregivers
- Optimize the mother and baby's health outcomes and improve quality of life
- Minimize preventable complications and morbidity
- Emphasize the use of patient-centered care (PCC)

II. Recommendations

The following recommendations were made using a systematic approach considering four domains as per the Grading of Recommendations Assessment, Development and Evaluation (GRADE) approach as detailed in the section on Methods and Appendix A in the full text Pregnancy CPG. These domains include: confidence in the quality of the evidence, balance of desirable and undesirable outcomes (i.e., benefits and harms), patient or provider values and preferences, and other implications, as appropriate (e.g., resource use, equity, acceptability).

		#	Recommendation	Strength*	Category†
Care Throughout Pregnancy	*a. Routine Care During Pregnancy*	1.	We suggest offering a group model of prenatal care as an acceptable alternative to individual provider appointments.	Weak for	Not reviewed, Amended
		2.	We recommend that all healthy, pregnant women without known contraindications participate in regular mild to moderate exercise sessions, three or more times per week.	Strong for	Reviewed, Amended
		3.	We suggest that women with uncomplicated pregnancies continue a standard work schedule throughout their pregnancy.	Weak for	Not reviewed, Amended
	b. Nutrition	4.	We recommend folic acid (at least 400 micrograms daily) to be taken starting one month before conception and continued throughout pregnancy and breastfeeding.	Strong for	Not reviewed, Amended
	c. Screening	5.	We recommend screening for use of tobacco, alcohol, illicit drugs, and unauthorized use of prescription medication because their use is common and can result in adverse outcomes. For women who screen positive, we recommend additional evaluation and treatment (see VA/DoD Clinical Practice Guidelines for the Management of Substance Use Disorders[1] and the Management of Tobacco Use[2]).	Strong for	Reviewed, Amended
		6.	We recommend screening for depression using a standardized tool such as the Edinburgh Postnatal Depression Scale or the 9-item Patient Health Questionnaire periodically during pregnancy and postpartum.	Strong for	Reviewed, New-replaced
	d. Education	7.	We recommend breastfeeding education, assessment, and support to all pregnant women and their families at the first visit and throughout the pregnancy and postpartum period using open-ended questions such as "What do you know about breastfeeding?"	Strong for	Reviewed, New-replaced

[1] See the VA/DoD Clinical Practice Guideline for the Management of Substance Use Disorders. Available at: https://www.healthquality.va.gov/guidelines/mh/sud/

[2] See the Clinical Practice Guideline for the Management of Tobacco Use. Available at: https://www.healthquality.va.gov/CPGArchives.asp

		#	Recommendation	Strength*	Category†
One-time Interventions	*a. Screening and Diagnostic Testing*	8.	We suggest making prenatal diagnostic testing for aneuploidy available to all pregnant women.	Weak for	Reviewed, New-replaced
		9.	We recommend offering prenatal screening for aneuploidy and the most common clinically significant genetic disorders to all pregnant women. When aneuploidy screening is desired, cell-free fetal DNA screening should be considered; however, screening test selection should be individualized and take into account the patient's age, baseline aneuploidy risk, and test performance for a given condition.	Strong for	Reviewed, New-replaced
		10.	We suggest the two-step process (one-hour oral glucose challenge test followed by three-hour oral glucose tolerance test) to screen for gestational diabetes mellitus at 24-28 weeks gestation for all pregnant women.	Weak for	Reviewed, New-replaced
One-time Interventions (cont.)	*b. Imaging*	11.	We recommend first-trimester ultrasound to establish or confirm the gestational age and estimated birth date, identify multiple pregnancies, and confirm the presence of cardiac activity. ▪ For pregnant women who present after the first trimester, we suggest performing a dating and anatomical ultrasound at the earliest opportunity, preferably prior to 22 weeks.	Strong for	Reviewed, New-replaced
	c. Preparing for Delivery	12.	We recommend offering scheduled delivery to women who reach 41 weeks and 0/7 days undelivered. Antepartum fetal testing should begin at 41 weeks and 0/7 days if not scheduled for delivery.	Strong for	Reviewed, Amended
	d. Postpartum Care	13.	For pregnant women who have a past or current history of gestational diabetes mellitus, hypertension, or preeclampsia, we recommend documenting the reproductive history and making women aware of the increased lifetime risks of cardiovascular disease and/or diabetes.	Strong for	Reviewed, New-added
Referral		14.	We suggest that pregnant women with an unexplained elevation of maternal serum alpha-fetoprotein be evaluated and counseled by a qualified obstetric provider due to increased risk for adverse perinatal outcomes.	Weak for	Not reviewed, Amended
		15.	We recommend against routine screening for preterm delivery using the fetal fibronectin test in asymptomatic women.	Strong against	Not reviewed, Amended
		16.	We recommend considering the use of fetal fibronectin testing as a part of the evaluation strategy in women between 24 and 34 6/7 weeks gestation with signs and symptoms of preterm labor, particularly in facilities where the result might affect management of delivery.	Strong for	Not reviewed, Amended

		#	Recommendation	Strength*	Category†
Subpopulations	*a. High Risk for Preeclampsia*	17.	In women at risk of preeclampsia, we recommend low dose (e.g., 100-150 mg daily) aspirin therapy initiated at or before 16 weeks gestation.	Strong for	Reviewed, New-added
	b. High Risk for Preterm Delivery	18.	We recommend antenatal progesterone therapy in consultation with an advanced prenatal care provider (e.g., obstetrician or maternal-fetal medicine) for women at high risk for recurrent preterm delivery and who meet the generally accepted inclusion criteria.	Strong for	Not reviewed, Amended
	c. Over 44 Years of Age	19.	We suggest offering women greater than 44 years of age planned delivery at 38 weeks gestational age to reduce the risk of stillbirth.	Weak for	Reviewed, New-added
	d. History of Bariatric Surgery	20.	We suggest that women who have undergone bariatric surgery should be evaluated for nutritional deficiencies and need for nutritional supplementation where indicated (e.g., vitamin B12, folate, iron, calcium).	Weak for	Reviewed, New-replaced
		21.	For pregnant women who have undergone bariatric surgery, there is insufficient evidence to recommend for or against the routine supplementation of vitamins A, D, E, or K.	N/A	Reviewed, New-replaced
		22.	We suggest that pregnant women with a history of gastric bypass surgery be evaluated by a surgeon with bariatric expertise.	Weak for	Reviewed, Amended

*For additional information, please refer to the Methods section below, as well as section on Grading Recommendations in the full text Pregnancy CPG.

†For additional information, please refer to the Methods section below, as well as the section on Recommendation Categorization and Appendix A in the full text Pregnancy CPG.

III. Algorithm

This algorithm is designed to inform providers of the recommended interventions and appropriate timing of each of the interventions for women during pregnancy and in the postpartum period. The interventions included in the algorithm are paired with the corresponding recommendation in the VA/DoD Clinical Practice Guideline for the Management of Pregnancy. Following the algorithm, narrative sections, Standard of Pregnancy Care and Routine Pregnancy Care, provide additional information.

A. Algorithm Key

Symbol	Meaning
P	Action to be carried out by provider
R	Referral needs to be made to an advanced prenatal care provider (e.g., obstetrician or maternal-fetal medicine)
L	Lab needs to be ordered
Dotted	Timing is not ideal, but it is still helpful for the pregnant woman to receive this action at this time (rather than not at all)
V1	First visit
PP	Postpartum visit

B. Actions at Every Visit

At every visit, assess:

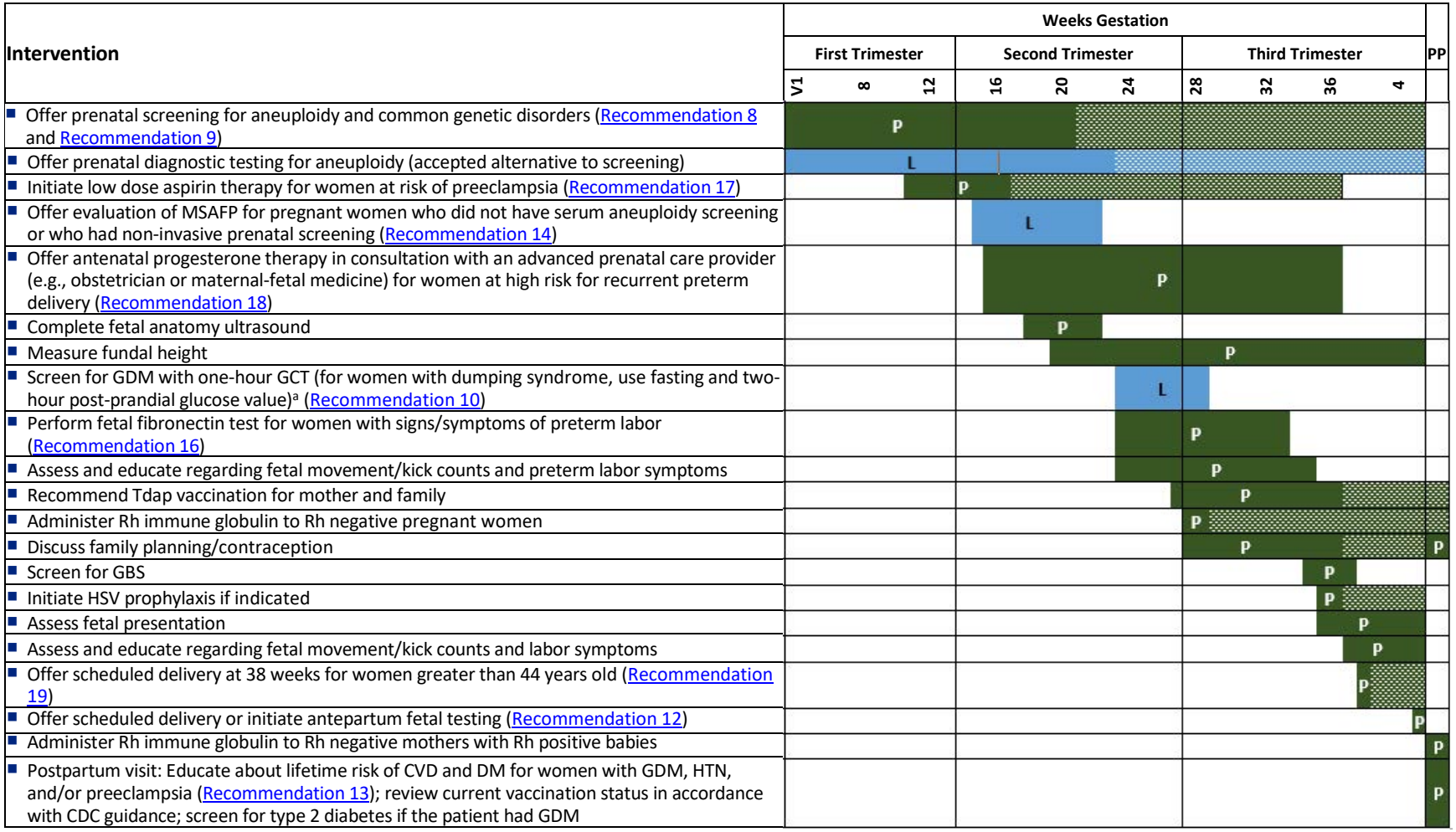
- Blood pressure
- Body mass index (BMI)
- Weight gain
- Medication reconciliation
- Need for consultation with advanced prenatal care provider (e.g., obstetrician or maternal-fetal medicine) for women at high risk for preterm delivery (Recommendation 18)

Note:

Please see the below sections Standard of Pregnancy Care and Routine Pregnancy Care.

C. Interventions by Weeks Gestation

Intervention	Weeks Gestation: First Trimester V1	8	12	Second Trimester 16	20	24	Third Trimester 28	32	36	40	PP
■ Screen for intimate partner violence[a] ■ Screen for depression using standardized tool (e.g., EPDS, PHQ-9)[a] (Recommendation 6)	P						P				P
■ Screen for tobacco, alcohol, illicit drugs, and non-prescribed use of medication; if positive, recommend cessation and offer assistance[a] (Recommendation 5) ■ Provide prenatal education (e.g., dental health, breastfeeding [Recommendation 7], exercise [Recommendation 2], weight gain, work schedules [Recommendation 3], dietary supplementation [Recommendation 4])[b] ■ Recommend influenza vaccination (seasonal) for mother and family[b]	P										
■ Screen for infectious diseases (GC/CT, HIV, syphilis, rubella, hepatitis B, varicella [if unsure], asymptomatic bacteriuria, TB, history of HSV); treat or manage as indicated[a] ■ Screen for Rh status and anemia/hemoglobinopathies	L										
■ Evaluate for nutritional deficiencies in women who have undergone bariatric surgery with intervention as needed (Recommendation 20) ■ Consult with RDN for women who have undergone bariatric surgery and who are on a restrictive diet ■ Refer to bariatric surgeon women who have recently undergone gastric bypass surgery (Recommendation 22)	R										
■ Perform dating ultrasound[c] (Recommendation 11)	P										
■ Offer group model of prenatal care (Recommendation 1)	P										



[a] Follow-up for positive screen or based on patient need

[b] Provide education at the initial visit and throughout the pregnancy as needed

[c] This is optimally performed in the first trimester; in the absence of a first trimester ultrasound, dating can be established by ultrasound alone up to 22 6/7 weeks

Abbreviations: CDC: Centers for Disease Control and Prevention; CVD: cardiovascular disease; DM: diabetes mellitus; EPDS: Edinburgh Postnatal Depression Scale; GBS: group B streptococcus; GC/CT: Neisseria gonorrhoeae/Chlamydia trachomatis; GCT: glucose challenge test; GDM: gestational diabetes mellitus; HIV: human immunodeficiency virus; HPV: human papillomavirus; HSV: herpes simplex virus; HTN: hypertension; MSAFP: maternal serum alpha-fetoprotein; PHQ-9: Patient Health Questionnaire-9; RDN: Registered Dietician Nutritionist; Rh: rhesus; TB: tuberculosis; Tdap: tetanus-diphtheria-acellular pertussis

D. Standard of Pregnancy Care

Please note that some aspects of pregnancy care, although clinically important and part of the standard of pregnancy care, do not have sufficient high-quality evidence to support a stand-alone recommendation. In many cases, clinical studies assessing the efficacy of these standards of pregnancy care do not exist because they are determined to be routine actions and it would be unethical to withhold them from pregnancy women in order to conduct a clinical trial (e.g., administration of rhesus [Rh] immune globulin). This is true for actions that are to be completed at every visit (Actions at Every Visit), certain screenings, and other time-sensitive care.

a. Additional Information on Actions at Every Visit

Vital Signs

Vital signs, such as measuring blood pressure, calculating BMI, and weighing a pregnant woman at each prenatal visit, is the standard of care in VA, DoD, and in the community. High blood pressure in pregnancy may lead to life-threatening maternal and fetal outcomes. Routinely measuring blood pressure is useful in detecting and managing gestational hypertension, preeclampsia, and pre-existing hypertension in pregnant women. The United States Preventive Services Task Force (USPSTF) determined that the best strategy for preventing preeclampsia in pregnancy is early detection through routine blood pressure screening.[2] A pregnant woman's blood pressure should be measured at every visit.

Assessing weight and calculating BMI for pregnant women at every visit gives the provider an opportunity to offer interventions that can improve both obstetrical and neonatal outcomes. Women who are overweight or obese are at greater risk for adverse health conditions during the preconception, antepartum, and postpartum periods. Women with low BMI are also at risk for adverse maternal and neonatal outcomes. Inadequate weight gain is a risk factor for spontaneous abortion, preterm birth, fetal growth restriction, hypertensive disorders, and poor perinatal outcomes. Women with anorexia nervosa may be identified by a low initial BMI and/or inadequate antepartum weight gain.[3] This screening is particularly important in the military and Veteran population, as studies have suggested that this population may be at greater risk for BMI-associated obstetrical complications.[4] More information regarding recommended weight gain can be found in Table 1 and Table 2.

Table 1. Weight Gain Recommendations for Singletons [5]

Pre-pregnancy Weight (BMI in kg/m^2)	Recommended Weight Gain
Underweight (BMI <18.5)	28-40 lbs
Normal Weight (BMI 18.5-24.9)	25-35 lbs
Overweight (BMI 25.0-29.9)	15-25 lbs
Obese (BMI ≥30.0)	11- 20 lbs

Abbreviations: BMI: body mass index; kg: kilogram(s); lbs: pounds; m: meter(s)

Table 2. Weight Gain Recommendations for Women Pregnant With Twins [5]

Pre-pregnancy Weight (BMI in kg/m2)	Recommended Weight Gain
Underweight (BMI <18.5)	50-62 lbs
Normal Weight (BMI 18.5-24.9)	37-54 lbs
Overweight (BMI 25.0-29.9)	31-50 lbs
Obese (BMI ≥30.0)	25-42 lbs

Abbreviations: BMI: body mass index; kg: kilogram(s); lbs: pounds; m: meter(s)

Medication Reconciliation

Medication reconciliation or review at every prenatal visit to screen for potentially teratogenic medications, newly prescribed medications since the last prenatal visit, over the counter medications, and supplements is standard of care. When multiple providers are co-managing a pregnant woman, as in the case of VA and some DoD pregnant women, it is important to identify, address, and document medications. The Centers for Disease Control and Prevention (CDC) has partnered with other federal agencies and non-federal partners to improve the health of women and babies by working to identify the safest treatment options for the management of common conditions before and during pregnancy.[6] Pregnant women, in collaboration with their trusted providers and pharmacists, are highly motivated to protect developing babies from potential harms of medication use during pregnancy while maintaining optimal health.[6]

b. Screenings

Dental Care

Periodontal disease, although common during pregnancy, is both preventable and curable. While recommendations for treatment of periodontal disease cannot be endorsed specifically at this time for the purpose of decreasing adverse fetal and maternal pregnancy outcomes (e.g., preterm birth, low birth weight, pregnancy loss, preeclampsia, gestational diabetes mellitus [GDM]), several studies have shown there may be an association between periodontal disease and increased risk of adverse pregnancy outcomes.[7,8] Pregnancy is not a contraindication to most dental services, though some procedures requiring general anesthesia may be deferred to the postpartum period.[9] Oral health care is not only a component of a healthy pregnancy, but evidence suggests that most infants and young children acquire caries-causing bacteria from their mothers.[10] Routine dental care, including x-rays (with proper anatomic shielding) and periodontal therapy, along with good oral hygiene, should be encouraged throughout pregnancy.[10,11]

Immunizations

It is important that all pregnant and breastfeeding women are immunized according to current CDC schedules for vaccination. Maternal immunizations decrease the risk of life- or fetus-threatening diseases during pregnancy. Pregnant women are relatively immunocompromised and can be severely affected by influenza and other infectious pathogens. Immunizations help protect the mother from infection. They also enhance passive immunity of infants to pathogens that cause life-threatening illnesses. Safe immunization options during pregnancy are available, namely: pertussis, influenza, varicella, and rubella. Some patients may have concerns about the safety of vaccination in pregnancy; therefore, providers should be well-versed in the safety and benefits of vaccine administration.

- **Pertussis:** Also known as whooping cough, pertussis is a highly contagious bacterial disease that can cause coughing and difficulty breathing. Pertussis poses a significant burden on infants and can be very serious or deadly, especially in those younger than one year. Pregnant women should receive the Tdap (tetanus toxoid, reduced tetanus, diphtheria toxoid, and acellular pertussis) vaccine during each pregnancy to provide passive immunity to infants, who would not otherwise routinely receive it until two months of age.[12] Although a pregnant woman can receive the Tdap vaccine at any time during pregnancy, the optimal time to receive the vaccine is from 27-36 weeks gestation, maximizing maternal antibody response and passive antibody transfer to the newborn. Women who do not receive Tdap during pregnancy should receive the vaccine in the immediate postpartum period. Furthermore, all caregivers, family, or others who will have direct contact with the newborn should be immunized.[12]
- **Influenza:** Women who acquire influenza during pregnancy may experience increased morbidity and even death, with a possible increased spontaneous abortion rate.[13] For this reason, all women who are pregnant during influenza season should receive the influenza vaccine (an inactivated virus). According to the CDC, influenza vaccination is safe for both the mother and the fetus, regardless of gestational age. The influenza immunization has also been proven to be protective to both the mother and her baby from influenza for several months after birth.[14]
- **Varicella:** Women with varicella infection during pregnancy have a 10-20% risk of developing pneumonia, a significant risk factor for maternal mortality, which is estimated to be as high as 40%.[15] In pregnancy, varicella may cross the placenta resulting in congenital or neonatal varicella infection. Maternal infection in the first half of pregnancy has been associated with congenital varicella syndrome.[16] Neonatal varicella zoster virus (VZV) infection is associated with a high neonatal death rate.[17] Routine screening for varicella should be conducted through obtaining the mother's history. If there is a negative/uncertain history of prior disease or vaccination status, a varicella titer should be obtained. If the mother is non-immune, a vaccination should be offered during the postpartum period. The vaccine is contraindicated during pregnancy.[18,19]
- **Rubella:** Infection in the first 16 weeks of pregnancy can cause miscarriage or congenital rubella syndrome (CRS).[20] Due to concerns about possible teratogenicity, the measles/mumps/rubella (MMR) vaccination is not recommended during pregnancy.[21,22] Women who are not immune to rubella should be vaccinated before leaving the hospital after delivery.

Infectious Diseases

Screening for infectious diseases during pregnancy per current guidance from the CDC is recommended. Appropriate follow-up treatment and/or prophylaxis treatment depending upon the history, known exposure, and symptoms of infectious disease is necessary. This includes:

- Gonorrhea
- Chlamydia
- Syphilis
- Human immunodeficiency virus (HIV)

- Hepatitis B virus
- Rubella
- Human papillomavirus virus (HPV) (if there is a history of an abnormal cervical screen)
- Herpes simplex virus (HSV)
- Group B streptococcus (GBS)

Infectious diseases during pregnancy can cause significant mortality and morbidity in both the mother and the fetus. According to the CDC, screening for infectious diseases, counseling, and treatment can improve maternal and fetal outcomes.[23]

GBS infections are the leading cause of serious neonatal infections (e.g., sepsis, meningitis, pneumonia) within the first seven days of life (early-onset infection). Universal screening at 35-37 weeks gestation with a single vaginal swab and intrapartum antibiotic prophylaxis continues to be the standard.

Because new exposures and infectious agents can emerge (such as Zika virus), it is important to refer to the most recent CDC guidance. Screening can lead to diagnosis in asymptomatic women and allow pregnant women an opportunity to be treated.

Vitamins

We suggest daily multivitamins to be taken starting one month before conception and continued throughout pregnancy and breastfeeding. Women in the U.S. commonly supplement their diet with vitamins and minerals during pregnancy. Supplementation with individual vitamins and minerals such as folate, as well as with multivitamins, has been associated with improved outcomes. See Recommendation 4 for additional information on folate supplementation. Supplementation with multivitamins was found to lower the risk of preeclampsia and three forms of childhood cancer (pediatric brain tumors, neuroblastomas, and leukemia).[24,25] The Operation Supplement Safety website (www.opss.org) provides additional information that may be useful for patients regarding use of supplements during pregnancy and lactation, as well as information for women who may not be pregnant but who are planning to become pregnant or are of childbearing age.[26,27]

Nutrition

We suggest that pregnant women on restrictive diets (e.g., vegetarians, bariatric surgery) consult with a dietitian. Though there is no consensus on the necessary requirements for patients both pre- and post-bariatric surgery, it is a generally accepted standard of practice for surgeons and dietitians to follow up with these patients to monitor for surgical complications as well as nutritional adequacy and any potential deficiencies associated with the procedure. In addition to post-bariatric pregnant women, others with higher risk of nutritional complications include those who:

- Are vegetarian or vegan
- Avoid certain foods (e.g., due to food allergies, cultural reasons, fad diets)
- Are breastfeeding while pregnant
- Are underweight with a BMI <18.5 kg/m^2

- Are <17 years old
- Have a multiple gestation pregnancy
- Have a history of hypertension, hyperlipidemia, diabetes mellitus (DM), or GDM
- Have an eating disorder
- Are identified as food insecure (food insecurity is defined by the U.S. Department of Agriculture as a household-level economic and social condition of limited or uncertain access to adequate food [28])

The Academy of Nutrition and Dietetics (AND) recommends screening for the aforementioned nutritional risks and subsequent assessment by a Registered Dietitian Nutritionist (RDN) to evaluate the pregnant woman for nutritional adequacy during this phase of life.[29] Appointments with RDNs may not be feasible at all locations but tele-medical nutrition therapy may be a cost-effective option in some instances.

Intimate Partner Violence

Intimate partner violence (IPV) is a high-prevalence and high-risk problem that may be first identified during pregnancy, therefore routine screening during pregnancy is indicated. Risks of IPV during pregnancy include preterm birth, low birth weight, and decreased gestational age. In addition, a history of IPV is associated with higher rates of chronic pain, neurologic disorders, gastrointestinal disorders, and psychiatric disorders.[30] Although there is strong evidence for the utility of screening, there is no evidence regarding optimal screening times or intervals.

The 5-item Extended - Hurt, Insult, Threaten, Scream (E-HITS) tool has been found to be an effective screening method, with high levels of sensitivity and specificity.[30,31] The items are included below.

> In the past year, how often did a current or former intimate partner (e.g., boyfriend, girlfriend, wife, husband, sexual partner):
>
> 1. Physically hurt you
> 2. Insult or talk down to you
> 3. Threaten you with harm
> 4. Scream or curse at you
> 5. Force you to have sexual activities
>
> Responses for each item are on a 5-point scale: Never (1), Rarely (2), Sometimes (3), Often (4), Frequently (5). A score of 7 or higher is considered positive for IPV, with clinician judgment recommended for a score of 6.

For women who screen positive, we recommend completing an assessment and providing information, intervention, and/or referrals as needed.

c. Time Sensitive Care

Fetal Anatomy Scan

We suggest offering a complete fetal anatomy ultrasound to all pregnant women. Optimal timing of this complete fetal anatomy ultrasound is in the second trimester between 18 and 22 weeks of gestation.[32,33] Routine screening provides a more accurate gestational age assessment (with subsequent lower incidence of induction for post-term pregnancy), earlier detection of multiple gestations, and greater detection of unsuspected fetal abnormalities (with subsequent increased terminations).[34] A complete obstetric sonographic examination should be available to all women, including those considering an invasive test.[35,36]

Fetal Presentation

Fetal presentation should be assessed at 36 weeks gestation in order to determine the need for further treatment.[37] If non-cephalic presentation is suspected, it should be confirmed with ultrasound.[38] Once confirmed, a consultation with the appropriate obstetrical provider should be made immediately to discuss external cephalic version to correct malpresentation.[39,40] Potential benefits of appropriate management of pregnancy would include improved vaginal delivery rates and decreased maternal harm from cesarean delivery.

Postpartum Visit

All women should have a postpartum visit, optimally within six weeks, and no later than eight weeks, after delivery. Postpartum follow-up is specifically encouraged for women who experienced complications during pregnancy, such as hypertensive diseases, gestational and non-gestational DM, and depression. Women with a history of GDM are at increased risk of developing type 2 DM. See the VA/DoD Clinical Practice Guideline for the Management of Type 2 Diabetes Mellitus in Primary Care for more information on diagnostic techniques.[3] Women with hypertensive and metabolic diseases of pregnancy may have increased risk of long-term health problems, particularly lifetime risk of cardiovascular disease. Thus, more accurate diagnosis of conditions such as impaired glucose tolerance has become even more crucial. The obstetric provider should begin the implementation of an individual risk-based surveillance strategy at the postpartum visit, which can be transitioned to the woman's long-term primary care provider. Benefits to the mother may include early identification of health conditions and early initiation of appropriate management methods. During this postpartum visit the provider may also assess contraception initiation, breastfeeding, and mental health disorders.

d. Summary

These assessments and care management methods, including actions completed at every visit, screenings, and time sensitive care, have become the standard of pregnancy care. When combined, all of these factors will help providers determine the appropriate management of pregnancy, potentially including a consult to an advanced prenatal care provider (e.g., obstetrician or maternal-fetal medicine) or another referral as indicated.

[3] See the VA/DoD Clinical Practice Guideline for the Management of Type 2 Diabetes Mellitus in Primary Care. Available at: https://www.healthquality.va.gov/guidelines/cd/diabetes/

IV. Routine Pregnancy Care

The CPG does not address every aspect of routine care. The below information can be used to help guide clinicians during the routine aspects of management of pregnancy. An initial prenatal risk assessment checklist, which can be used to help guide the initial prenatal care appointment and next steps, is included in Table 3. Consideration of antepartum referrals to advanced prenatal care providers can be informed by Table 4.

Table 3. Initial Prenatal Risk Assessment Checklist

	Risk Factors	Nurse Assessment via Questionnaire	Suggested Action
Dating	Uncertain dating criteria	√	Dating ultrasound
	Late presentation	√	Dating ultrasound
Current Issues	Vaginal bleeding	√	Immediate evaluation
	Significant abdominal pain/cramping	√	Immediate evaluation
	Dental complaint	√	Refer to dental
Past Obstetrical History	Recurrent pregnancy loss	√	Refer to infertility specialist or reproductive endocrinologist
	Risk of ectopic pregnancy (prior ectopic pregnancy, prior tubal surgery, current intrauterine device, history of tubal infertility or pelvic inflammatory disease)	√	Refer for evaluation and ultrasound (immediate referral if having bleeding or pain; scheduled referral if asymptomatic)
	Prior macrosomia or prior GDM	√	Obtain early one-hour GCT
	Prior preterm delivery	√	Refer to obstetrician/gynecologist or maternal fetal medicine provider
	Prior second-trimester pregnancy loss	√	Refer to maternal fetal medicine provider
	Prior preeclampsia	√	Refer to obstetrician/gynecologist or maternal fetal medicine provider
	Prior stillbirth	√	Refer to obstetrician/gynecologist or maternal fetal medicine provider
	Prior isoimmunization affected pregnancy	√	Refer to maternal fetal medicine provider
	Cervical surgery (loop electrical excision procedure, cone biopsy) or uterine anomaly	√	Refer to obstetrician/gynecologist or maternal fetal medicine provider
	Prior uterine surgery (myomectomy, metroplasty)	√	Refer to obstetrician/gynecologist or maternal fetal medicine provider
	Bariatric surgery less than 18 months ago	√	Refer to nutrition, obstetrician/gynecologist, or maternal fetal medicine provider
	Prescription or over-the-counter medications or herbal supplements	√	Refer to maternal fetal medicine based on teratogen risk
	Drug/alcohol use	√	Refer to maternal fetal medicine provider
	Tobacco product use	√	Document, educate

	Risk Factors	Nurse Assessment via Questionnaire	Suggested Action
Medical Conditions/ History	Neurological disorder	√	Refer to maternal fetal medicine provider, neurology
	CVD, cardiac anomaly	√	Refer to maternal fetal medicine provider, cardiology
	Hypertension	√	Refer to obstetrician/gynecologist or maternal fetal medicine provider, cardiology
	Pulmonary disease	√	Refer to maternal fetal medicine provider, pulmonology
	Renal disorder (includes pyelonephritis)	√	Refer to maternal fetal medicine provider, nephrology
	DM (Type 1 or 2)	√	Refer to maternal fetal medicine provider, endocrinology Obtain HbA1C
	Family history of DM in first relative	√	Obtain early one-hour GCT
	Thyroid disorders	√	Obtain thyroid function tests
	Autoimmune disorders (lupus, rheumatoid arthritis, anti-phospholipid syndrome)	√	Refer to maternal fetal medicine provider, rheumatology
	Bleeding disorder	√	Refer to maternal fetal medicine provider, hematology
	Clotting disorder	√	Refer to maternal fetal medicine provider, hematology
	Gastrointestinal disorders on medications	√	Refer to maternal fetal medicine provider, gastroenterology
	Sickle cell anemia or carrier	√	Refer to maternal fetal medicine provider, hematology, genetic counselor Hemoglobin electrophoresis if not done for patient and partner
	Cystic fibrosis carrier status	√	Refer to maternal fetal medicine provider, genetic counselor
	History of genetic disease or family history of genetic disease	√	Refer to maternal fetal medicine provider, genetic counselor
	Prior infant with congenital birth defect	√	Refer to maternal fetal medicine provider
	Hepatitis	√	Refer to maternal fetal medicine provider, gastroenterology Pertinent hepatitis labs, liver function tests
	Positive screen for sexually transmitted infection	√	Refer to provider and take appropriate action depending on infection
	Tuberculosis or received Bacillus Calmette–Guérin vaccine	√	Chest x-ray
	HIV	√	Refer to maternal fetal medicine provider, infectious disease
	Rash or viral illness	√	Serology for suspected infection

	Risk Factors	Nurse Assessment via Questionnaire	Suggested Action
Medical Conditions/ History (cont.)	Radiation/toxic chemical exposure since becoming pregnant	√	Refer to maternal fetal medicine provider
	Cancer (current or recent)	√	Refer to maternal fetal medicine provider
	Transplant	√	Refer to maternal fetal medicine provider
	Current or prior depression	√	Refer to behavioral health if suicidal or moderate or severe MDD, unless has established care
	Other mental illness (e.g., anxiety, bipolar, schizophrenia) on or off medications	√	Refer to behavioral health unless has established care
	Deployment related PTSD and/or military sexual trauma	√	Refer to behavioral health unless established care
	Occupational hazards or exposures	√	Refer to occupational health, Refer to maternal fetal medicine provider if teratogen
	Homeless	√	Refer to social services
	Intimate partner violence	√	Refer to social services
	History of infertility	√	Perform transvaginal ultrasound, if not already done
	Diet restriction (e.g., previous bariatric surgery, vegan, vegetarian)	√	Refer to nutrition
	Eating disorder	√	Refer to behavioral health
	BMI <16.5 or >30 kg/m^2	√	Obtain early one-hour GCT if BMI >30 kg/m^2 Refer to nutrition
	Age (<16 or >35 years)	√	Refer to advanced prenatal provider
Additional Information	Currently or previously deployed or family member	√	Refer to social work if desired
	Previous deployment (self)	√	Document
	Lives with cats; educate about not changing litter box	√	Educate
	Eating undercooked meat, high-mercury fish, unpasteurized foods	√	Educate
	Seat belt usage	√	Educate
	Planned pregnancy	√	Document
	Born outside the U.S.	√	Document
	Primary language other than English	√	Document
	Religious preference	√	Document
	Highest level of education	√	Document
	Preferred method of learning	√	Document

	Risk Factors	Nurse Assessment via Questionnaire	Suggested Action
Routine Lab Tests	HIV		Lab
	Complete blood count		Lab
	ABO Rh blood typing		Lab
	Antibody screen		Lab
	Rapid plasma reagin		Lab
	Hepatitis B surface antigen test		Lab
	Rubella IgG		Lab
	Urinalysis and culture		Lab
	Varicella IgG if status unknown		Lab

Abbreviations: BMI: body mass index; CVD: cardiovascular disease; DM: diabetes mellitus; GCT: glucose challenge test; GDM: gestational diabetes mellitus; HbA1C: glycosylated hemoglobin A1c; HIV: human immunodeficiency virus; IgG: immunoglobulin G; kg: kilogram(s); m: meter(s); MDD: major depressive disorder; PTSD: posttraumatic stress disorder; Rh: rhesus; U.S.: United States

Table 4. Potential Indications for Referral to an Advanced Prenatal Care Provider

	Risk Assessed or Identified by Routine Prenatal Care Provider
Obstetric Complications	Short (<2.5 cm) cervix (<24 weeks)
	Malpresentation (>36 weeks)
	Placenta previa (symptomatic or beyond 28 weeks)
	Abnormal amniotic fluid: oligo/polyhydramnios
	Preterm premature rupture of membranes
	Fetal growth abnormality (estimated fetal weight >5,000 g)
	Known or suspected fetal anomaly
	Multiple gestation
	Isoimmunization
	Abnormal prenatal screening result (aneuploidy risk, open NTD, carrier screen)
	Intrauterine fetal demise
	Prior cesarean section
Gynecologic, Medical, and Surgical Conditions	Current need for surgery
	Hematologic disorders (except physiologic anemia)
	Abnormal pap smear
	Prior uterine surgery (myomectomy)
	Breast abnormality
	Illicit drug or alcohol
	TORCH infection

*Referral depends upon local availability of resources and comfort of individual care provider

Abbreviations: cm: centimeter(s); g: gram(s); NTD: neural tube defect; TORCH: toxoplasmosis, other (syphilis, varicella-zoster, parvovirus B19), rubella, cytomegalovirus (CMV), and herpes infections

V. Scope of the CPG

Regardless of setting, any patient in the healthcare system should ideally have access to the interventions that are recommended in the 2018 Pregnancy CPG after taking into consideration the patient's specific circumstances. Guideline recommendations are intended to be patient-centered. Thus, treatment and care should take into account a patient's needs and preferences. Good communication between healthcare professionals and the patient is essential and should be supported by evidence-based information tailored to the patient's needs. Use of an empathetic and non-judgmental approach facilitates discussions sensitive to gender, culture, ethnic, and other differences. The information that patients are given about treatment and care should be culturally appropriate and also available to people with limited literacy skills. It should also be accessible to people with additional needs such as physical, sensory, or learning disabilities. Family involvement should be considered, if appropriate.

This CPG is designed to assist providers in managing or co-managing pregnant women as well as co-occurring conditions. Moreover, the patient population of interest for this CPG is pregnant women who are eligible for care in the VA and DoD healthcare delivery systems. It includes Veterans as well as deployed and non-deployed Active Duty Service, Guard, and Reserve Members and their dependents.

This CPG is based on information available through May 2017. The systematic review conducted for this CPG update targeted 10 key questions (KQs) focusing on the means by which the delivery of healthcare could be optimized for pregnant women. The selected KQs were prioritized by the Work Group from many possible KQs based on consensus as to their level of importance. Due to resource constraints, an extensive review of the evidence for all important aspects of care was not feasible for the update to this CPG.

VI. Methods

The 2018 Pregnancy CPG is an update to the 2009 Pregnancy CPG. The methodology used in developing the 2018 CPG follows the *Guideline for Guidelines*,[1] an internal document of the VA and DoD EBPWG. The *Guideline for Guidelines* can be downloaded from http://www.healthquality.va.gov/policy/index.asp. The guideline development process for the 2018 CPG update consisted of the following steps: formulating and prioritizing KQs, convening patient focus groups, conducting the systematic evidence review, convening a face-to-face meeting with the CPG Champions and Work Group members, and drafting and submitting a final CPG on the management of pregnancy to the VA/DoD EBPWG.

The Champions and Work Group used the Grading of Recommendations Assessment, Development and Evaluation (GRADE) system to assess the quality of the evidence base and assign a strength for each recommendation. The GRADE system uses the following four domains to assess the strength of each recommendation:[25]

- Balance of desirable and undesirable outcomes
- Confidence in the quality of the evidence
- Patient or provider values and preferences
- Other implications, as appropriate, e.g.,:
    - Resource use

- Equity
- Acceptability
- Feasibility
- Subgroup considerations

Using these four domains, the Work Group determined the relative strength of each recommendation ("Strong" or "Weak"). A "Strong" recommendation generally indicates a high confidence in the quality of the available scientific evidence, a clear difference in magnitude between the benefits and harms of an intervention, similar patient or provider values and preferences, and understood influence of other implications (e.g., resource use, feasibility). If the Work Group has less confidence after the assessment across these domains and believes that additional evidence may change the recommendation, it generally assigns a "Weak" recommendation. It is important to note that the GRADE terminology used to indicate the assessment across the four domains (i.e., Strong vs. Weak) should not be confused with the clinical importance of the recommendation. A weak recommendation may still be important to the clinical care of a pregnant patient.

Occasionally, instances may occur when the Work Group feels there is insufficient evidence to make a recommendation for or against a particular therapy or preventive measure. This can occur when there is an absence of studies on a particular topic that met evidence review inclusion criteria, studies included in the evidence review report conflicting results, or studies included in the evidence review report inconclusive results regarding the desirable and undesirable outcomes.

Using these elements, the grade of each recommendation is presented as part of a continuum:

- Strong for (or "We recommend offering this option …")
- Weak for (or "We suggest offering this option …")
- No recommendation for or against (or "There is insufficient evidence…")
- Weak against (or "We suggest not offering this option …")
- Strong against (or "We recommend against offering this option …")

The grade of each recommendation made in the 2018 CPG can be found in the section on Recommendations. Additional information regarding the use of the GRADE system can be found in Appendix A in the full Pregnancy CPG.

The Work Group developed both new and updated recommendations based on the evidence review conducted for the priority areas addressed by the KQs. In addition, the Work Group considered, without complete review of the relevant evidence, the current applicability of other recommendations that were included in the 2009 Pregnancy CPG, subject to evolving practice in today's environment. A set of recommendation categories was adapted from those used by the National Institute for Health and Care Excellence (NICE).[41,42] These categories, along with their corresponding definitions, were used to account for the various ways in which recommendations could have been updated from the 2009 Pregnancy CPG. The categories and definitions can be found in Table 5.

Table 5. Recommendation Categories and Definitions

Evidence Reviewed*	Recommendation Category*	Definition*
Reviewed	New-added	New recommendation following review of the evidence
	New-replaced	Recommendation from previous CPG that has been carried over to the updated CPG that has been changed following review of the evidence
	Not changed	Recommendation from previous CPG that has been carried forward to the updated CPG where the evidence has been reviewed but the recommendation is not changed
	Amended	Recommendation from the previous CPG that has been carried forward to the updated CPG where the evidence has been reviewed and a minor amendment has been made
	Deleted	Recommendation from the previous CPG that has been removed based on review of the evidence
Not reviewed	Not changed	Recommendation from previous CPG that has been carried forward to the updated CPG, but for which the evidence has not been reviewed
	Amended	Recommendation from the previous CPG that has been carried forward to the updated CPG where the evidence has not been reviewed and a minor amendment has been made
	Deleted	Recommendation from the previous CPG that has been removed because it was deemed out of scope for the updated CPG

*Adapted from the NICE guideline manual (2012) [41] and Garcia et al. (2014) [42]

Abbreviation: CPG: clinical practice guideline

VII. Guideline Work Group

Guideline Work Group*	
Department of Veterans Affairs	**Heather Able, MSN, RNC (Champion)**
	Alicia Christy, MD, MHSCR, FACOG (Champion)
	Grace Chang, MD, MPH
	Megan Gerber, MD, MPH
	Barbara J. Hector, WHNP
	Carrie Kairys, DNP, FNP-BC
	Jacqueline H. Langston, BSN, RN, CNM
	Laura J. Miller, MD
	Ki Park, MD, MS, FSCAI
	Deanna Rolstead, MD, FACOG
Department of Defense	**COL Lisa Foglia, MD, FACOG (Champion)**
	Lt Col Barton Staat, MD, FACOG (Champion)
	CPT Allison M. DeLuca, CNM, RN
	Maj Minette Herrick, MS, RDN, IBCLC
	LT Karla Krasnoselsky, DPT, CSCS
	MAJ Sheila A. Medina, DNP, FNP-C
	COL Cynthia Sanchez, MSN, RN
	CDR Robert Selvester, MD
	Kristi Shearer, PhD
	Elaine P. Stuffel, BSN, RN, MHA
	CDR Christopher Tatro, MD, FACOG
Office of Quality, Safety and Value Veterans Health Administration	M. Eric Rodgers, PhD, FNP-BC
	James Sall, PhD, FNP-BC
	Rene Sutton, BS, HCA
Office of Evidence Based Practice U.S. Army Medical Command	Corinne K. B. Devlin, MSN, RN, FNP-BC
	Elaine P. Stuffel, BSN, RN, MHA
The Lewin Group	Clifford Goodman, PhD
	Christine Jones, MS, MPH, PMP
	Erika Beam, MS
	Anjali Jain, MD
	Nicolas Stettler-Davis, MD, MSCE
ECRI Institute	Kristen D'Anci, PhD
	James Reston, PhD, MPH
	Jeff Oristaglio, PhD
	Amy Tsou, MD
	Gina Giradi, MS
	Michele Datko, MLS
Sigma Health Consulting, LLC	Frances Murphy, MD, MPH
DutyFirst Consulting	Anita Ramanathan, BA
	Megan McGovern, BA

*Additional contributor contact information is available in Appendix E in the full CPG.

VIII. Patient-centered Care

VA/DoD CPGs encourage clinicians to use a PCC approach that is individualized based on patient capabilities, needs, goals, prior treatment experience, and preferences. Regardless of setting, all patients in the healthcare system should be offered access to evidence-based interventions appropriate to that patient. When properly executed, PCC may decrease patient anxiety, increase trust in clinicians,[43] and improve treatment adherence.[44] Improved patient-clinician communication through PCC can be used to convey openness to discuss any future concerns.

As part of the PCC approach, clinicians should review the outcomes of previous healthcare experiences with the pregnant woman. Additionally, they should involve the patient in prioritizing rehabilitation goals and setting specific goals regardless of the selected setting or level of care.

Healthcare coverage may factor into a pregnant woman's decision making process regarding her care. However, healthcare coverage for each woman may vary. Therefore, it may be helpful for pregnant women to discuss their coverage with the appropriate VA or DoD representative. Pregnant women who obtain their healthcare coverage through the VA should talk to their Maternity Care Coordinator. Pregnant women who obtain their healthcare coverage through the DoD should talk to their TRICARE representative.

IX. Shared Decision Making

Throughout this VA/DoD CPG, the authors encourage clinicians to focus on shared decision making (SDM). The SDM model was introduced in *Crossing the Quality Chasm,* an Institute of Medicine (IOM) (now called the National Academy of Medicine [NAM]) report, in 2001.[45] It is readily apparent that pregnant women, together with their clinicians, make decisions regarding their plan of care and management options. Pregnant women require sufficient information and time to be able to make informed decisions. Clinicians must be adept at presenting information to their patients regarding individual treatments, expected outcomes, and levels and/or locations of care. During pregnancy, this includes presenting the mother, and her support system as appropriate, information about maternal and fetal risks of untreated symptoms and maternal and fetal benefits and risks of proposed care. Clinicians are encouraged to use SDM to individualize treatment goals and plans based on patient capabilities, needs, goals, prior pregnancy experience, and preferences.

X. Discussion of Recommendations

A. Care Throughout Pregnancy

a. Routine Care During Pregnancy

1. We suggest offering a group model of prenatal care as an acceptable alternative to individual provider appointments. *(Weak for; Not reviewed, Amended)*

- A recent meta-analysis of group prenatal care versus traditional prenatal care did not find significant benefits to group prenatal care over traditional prenatal care.[46] However, there was no evidence of harm and other outcomes such as patient satisfaction, contraception initiation, and depression were not examined.

- One study demonstrated that women assigned to group prenatal care were less likely to experience preterm delivery than those receiving standard prenatal care.[47]
- A group model may fit better with the values and preferences of some pregnant woman than the individual model.

2. **We recommend that all healthy, pregnant women without known contraindications participate in regular mild to moderate exercise sessions, three or more times per week. *(Strong for; Reviewed, Amended)***

   - Moderate level evidence shows that healthy pregnant women benefit most from completing at least 150 minutes per week of mild to moderate intensity exercise, with limited risk to mother and baby.[48] Studies included in the evidence review overwhelmingly used three or more sessions per week.[48-53]
   - Exercise can reduce excess maternal weight gain, incidence of fetal macrosomia in newborns, and rates of neonatal respiratory distress, GDM, depression, and cesarean deliveries.[48-55] There is no evidence to suggest that exercise causes preterm births, underweight newborns, stillbirths, or increased incidence of shoulder dystocia or induction of labor.[48-55]
   - Women should be educated on how to calculate or identify mild to moderate intensity to better recognize exercises that are right for them. Estimation can include percentage of heart rate, metabolic equivalent levels, and the Borg Rate of Perceived Exertion.[56] Further information on exercise intensity can be found in the VA/DoD Clinical Practice Guideline for Screening and Management of Obesity and Overweight[4] and through the CDC website[5].
   - Women with healthy pregnancies can continue their pre-pregnancy exercise routine throughout pregnancy. Previously sedentary women can slowly start a new exercise routine during pregnancy, consisting of aerobic exercise and strength training, without increase risk.[48]
   - Medical conditions that may warrant referral for a supervised exercise program include moderate or severe anemia, preeclampsia, gestational hypertension, poorly controlled chronic hypertension, unevaluated maternal cardiac arrhythmia, chronic bronchitis, poorly controlled type 1 DM, extreme morbid obesity, extreme underweight (BMI <12 kg/m^2), extremely sedentary lifestyle, fetal growth restriction in current pregnancy, orthopedic limitations, poorly controlled seizure disorder, poorly controlled hyperthyroidism, and heavy smoking.[55]

3. **We suggest that women with uncomplicated pregnancies continue a standard work schedule throughout their pregnancy. *(Weak for; Not reviewed, Amended)***

   - Physically demanding work and prolonged standing (more than three hours at a time with little movement) increases risk for preterm birth and hypertension or preeclampsia.[57-60] Thus, if a pregnant women's work is strenuous (e.g., involves industrial machines, requires significant physical exertion), she should limit her work week to 40 hours and workday to eight hours during the last trimester or earlier if she frequently experiences symptoms of preterm labor.

[4] See the VA/DoD Clinical Practice Guideline for Screening and Management of Obesity and Overweight. Available at: https://www.healthquality.va.gov/guidelines/cd/obesity/

[5] The Centers for Disease Control and Prevention website on physical activity is available at: https://www.cdc.gov/physicalactivity/index.html.

- Active Duty Service Members should continue to follow their service-specific profiling regulations.

b. Nutrition

4. We recommend folic acid (at least 400 micrograms daily) to be taken starting one month before conception and continued throughout pregnancy and breastfeeding. *(Strong for; Not reviewed, Amended)*

- Neural tube defects (NTDs), one of the most common major congenital anomalies in the U.S., occur at a very early gestational age. Studies have found that preconception folic acid supplements, either alone or combined with other vitamins or minerals (e.g., in a multivitamin), reduces risk of NTDs and should be continued through the first trimester.[61-63] Folic acid supplementation has not been found to be associated with serious harms.[64,65]

c. Screening

5. We recommend screening for use of tobacco, alcohol, illicit drugs, and unauthorized use of prescription medication because their use is common and can result in adverse outcomes. For women who screen positive, we recommend additional evaluation and treatment (see VA/DoD Clinical Practice Guidelines for the Management of Substance Use Disorders[6] and the Management of Tobacco Use[7]). *(Strong for; Reviewed, Amended)*

- Prenatal exposure to substances may increase the risk of congenital anomalies and long-term adverse effects.
- Smoking may limit fetal growth leading to low birth weight, reduced birth length, or head circumference.[66]
- Alcohol is a known teratogen and leads to abnormalities with the head, kidney, liver, gastrointestinal tract, endocrine system, and brain.[67]
- Risks of prenatal cannabis exposure are unknown.[66]
- Prenatal codeine, methadone, or heroin use has been found to be associated with a higher incidence of congenital abnormalities.[106]
- Prenatal use of opioids is associated with neonatal abstinence syndrome (symptoms of central nervous system irritability, gastrointestinal dysfunction, and temperature instability).[68]
- Due to the harm associated with substance use, screening for tobacco, alcohol, illicit drugs, and non-prescribed use of medication is recommended, followed by additional evaluation and treatment based on screening results.

[6] See the VA/DoD Clinical Practice Guideline for the Management of Substance Use Disorders. Available at: https://www.healthquality.va.gov/guidelines/mh/sud/

[7] See the Clinical Practice Guideline for the Management of Tobacco Use. Available at: https://www.healthquality.va.gov/CPGArchives.asp

6. **We recommend screening for depression using a standardized tool such as the Edinburgh Postnatal Depression Scale or the 9-item Patient Health Questionnaire periodically during pregnancy and postpartum. *(Strong for; Reviewed, New-replaced)***

   - Moderate quality evidence suggests that screening pregnant and postpartum women for depression using a validated screening tool is more effective than usual clinical assessment in detecting depression and in reducing depressive symptoms, particularly when done with access to interventions such as treatment protocols, care management, and trained clinicians.[69] Providers should screen patients periodically, such as at first presentation, week 28, and at the postpartum visit.
   - Given the high prevalence of perinatal depression, adverse maternal and offspring effects of untreated perinatal depressive symptoms, and low rates of detection and treatment entry in the absence of screening, the benefits of screening were determined to outweigh any harms.
   - The Edinburgh Postnatal Depression Scale (EPDS) and the 9-item Patient Health Questionnaire (PHQ-9) are among the screening tools which have been validated for perinatal use.
   - Using depression screens may not detect other perinatal psychiatric disorders, such as bipolar disorder, anxiety disorders, or posttraumatic stress disorder (PTSD). It is important to have other methods in place to detect these disorders. Screening is not necessary for pregnant women who have already been diagnosed with a psychiatric disorder and are engaged in mental health treatment.

d. Education

7. **We recommend breastfeeding education, assessment, and support to all pregnant women and their families at the first visit and throughout the pregnancy and postpartum period using open-ended questions such as "What do you know about breastfeeding?" *(Strong for; Reviewed, New-replaced)***

   - The World Health Organization (WHO) recommends initiation of breastfeeding within the first hour of life and exclusive breastfeeding for at least six months.[70] Breastfeeding has been shown to lower the risk of type 2 DM, certain types of breast cancer, and ovarian cancer in mothers and asthma, childhood leukemia, and type 2 DM in children.[71,72]
   - Education about breastfeeding should start prenatally (ideally at the first visit), be continued throughout the pregnancy, include the pregnant woman's family or chosen support people, and be tailored to the needs and resources of the community.
   - Breastfeeding assessment in the prenatal period should include breast examination to screen for potential breastfeeding challenges, such as those related to inverted or "flat" nipples, history of breast augmentation or reduction, suspected breast hypoplasia or insufficient glandular tissue, past breastfeeding experience/perceptions, use of medications known to interfere with milk production, basic education pertaining to the benefits of breastfeeding and local resources and support programs available. As indicated, pregnant women should be referred to a certified lactation consultant (as available) for additional lactation support and education.

B. One-time Interventions

a. Screening and Diagnostic Testing

8. We suggest making prenatal diagnostic testing for aneuploidy available to all pregnant women. *(Weak for; Reviewed, New-replaced)*

- There are no RCTs or systematic reviews evaluating the overall benefits of offering prenatal diagnostic testing to all pregnant women. The Work Group's confidence in the quality of the evidence is low, except regarding risk of pregnancy loss with procedures for which the confidence in the quality of the evidence is high.
- The benefits of invasive prenatal diagnostic testing include improving the ability to plan and to make more informed pregnancy and birth management decisions.
- Pregnant women considering invasive prenatal diagnostic testing should be counseled about the risks, benefits, limitations, and alternatives to invasive testing by a provider qualified to conduct this counseling.[73]

9. We recommend offering prenatal screening for aneuploidy and the most common clinically significant genetic disorders to all pregnant women. When aneuploidy screening is desired, cell-free fetal DNA screening should be considered; however, screening test selection should be individualized and take into account the patient's age, baseline aneuploidy risk, and test performance for a given condition. *(Strong for; Reviewed, New-replaced)*

- Benefits of testing are that, if the testing is positive, women have time to become educated about having a child with a genetic disorder and consult with providers who may be involved in the care of their child. Benefits may be greatest for women who are at high risk of aneuploidy (e.g., greater maternal age).
- There are multiple aneuploidy screening tests available. Each test's performance has different sensitivity, specificity, and positive and negative predictive values, which are affected by the a priori risk of a given aneuploidy based on maternal age. Resource use also varies between tests.
- Cell-free fetal DNA (cffDNA) screening has the highest sensitivity and specificity of the available screening tests for Down syndrome in high risk women.[74-79] The test also screens for trisomy 18 and trisomy 13, but has lower detection rates for these conditions.
- Adequate pre-test counseling is required for all aneuploidy screening tests. The ability to provide post-test counseling for pregnant women who screen negative, as well as the availability of timely post-test counseling and diagnostic prenatal testing for pregnant women who screen positive, is necessary.

10. We suggest the two-step process (one-hour oral glucose challenge test followed by three-hour oral glucose tolerance test) to screen for gestational diabetes mellitus at 24-28 weeks gestation for all pregnant women. *(Weak for; Reviewed, New-replaced)*

- Pregnant women with GDM are at increased risk for developing fetal macrosomia and requiring operative delivery. Uncontrolled or poorly controlled GDM may also lead to neonatal morbidity, such as hypoglycemia, polycythemia, and hyperbilirubinemia. Early, appropriate treatment may lead to a reduction in hypertensive disorders in pregnancy, a decrease in cesarean deliveries,

and a decrease in macrosomia.[80] Therefore, any pregnant woman with GDM should have additional surveillance and management beyond the scope outlined in this guideline.

- For most women, screening for GDM should be undertaken at 24-28 weeks gestation. It is typically diagnosed using a two-step process.[81-83]
- Women with risk factors for GDM (e.g., history of GDM in prior pregnancy, previous delivery of a macrosomic infant [>4,000 g], pre-pregnancy BMI >30 kg/m^2, first degree relative with DM, and certain high-risk ethnic groups [e.g., Native Americans, Hispanics, Pacific Islanders]) [84] may benefit from earlier screening and treatment, but should be re-screened at 24-28 weeks if initial testing is normal.

b. Imaging

11. We recommend first-trimester ultrasound to establish or confirm the gestational age and estimated birth date, identify multiple pregnancies, and confirm the presence of cardiac activity.

For pregnant women who present after the first trimester, we suggest performing a dating and anatomical ultrasound at the earliest opportunity, preferably prior to 22 weeks. *(Strong for; Reviewed, New-replaced)*

- Reliable gestational age is crucial for assessment of fetal size and growth since this may influence management decisions that could, in turn, influence outcomes at peri-viable gestational ages. Self-report of last menstrual period is often used to estimate gestational age but may be unreliable.[85]
- Ultrasonography before 20 weeks gestation is generally viewed as a more accurate method of estimating gestational age than menstrual dating.

c. Preparing for Delivery

12. We recommend offering scheduled delivery to women who reach 41 weeks and 0/7 days undelivered. Antepartum fetal testing should begin at 41 weeks and 0/7 days if not scheduled for delivery. *(Strong for; Not reviewed, Amended)*

- Gestational age beyond 40 weeks is associated with increasing risk of perinatal death and perinatal complication. Perinatal complications after 41 weeks gestational age have also been documented to include asphyxia, fetal distress, sepsis, and meconium aspiration.[86,87]
- A Cochrane review (2012) identified that a policy of labor induction at 42 weeks gestational age compared to expectant management is associated with fewer perinatal deaths and fewer cesarean births.[87] There is moderate confidence in the quality of the current evidence that women of all ages reduce their negative neonatal outcomes by delivering before 41 and 0/7.[88] Studies have also shown an equal or lower rate of cesarean delivery in women for whom pregnancy is induced at 41 weeks compared to women for whom expectant management is used.[89,90]
- Counseling women in order to make an informed decision about scheduled inductions or antepartum fetal monitoring without induction will help prioritize pregnant women's values. Some women may value immediate delivery, while others may prefer to wait.

d. Postpartum Care

13. For pregnant women who have a past or current history of gestational diabetes mellitus, hypertension, or preeclampsia, we recommend documenting the reproductive history and making women aware of the increased lifetime risks of cardiovascular disease and/or diabetes. *(Strong for; Reviewed, New-added)*

- During pregnancy, there are dramatic shifts in blood volume, hemodynamics, and lipid/glucose metabolism to accommodate the growing needs of the fetus. However, these adaptive mechanisms may become dysregulated and lead to adverse clinical outcomes in both the mother and fetus. These adverse conditions that occur during pregnancy can serve as a marker of future maternal cardiovascular, metabolic, and possible rheumatologic risk. Such adverse conditions include hypertensive conditions of pregnancy, including gestational hypertension and preeclampsia, as well as GDM.[91-105]
- Primary care providers should obtain a reproductive history yearly in women of childbearing age; a one-time assessment in women who are postmenopausal without prior history of cardiovascular disease (CVD) is sufficient. Specifically, inquiry should be focused on a history of gestational hypertension/preeclampsia (previously known as toxemia) and GDM.
- Benefits of awareness of lifetime risk and regular cardiovascular screening in these women outweigh harms.

C. Referral

14. We suggest that pregnant women with an unexplained elevation of maternal serum alpha-fetoprotein be evaluated and counseled by a qualified obstetric provider due to increased risk for adverse perinatal outcomes. *(Weak for; Not reviewed, Amended)*

- Studies have indicated an increased risk of adverse outcomes, such as preterm birth, preterm rupture of membranes, preeclampsia, fetal growth restriction, and intrauterine fetal death with unexplained elevated alpha-fetoprotein.[106-108]
- The benefits of this recommendation slightly outweigh the harms and burdens. The benefit is that women with elevated maternal serum alpha-fetoprotein (MSAFP) would undergo heightened surveillance and possible earlier detection of preeclampsia or fetal growth restriction. They could also be identified as of greater benefit from prophylactic aspirin for prevention of preeclampsia. However, there may be a subgroup of women with complications that cannot be predicted and knowledge of test results may increase anxiety.

15. We recommend against routine screening for preterm birth using the fetal fibronectin test in asymptomatic women. *(Strong against; Not reviewed, Amended)*

16. We recommend considering the use of fetal fibronectin testing as a part of the evaluation strategy in women between 24 and 34 6/7 weeks gestation with signs and symptoms of preterm labor, particularly in facilities where the result might affect management of delivery. *(Strong for; Not reviewed, Amended)*

- Fetal fibronectin testing has a narrowly defined role in obstetric evaluation, and therefore should only be used when it has the potential to alter care. Several prospective cohort studies have

shown no improvement in outcomes for either mother or baby.[109,110] The potential value of fetal fibronectin testing in the setting of evaluation or triage of preterm labor is to more precisely discriminate between the subset of women who have true preterm labor versus false labor.[111]

- In a woman at low risk for preterm birth presenting with preterm contractions, a negative test may inform the decision to use or avoid tocolytics and corticosteroids.[110] Alternatively, a positive test may allow providers at some facilities to arrange transfer of women identified as at higher risk of preterm delivery to facilities better suited to manage the complications of a preterm birth.
- In asymptomatic women, the low positive and negative predictive values limit the test's value in medical decision making. Recent studies have found that there is no benefit of fetal fibronectin testing in asymptomatic women and it is associated with increased use of resources.[112,113]

D. Subpopulations

a. High Risk for Preeclampsia

DI. In women at risk of preeclampsia, we recommend low dose (e.g., 100-150 mg daily) aspirin therapy initiated at or before 16 weeks gestation. *(Strong for; Reviewed, New-added)*

- A systematic review and meta-analysis, including 45 RCTs totaling over 20,000 pregnant women taking 60-150 mg aspiring daily found that low-dose aspirin therapy initiated at or before 16 weeks gestation, resulted in a significant reduction in preeclampsia, severe preeclampsia, and fetal growth restriction.[252]
- A dose response effect was observed with higher dosages of aspirin being associated with greater risk reduction of the three outcomes. In a comparison between 60 mg and 100 mg aspirin daily, there was no significant impact of 60 mg/day of aspirin on the prevalence of preeclampsia, severe preeclampsia, or fetal growth restriction. Initiating 100 mg/day of aspirin before 16 weeks gestation proved to be the most beneficial.[252]

b. High Risk for Preterm Delivery

DII. We recommend antenatal progesterone therapy in consultation with an advanced prenatal care provider (e.g., maternal fetal medicine provider, perinatologist) for women at high risk for recurrent preterm delivery and who meet the generally accepted inclusion criteria. *(Strong for; Not reviewed, Amended)*

- Studies show that the administration of progesterone intramuscularly or intravaginally beginning early in pregnancy in women at high risk for preterm birth significantly reduces the rate of preterm delivery.[114-116] Specifically, women with a prior spontaneous birth at less than 37 weeks gestation benefit from the administration of progesterone.
- Progesterone therapy is typically started early in the second trimester and continued until approximately 36 weeks. Both intramuscular 17 alpha-hydroxyprogesterone caproate (250 mg, administered weekly) and vaginal progesterone suppositories (100-200 mg, administered once daily) have been found to be effective.[114-116]

c. Over 44 Years of Age

19. We suggest offering women greater than 44 years of age planned delivery at 38 weeks gestational age to reduce the risk of stillbirth. *(Weak for; Reviewed, New-added)*

- Advanced maternal age has been associated with higher rates of late-term stillbirths.[117] Compared with women under 35 years of age, women of advanced maternal age appear to reach late-term stillbirth rates at an earlier gestational age.[118] In addition to the adverse psychological consequences associated with stillbirth, women of advanced maternal age are also less likely to become pregnant again.
- One retrospective cohort study of over 16 million pregnancies found that only mothers over the age of 44 reduced prenatal mortality risk with immediate delivery at 38 weeks gestation. The relative risk of stillbirth was decreased in women over the age of 44 (relative risk: 0.35, 95% confidence interval: 0.14-0.90) with planned delivery at 38 weeks compared to expectant management.[119]

d. History of Bariatric Surgery

20. We suggest that women who have undergone bariatric surgery should be evaluated for nutritional deficiencies and need for nutritional supplementation where indicated (e.g., vitamin B12, folate, iron, calcium). *(Weak for; Reviewed, New-replaced)*

21. For pregnant women who have undergone bariatric surgery, there is insufficient evidence to recommend for or against the routine supplementation of vitamins A, D, E, or K. *(N/A; Reviewed, New-replaced)*

- Although obesity is common and utilization of bariatric surgery has been increasing, there is very little high quality evidence to support best practices during pregnancy.
- Pregnancies in women after bariatric surgery may need additional care other than routine prenatal care, as unique risks may be present. Bariatric surgeries may create a risk for nutritional deficiencies during pregnancy. Thus, patients may be advised to defer pregnancy for at least 18 months after surgery.
- There are minimal risks and potential benefits to evaluation and supplementation for vitamin B12, folate, iron, and calcium.[120,121]

22. We suggest that pregnant women with a history of gastric bypass surgery be evaluated by a surgeon with bariatric expertise. *(Weak for; Reviewed, Amended)*

- Post-bariatric surgery nutritional deficiencies can be avoided with adequate dietary intake but can be readily addressed and treated when appropriately identified.[122]
- One prospective study found that laparoscopic adjustable gastric banding prior to pregnancy was safe for both mother and newborn.[123] Another prospective study found that pregnancy outcomes were similar between obese women who underwent laparoscopic adjustable gastric banding prior to pregnancy and the general community, rather than those of obese women.[124] Generally accepted standard of practice for surgeons and dietitians is to follow up with these patients to monitor for surgical complications as well as nutritional adequacy and any potential deficiencies associated with the procedure.

- The Academy of Nutrition and Dietetics (AND) recommends screening for these nutritional risks and subsequent assessment by an RDN to evaluate the pregnant woman for nutritional adequacy during this phase of life.[29] In addition to post-bariatric pregnant women, others with higher risk of nutritional complications include those who are vegetarian or vegan; avoid certain foods (e.g., due to food allergies, cultural reasons, fad diets); are breastfeeding while pregnant; are underweight with a BMI <18.5 kg/m^2; are age <17 years old; have a multiple gestation pregnancy; have a history of hypertension, hyperlipidemia, DM, or GDM; have an eating disorder; and/or are identified as food insecure.

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