JAMA | US Preventive Services Task Force | RECOMMENDATION STATEMENT

Screening for Hypertensive Disorders of Pregnancy
US Preventive Services Task Force Final Recommendation Statement

US Preventive Services Task Force

IMPORTANCE Hypertensive disorders of pregnancy are among the leading causes of maternal morbidity and mortality in the US. The rate of hypertensive disorders of pregnancy has been increasing from approximately 500 cases per 10 000 deliveries in 1993 to 1021 cases per 10 000 deliveries in 2016 to 2017.

OBJECTIVE The US Preventive Services Task Force (USPSTF) commissioned a systematic review to evaluate the benefits and harms of screening for hypertensive disorders of pregnancy.

POPULATION Pregnant persons without a known diagnosis of a hypertensive disorder of pregnancy or chronic hypertension.

EVIDENCE ASSESSMENT The USPSTF concludes with moderate certainty that screening for hypertensive disorders in pregnancy with blood pressure measurements has substantial net benefit.

RECOMMENDATION The USPSTF recommends screening for hypertensive disorders in pregnant persons with blood pressure measurements throughout pregnancy. (B recommendation)

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Summary of Recommendation

Population	Recommendation	Grade
Asymptomatic pregnant persons	The USPSTF recommends screening for hypertensive disorders in pregnant persons with blood pressure measurements throughout pregnancy.	B

USPSTF indicates US Preventive Services Task Force.

See the Summary of Recommendation figure.

Pathway to Benefit

To achieve the benefit of screening, it is important that persons who screen positive receive evidence-based management of hypertensive disorders of pregnancy.

Preamble

The US Preventive Services Task Force (USPSTF) makes recommendations about the effectiveness of specific preventive care services for patients without obvious related signs or symptoms to improve the health of people nationwide.

It bases its recommendations on the evidence of both the benefits and harms of the service and an assessment of the balance. The USPSTF does not consider the costs of providing a service in this assessment.

The USPSTF recognizes that clinical decisions involve more considerations than evidence alone. Clinicians should understand the evidence but individualize decision making to the specific patient or situation. Similarly, the USPSTF notes that policy and coverage decisions involve considerations in addition to the evidence of clinical benefits and harms.

The USPSTF is committed to mitigating the health inequities that prevent many people from fully benefiting from preventive services. Systemic or structural racism results in policies and practices, including health care delivery, that can lead to inequities in health.

Table. Summary of USPSTF Rationale

Rationale	Assessment
Detection	• Based on foundational evidence, the USPSTF has previously established that there is adequate evidence on the accuracy of blood pressure measurements to screen for preeclampsia. • The USPSTF found inadequate evidence that any other screening approach is more accurate than regular blood pressure measurements at office visits in identifying persons with hypertensive disorders of pregnancy.
Benefits of early detection and intervention and treatment (based on direct or indirect evidence)	• There is no evidence that directly compares maternal and perinatal morbidity and mortality in persons screened for hypertensive disorders in pregnancy vs those who are not screened. • The USPSTF found inadequate evidence on whether any other screening approach for hypertensive disorders of pregnancy reduces maternal and perinatal morbidity and mortality more than regular blood pressure measurements at office visits. • The USPSTF previously found adequate evidence that the well-established treatments of preeclampsia result in a substantial benefit for the mother and infant by reducing maternal and perinatal morbidity and mortality.
Harms of early detection and intervention and treatment	• There is inadequate direct evidence on the harms of the different screening approaches used to identify hypertensive disorders of pregnancy. • The USPSTF previously found adequate evidence to bound the harms of screening for and treatment of hypertensive disorders in pregnancy as no greater than small. This assessment was based on the known harms of treatment with antihypertension medications, induced labor, and magnesium sulfate; the likely few harms from screening with blood pressure measurements; and the potential poor maternal and perinatal outcomes resulting from severe untreated preeclampsia and eclampsia.
USPSTF assessment	The USPSTF concludes with moderate certainty that screening for hypertensive disorders in pregnancy with blood pressure measurements has a substantial net benefit.

Abbreviation: USPSTF, US Preventive Services Task Force.

The USPSTF recognizes that race, ethnicity, and gender are all social rather than biological constructs. However, they are also often important predictors of health risk. The USPSTF is committed to helping reverse the negative impacts of systemic and structural racism, gender-based discrimination, bias, and other sources of health inequities, and their effects on health, throughout its work.

Importance

Hypertensive disorders of pregnancy include gestational hypertension, preeclampsia and eclampsia, and chronic hypertension with superimposed preeclampsia.[1-3]

Hypertensive disorders of pregnancy are among the leading causes of maternal morbidity and mortality in the US.[4] The rate of hypertensive disorders of pregnancy has been increasing from approximately 500 cases per 10 000 deliveries in 1993 to 1021 cases per 10 000 deliveries in 2016 to 2017.[4] Serious maternal morbidities associated with hypertensive disorders of pregnancy, in particular preeclampsia, include cerebrovascular accidents, retinal detachment, organ damage or failure, and eclamptic seizures. Hypertensive disorders of pregnancy (including preeclampsia) were responsible for 6.8% of pregnancy-related deaths in the US during 2014 to 2017.[5] Most deaths attributed to hypertensive disorders of pregnancy (65%) occur in the 6 weeks following delivery.[6] Adverse perinatal outcomes for the fetus and newborn include intrauterine growth restriction, low birth weight, and stillbirth.[1,3] Many of the complications associated with preeclampsia lead to early induction of labor or cesarean delivery and preterm birth. Preeclampsia has been estimated to account for 6% of preterm births and 19% of medically indicated preterm births in the US.[7] Having any hypertensive disorder of pregnancy (particularly preeclampsia) is associated with an increased risk of maternal chronic hypertension and cardiovascular disease later in life.[8-10]

In the US, Black persons experience higher rates of maternal and infant morbidity and perinatal mortality than other racial and ethnic groups and are at greater risk for developing hypertensive disorders of pregnancy than other pregnant persons.[1,11,12] In 2019, the maternal mortality rate (maternal deaths during and up to 42 days postpartum) was higher among Black persons than among White persons (44.0 per 100 000 live births vs 17.9 per 100 000 live births, respectively).[13] Hypertensive disorders of pregnancy account for a larger proportion of pregnancy-related morbidity and mortality among Black populations than White populations.[14-19] Approximately two-thirds of Black persons with preeclampsia are diagnosed with having severe symptoms, compared with fewer than half of White persons developing preeclampsia.[14,17] These disparities in disease severity contribute to the higher overall maternal mortality rates observed in Black populations.[20] The risk of dying of eclampsia and preeclampsia is about 5 times greater for Black individuals (3.93 maternal deaths per 100 000 live births) than for White individuals (0.78 maternal deaths per 100 000 live births).[1,18]

Pregnancy-related mortality among Native American/Alaska Native persons is also elevated compared with White persons (29.7 maternal deaths vs 12.7 maternal deaths per 100 000 live births in 2007 to 2016, respectively), with hypertensive disorders of pregnancy accounting for 12.8% of pregnancy-related deaths.[14] Native American/Alaska Native individuals have significantly higher severe maternal morbidity rates compared with other racial and ethnic groups (11.7% vs 3.9% for White individuals).[20]

USPSTF Assessment of Magnitude of Net Benefit

The US Preventive Services Task Force (USPSTF) concludes with moderate certainty that screening for hypertensive disorders in pregnancy with blood pressure measurements has **substantial net benefit**.

See the **Table** for more information on the USPSTF recommendation rationale and assessment and the eFigure in the Supplement for information on the recommendation grade. See the **Figure** for a summary of the recommendation for clinicians. For more details on

Figure. Clinician Summary: Screening for Hypertensive Disorders of Pregnancy

What does the USPSTF recommend?	**Pregnant persons:** Screen for hypertensive disorders of pregnancy with blood pressure measurements throughout pregnancy. Grade: B
To whom does this recommendation apply?	This recommendation applies to all pregnant women and pregnant persons of all genders without a known diagnosis of a hypertensive disorder of pregnancy or chronic hypertension.
What's new?	This recommendation is consistent with the 2017 USPSTF recommendation statement on screening for preeclampsia. The USPSTF broadened the scope of the updated review to screening for hypertensive disorders of pregnancy.
How to implement this recommendation?	• Blood pressure measurements should be obtained during each prenatal care visit throughout pregnancy. If a patient has an elevated blood pressure reading, the reading should be confirmed with repeated measurements. • To achieve the benefit of screening, it is important that persons who screen positive receive evidence-based management of hypertensive disorders of pregnancy.
What additional information should clinicians know about this recommendation?	While it is known that risk continues into the immediate postpartum period, there is little evidence regarding screening during this period. A pragmatic approach would be for patients to be counseled regarding signs and symptoms of preeclampsia at hospital discharge and for patients with hypertensive disorders to have subsequent blood pressure checks.
Why is this recommendation and topic important?	Hypertensive disorders of pregnancy are among the leading causes of maternal morbidity and mortality as well as adverse perinatal outcomes for the fetus and newborn. Black persons experience higher rates of maternal and infant morbidity and perinatal mortality than other racial and ethnic groups and are at greater risk for developing hypertensive disorders of pregnancy than other pregnant persons.
What are other relevant USPSTF recommendations?	The USPSTF recommends the use of low-dose aspirin (81 mg/d) as preventive medication after 12 weeks of gestation in persons at high risk for preeclampsia (https://www.uspreventiveservicestaskforce.org/uspstf/).
What are additional tools and resources?	• Million Hearts is a national initiative that provides tools and resources for cardiovascular health, including hypertensive disorders of pregnancy (https://millionhearts.hhs.gov/tools-protocols/tools/hypertension-disorders-pregnancy.html) • The National Institute of Child Health and Human Development has information on preeclampsia and eclampsia (https://www.nichd.nih.gov/health/topics/preeclampsia) • The Centers for Disease Control and Prevention has information about high blood pressure during pregnancy (https://www.cdc.gov/bloodpressure/pregnancy.htm) • The Community Preventive Services Task Force recommends exercise programs for pregnant women to reduce the development of gestational hypertension (https://www.thecommunityguide.org/findings/pregnancy-health-exercise-programs-prevent-gestational-hypertension.html)
Where to read the full recommendation statement?	Visit the USPSTF website (https://www.uspreventiveservicestaskforce.org/uspstf/) or the *JAMA* website (https://jamanetwork.com/collections/44068/united-states-preventive-services-task-force) to read the full recommendation statement. This includes more details on the rationale of the recommendation, including benefits and harms; supporting evidence; and recommendations of others.

The USPSTF recognizes that clinical decisions involve more considerations than evidence alone. Clinicians should understand the evidence but individualize decision-making to the specific patient or situation.

USPSTF indicates US preventive Services Task Force.

the methods the USPSTF uses to determine the net benefit, see the USPSTF Procedure Manual.[21]

Practice Considerations

Patient Population Under Consideration

This recommendation applies to all pregnant women and pregnant persons of all genders without a known diagnosis of a hypertensive disorder of pregnancy or chronic hypertension.

Condition Definitions

- Chronic (or preexisting) hypertension is present prior to pregnancy and is typically diagnosed before pregnancy or within the first 20 weeks of gestation.
- Preeclampsia is new-onset hypertension most often occurring after the 20th week of gestation accompanied by either proteinuria or any of the following signs or symptoms: thrombocytopenia, impaired liver function, kidney insufficiency, pulmonary edema, new-onset headache unresponsive to medication, or visual disturbances. The presence of any systemic signs or symptoms of severe hypertension (systolic blood pressure ≥160 mm Hg or diastolic blood pressure ≥110 mm Hg) is indicative of preeclampsia with severe features; HELLP syndrome is a severe form of preeclampsia that is diagnosed based on a constellation of laboratory findings (hemolysis, elevated liver enzyme levels, and low platelet count).
- Eclampsia is new onset of seizures in the absence of other potential causes such as epilepsy.
- Gestational hypertension is new-onset hypertension after the 20th week of gestation in a person with previously normal blood pressure.

Assessment of Risk

Important clinical conditions associated with increased risk for preeclampsia include a history of eclampsia or preeclampsia in a prior

pregnancy, a previous adverse pregnancy outcome, and maternal comorbid conditions (including type 1 or type 2 diabetes prior to pregnancy, gestational diabetes, chronic hypertension, kidney disease, and autoimmune diseases).[1]

Other factors associated with increased risk of preeclampsia and gestational hypertension include nulliparity, high prepregnancy body mass index, family history of preeclampsia, multifetal gestation, and the pregnant individual being 35 years or older.[1,22]

The higher prevalence of hypertensive disorders of pregnancy and the increased risk for severe complications seen in Black persons may be due to their disproportionate burden of social and clinical risk factors. These social and clinical determinants largely result from historical and current manifestations of structural racism that influence environmental exposures, access to health resources, and overall health status.[1,22]

Screening Tests

Blood pressure measurements are routinely used as a screening tool for hypertensive disorders throughout pregnancy and the postpartum period. Accurate blood pressure measurement requires an appropriate technique, a device validated for use in pregnancy, and a cuff of an appropriate size for the patient.[2,23] Blood pressure is measured with a sphygmomanometer by detecting sounds (auscultatory method) or by recording pulsations (oscillometric method).[1,24] A positive screening result for new-onset hypertension during pregnancy is defined as an elevated blood pressure reading (systolic blood pressure ≥140 mm Hg or diastolic blood pressure ≥90 mm Hg in the absence of chronic hypertension) measured twice at least 4 hours apart.[2] A patient with multiple elevated blood pressure readings should have further diagnostic evaluation and clinical monitoring.

Other screening evaluations include testing for proteinuria when preeclampsia is suspected. Previously, the USPSTF found adequate evidence that point-of-care tests for protein in the urine (eg, urine dipstick) had low accuracy for detecting proteinuria in pregnancy.[25] Evidence does not support routine point-of-care urine tests to screen for preeclampsia, because studies suggest that proteinuria alone may not be a good predictor of preeclampsia health outcomes.[25-27] Proteinuria measurement is used in the diagnostic criteria for preeclampsia.[1,2]

Screening Interval

Blood pressure measurements should be obtained during each prenatal care visit throughout pregnancy. Hypertensive disorders of pregnancy can quickly evolve into severe disease that can result in serious, even fatal, maternal and infant health outcomes. The ability to screen for hypertensive disorders of pregnancy using blood pressure measurements is important to identify and effectively treat a potentially unpredictable and fatal condition. While it is known that risk continues into the immediate postpartum period, there is little evidence regarding screening during this period. A pragmatic approach would be for patients to be counseled regarding signs and symptoms of preeclampsia at hospital discharge and for patients with hypertensive disorders to have subsequent blood pressure checks.

Screening for hypertensive disorders of pregnancy alone is not sufficient to improve inequities in health outcomes. Identifying hypertensive disorders of pregnancy requires adequate prenatal visits, surveillance, and evidence-based care in response to evolving patient signs and symptoms during pregnancy and the postpartum period to improve health outcomes.[1] Black and Native American/Alaska Native persons have lower rates of prenatal visits and are at greater risk of serious postpartum morbidity and hospital readmission after delivery.[1,28-31] Screening and monitoring of Black and Hispanic/Latina individuals during the postpartum period could be an important step for reducing health inequities by preventing serious adverse events.[1,31] In addition, screening and monitoring by various health care providers (eg, nurse midwives, nurses, pediatricians, doulas, and lactation consultants) could also help avert serious complications in the postpartum period.[1,32,33]

Treatment

There is no other currently available treatment for preeclampsia except delivery. The timing of delivery depends on gestational age and whether severe features of preeclampsia are present. Management strategies for diagnosed hypertensive disorders of pregnancy include close fetal and maternal monitoring, antihypertension medications, and magnesium sulfate for seizure prophylaxis when indicated.[4,5] Postpartum blood pressure measurement and clinical monitoring of patients diagnosed with hypertensive disorders during pregnancy are also important, since the preeclampsia mortality risks continue after delivery.

One possible way to address the racial and ethnic inequities in the incidence and severity of hypertensive disorders of pregnancy is for health care systems to provide better support during pregnancy for populations at risk, such as Black and Native American/Alaska Native populations.[1] Increasing clinician awareness of populations with an increased risk of hypertensive disorders of pregnancy may help improve equitable dissemination of preventive measures.[1] For example, the USPSTF has recommended that all pregnant Black individuals should be considered for low-dose aspirin use to prevent preeclampsia, with aspirin use recommended for those with at least 1 additional moderate risk factor.[34] Clinicians should also be aware of the risks of poor health outcomes for populations at risk. For instance, Black and Hispanic/Latina persons have a 2 times higher risk of stroke with hypertensive disorders of pregnancy compared with White persons.[1,31] This knowledge could encourage clinicians to focus resources on patients most likely to experience morbidity or mortality.[1]

Race and ethnicity may influence the likelihood of patients receiving recommended treatments.[1,35] To achieve the benefit of screening once a hypertensive disorder of pregnancy is detected, ongoing monitoring and evidence-based management of the condition is needed to reduce the risk of adverse pregnancy outcomes. The use of standardized clinical bundles of best practices for disease management of hypertensive disorders of pregnancy could help ensure that all pregnant persons receive appropriate, equitable care.[1,35-37]

Implementation

Sources of inequity that cause or exacerbate hypertensive disorders of pregnancy and pregnancy outcomes include structural racism and interpersonal racism, which can lead to disparities in access to high-quality health care. Structural and interpersonal racism can also produce disparities in living conditions such as

education level, nutrition, stress level, income, and environmental exposures. These disparities can have profound effects on health status.[1,19] Given the complex factors that contribute to health inequities, approaches to consider in mitigating disparities in hypertensive disorders of pregnancy include

- Connections to community resources in the perinatal period[1]
- Collaborative care provided in medical homes[1]
- Multilevel interventions (eg, individual, community, and health care system or policies, health systems, and clinical practices) to address underlying health inequities that increase health risks in pregnancy (eg, chronic hypertension and type 2 diabetes)[1]
- The use of telehealth and remote monitoring in prenatal and postpartum care[1]

Additional research is needed to evaluate these innovative approaches.

Additional Tools and Resources

Million Hearts is a national initiative that provides tools and resources for cardiovascular health, including hypertensive disorders of pregnancy (https://millionhearts.hhs.gov/tools-protocols/tools/hypertension-disorders-pregnancy.html).

The National Institute of Child Health and Human Development has information on preeclampsia and eclampsia (https://www.nichd.nih.gov/health/topics/preeclampsia).

The Centers for Disease Control and Prevention has information about high blood pressure during pregnancy (https://www.cdc.gov/bloodpressure/pregnancy.htm).

The Community Preventive Services Task Force recommends exercise programs for pregnant women to reduce the development of gestational hypertension (https://www.thecommunityguide.org/findings/pregnancy-health-exercise-programs-prevent-gestational-hypertension.html).

Other Related USPSTF Recommendations

The USPSTF recommends the use of low-dose aspirin (81 mg/d) as preventive medication after 12 weeks of gestation in persons at high risk for preeclampsia.[34] Other related USPSTF recommendations for pregnant persons are available at https://www.uspreventiveservicestaskforce.org/uspstf/.

Update of Previous USPSTF Recommendation

This recommendation is consistent with the 2017 recommendation statement, which recommends screening with blood pressure measurements throughout pregnancy (B recommendation).[25]

Supporting Evidence

Scope of Review

The USPSTF commissioned a systematic evidence review to update and assess the evidence on screening for preeclampsia.[1,38] The approach to the screening and clinical management of preeclampsia and other hypertensive disorders of pregnancy includes similar interventions. Therefore, the USPSTF broadened the scope of the updated review from screening for preeclampsia to screening for hypertensive disorders of pregnancy. Given the foundational evidence base already established on the benefits of screening for elevated blood pressure during pregnancy, this review focused on assessing the comparative effectiveness of different screening approaches that vary by gestational timing, frequency, and modality. The update reviewed the following screening approaches: (1) the use of screening with home blood pressure measurement to supplement or replace office-based blood pressure measurement in prenatal or postpartum care; (2) different prenatal or postpartum screening visit schedules, in terms of the timing and number of blood pressure measurements over the course of pregnancy and beyond; and (3) indicated rather than routine urine screening to detect proteinuria in pregnancy.[1,38] In alignment with the USPSTF's commitment to improve health equity, the evidence review included contextual questions on the drivers behind and approaches to address disparities in health outcomes related to hypertensive disorders of pregnancy. These contextual questions are designed to provide additional information about addressing health inequities in practice and may not reflect the same evidence thresholds as key questions.

Detection or Screening Programs

The USPSTF has previously assessed the accuracy of office, home-based, and ambulatory blood pressure measurements to identify hypertension in adults as adequate.[39] In this update, the USPSTF found evidence related to 3 different screening approaches (ie, home blood pressure measurements, fewer blood pressure measurements for patients at low risk for hypertensive disorders of pregnancy, and indicated rather than routine urine screening for proteinuria). The different screening approaches used in the trials did not reduce or increase the diagnoses of hypertensive disorders of pregnancy.[1,38] A trial (n = 2441) that evaluated home blood pressure measurement as a supplement to routine office-based screening found no statistically significant differences between the intervention and control groups in number of days to detect hypertensive disorders of pregnancy (mean, −1.58 days [95% CI, −8.10 to 4.94 days]), number of hypertensive disorders of pregnancy diagnoses (relative risk [RR], 0.98 [95% CI, 0.81-1.18]), or incidence of severe hypertension (RR, 1.22 [95% CI, 0.87-1.70]).[1,38,40]

Three trials (n = 5203) assessing a reduced prenatal screening visit schedule did not identify differences between groups in the proportion of participants receiving a diagnosis of preeclampsia.[1,38,41-43] In a large UK trial (n = 2794), fewer than 1% of study participants were diagnosed with preeclampsia (RR, 0.85 [95% CI, 0.35-2.04]).[1,38,42] A large US trial (n = 2328) reported similar proportions of preeclampsia cases in the reduced visit intervention group (59/1165 [5.1%]) and the usual care control group (66/1163 [5.7%]) (RR, 0.94 [95% CI, 0.78-1.14]).[1,38,44] Cases of preeclampsia with severe features were also similar in the intervention (10/1165 [0.9%]) and control (9/1163 [0.8%]) groups (RR, 1.05 [95% CI, 0.68-1.62]).[43] A small US randomized clinical trial (RCT) (n = 81) lacked statistical power to estimate group differences.[1,38,43]

A nonrandomized study (n = 2441) compared indicated urine screening with a historical control cohort that received routine screening at every prenatal visit and demonstrated no difference in the proportion of individuals diagnosed with a hypertensive disorder of pregnancy (RR, 1.00 [95% CI, 0.74-1.36]).[1,38,44]

Effectiveness of Early Detection and Treatment

The USPSTF previously found adequate foundational evidence that the well-established management of preeclampsia can reduce maternal and perinatal morbidity and mortality.[25]

Four fair-quality RCTs and 1 fair-quality nonrandomized study of interventions with a historical control were included in the review of screening benefits.[1,38,40-44] Three types of screening approaches were compared with usual care: screening programs that incorporated self-measurement of blood pressure, a reduced prenatal visit schedule for persons at low risk for complications of hypertensive disorders of pregnancy, and protein urine screening only when indicated rather than at every prenatal visit. None of the trials reported statistically significant differences across various serious health outcomes (eg, eclampsia, transient ischemic attack, stroke, HELLP syndrome, pulmonary edema, maternal and perinatal mortality, stillbirth, or intrauterine growth restriction/small for gestational size [IUGR/SGA]), but the effect estimates were imprecise due to inadequate statistical power.[1,38] Overall, the USPSTF found limited evidence on benefits associated with alternative approaches to screening for hypertensive disorders of pregnancy.

Home Blood Pressure Measurement

One UK RCT, the Blood Pressure Monitoring in High Risk Pregnancy to Improve the Detection and Monitoring of Hypertension 1 (BUMP 1) trial (n = 2441), assessed the addition of home blood pressure measurement to measurement during prenatal visits in participants at increased risk of a hypertensive disorder of pregnancy based on common clinical risk factors (eg, nulliparity, age, family history, previous preeclampsia, body mass index >30 kg/m^2, twin pregnancy, or diabetes).[40] The trial evaluated home blood pressure measurement 3 times a week to supplement routine prenatal care among pregnant persons recruited at 16 to 24 weeks of gestation. The BUMP 1 trial was composed mostly of White (British, Irish, or other) participants (74%); it included smaller percentages of participants identifying as Asian or Asian British (10%), Black or Black British (8%), or "other" or "mixed" race or ethnicity (7%).[1,38,40] The home blood pressure measurement study found no significant differences in risk of IUGR/SGA between the intervention and control groups (RR, 1.15 [95% CI, 0.87-1.53]). Fewer than 2% of study participants experienced serious complications from hypertensive disorders of pregnancy. The difference between groups was not statistically significant (RR, 0.79 [95% CI, 0.40-1.55]) for maternal complications related to hypertensive disorders of pregnancy.[1,38,40]

Reduced Prenatal Screening Visit Schedule

Three RCTs (n = 5203) in the UK and US evaluated a reduced prenatal visit schedule for pregnant persons considered to be at low risk for pregnancy complications. One trial assessed pregnancy risk and study eligibility in the first trimester and the other 2 trials included eligible individuals entering prenatal care by week 24 and week 26 of gestation.[1,38,41-43] The trials evaluated the effects of a reduced prenatal care schedule (6-9 visits) compared with a standard visit schedule (13-14 visits). The study population in the large US trial (n = 2328) of a reduced prenatal visit schedule was described as predominantly White (81%) and Hispanic (12%) individuals.[1,38,41] One-third of study participants (32%) were described as an "ethnic minority" in the large UK trial (n = 2794).[1,38,42] The small US-based RCT (n = 81) included primarily Hispanic (74%) and White (22%) study participants.[1,38,43]

Few cases of perinatal mortality were reported in the reduced visit intervention and routine visit control groups in the 2 large trials. Estimates of perinatal mortality were not statistically significant in the large US trial (RR, 1.00 [95% CI, 0.54-1.86]) or in the large UK trial (RR, 0.72 [95% CI, 0.27-1.88]).[1,38,41,42] Estimates of preterm delivery (<37 weeks of gestation) were not statistically significant in the 2 US trials (RR, 1.08 [96% CI, 0.92-1.27] and RR, 2.21 [96% CI, 0.45-10.70]).[1,38,41,43] In the large US trial, the risk of IUGR/SGA (<10th percentile) was not statistically different between study groups (RR, 1.13 [95% CI, 0.91-1.41]).[1,38,41] The large UK trial also reported IUGR/SGA, with no statistically significant difference (RR, 0.94 [95% CI, 0.82-1.09]) observed between intervention and control groups.[1,38,42] The risk for low birth weight (<2500 g) was reported in the large US trial and was similar between groups (RR, 0.94 [95% CI, 0.78-1.12]).[1,38,41] Other rare infant health outcomes were reported in the small US trial.[1,38,43] Placental abruption was reported in the large US trial, but the risk was not statistically significant (RR, 1.21 [95% CI, 0.90-1.64]).[1,38,41] The risk of postpartum hemorrhage was similar in the large UK and US trials (RR, 1.01 [95% CI, 0.80-1.26] and RR, 0.94 [95% CI, 0.59-1.50], respectively).[1,38,41,42]

Indicated Rather Than Routine Urine Screening for Proteinuria

One fair-quality nonrandomized study (n = 2441) conducted in the US measured the effects of indicated (vs routine) urine screening in prenatal care.[44] Pregnant individuals receiving prenatal care before and after implementation of a change in clinical practice were compared. In a historical comparison group, prenatal care included routine urine screening at every visit, and in the intervention period, urine tests were conducted at the first prenatal visit and at subsequent visits for a range of indications (eg, urinary tract infection symptoms, severe vomiting or weight loss, or elevated blood pressure).[44] The study population identified as Black (9%), Hispanic (75%), White (19%), or "other" (6%), and the study was conducted in a setting with risks related to social determinants of health (eg, majority public insurance or uninsured or lower income). Indicated urine screening was associated with reduced risk of preterm delivery (4.9%) compared with more frequent routine urine screening (7.7%) (RR, 0.64 [95% CI, 0.45-0.90]).[1,38,44] The study was limited by potential confounding related to the design, and more research would be needed to confirm this result.

Potential Harms of Screening and Treatment

Previous evidence reviews commissioned by the USPSTF found good-quality evidence that measuring blood pressure has few major harms in adults.[41] In the current review, there was limited evidence that the screening approaches for hypertensive disorders of pregnancy resulted in serious or significant harms.

Five fair-quality RCTs and 1 fair-quality nonrandomized study of interventions with a historical control were included in the evaluation of harms.[1,38,40-45] An additional home blood pressure measurement screening trial (n = 80), conducted in the UK, enrolled study participants at low risk for hypertensive disorders of pregnancy between 24 and 28 weeks of gestation. The intervention group had a reduced number of prenatal visits during the second half of pregnancy plus weekly home blood pressure screening compared with a usual care control group.[1,38,45]

Two home blood pressure measurement screening studies (n = 2521) assessed harms.[1,38,40,45] One trial found no significant

difference in the rates of induction of labor and cesarean delivery for hypertension-related complications (RR, 1.09 [95% CI, 0.82-1.44]) or in the rates of emergency cesarean delivery (RR, 0.89 [95% CI, 0.76-1.03]) between the intervention and control groups.[1,38,40] The 2 trials reported no difference in anxiety during pregnancy or the postpartum period between the intervention and control groups.[1,38,40,45] The 3 trials (n = 5203) of a reduced prenatal care visit schedule found no difference in the rates of anxiety or postnatal depression between the intervention and control groups; only 1 trial measured postnatal depression and reported no difference between groups.[1] Two of the larger trials reported similar levels of cesarean delivery or induction of labor for any reason and for reasons related to hypertension or fetal distress.[1,38,41,42] Relative risks for all these outcomes were close to or less than 1, with no statistically significant differences observed.[1,38,41,42] The third small trial reported few cases of cesarean deliveries.[1,38,43] In the nonrandomized study (n = 2441) comparing indicated urine testing with a historical control of routine urine screening, the intervention was not associated with cesarean delivery risk (RR, 0.96 [95% CI, 0.79-1.16]).[1,38,44]

The potential harms of treatment for preeclampsia and other hypertensive disorders of pregnancy are well established and include indicated preterm delivery and associated infant health complications, cesarean delivery, neonatal complications, and adverse effects from magnesium sulfate (eg, nausea, headache, blurry vision, and floppy infant/hypotonia) and antihypertension medications (eg, fatigue, headache, and nausea).[46]

Response to Public Comment

A draft version of this recommendation statement was posted for public comment on the USPSTF website from February 7, 2023, to March 6, 2023. In response to comments, the USPSTF clarified its definition of hypertensive disorders of pregnancy. The USPSTF incorporated language in the Practice Considerations section regarding postpartum blood pressure monitoring and appropriate cuff sizes. The USPSTF also listed resources to help clinicians in the Additional Tools and Resources section.

Research Needs and Gaps

The USPSTF has identified several research gaps of importance. Research is needed:

- On the best approaches for blood pressure monitoring to detect and strategies to prevent the development of superimposed preeclampsia in pregnant persons with chronic hypertension
- On the best approaches to detecting and mitigating the consequences of hypertensive disorders of pregnancy that develop during the postpartum period
- To address health inequities through the evaluation of multilevel interventions (eg, policies, health systems, and clinical practices) for Black and Native American/Alaska Native populations, who experience increased morbidity and mortality from hypertensive disorders of pregnancy
- To evaluate the clinical value of risk-stratified approaches to screening
- To evaluate the use of telehealth and remote blood pressure measurement during pregnancy and the postpartum period to increase access to care
- To further clarify the value and role of proteinuria assessment in prenatal care
- To evaluate differences in timing of screening early vs late during pregnancy and the postpartum period to decrease adverse outcomes
- On barriers to health care before and during pregnancy, important for increasing the proportion of persons entering pregnancy with previously diagnosed and controlled hypertension, baseline blood pressure measurements, preeclampsia risk assessment, and low-dose aspirin prophylaxis, if indicated, initiated at the recommended gestational age
- To mitigate cardiovascular complications later in life in patients diagnosed with hypertensive disorders of pregnancy

Recommendations of Others

The American College of Obstetricians and Gynecologists recommends obtaining routine blood pressure measurements, a detailed medical history, and a baseline screening for urine protein content to assess kidney status.[47] It also recommends blood pressure evaluation for women with a diagnosed hypertensive disorder of pregnancy no later than 7 to 10 days postpartum; women with severe hypertension should be seen within 72 hours.[48] The Society of Obstetricians and Gynaecologists of Canada recommends that the diagnosis of hypertension be based on office or in-hospital blood pressure measurements and that all pregnant women should be assessed for proteinuria. It does not recommend screening with biomarkers or Doppler ultrasonography.[49] The UK National Institute for Health and Care Excellence recommends screening for preeclampsia by obtaining blood pressure measurements and urinalysis for proteinuria at each antenatal visit.[50]

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