Boston Medical Center Maternity Care Guideline
Guideline: Hypertension in pregnancy
Accepted: Date 8/23/17
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Introduction

Hypertension in pregnancy may be classified as chronic hypertension, gestational hypertension preeclampsia-eclampsia, or chronic hypertension with superimposed preeclampsia.

This guideline is meant to provide a reference for outpatient diagnosis and management of hypertensive disorders in pregnancy. Each prenatal care provider should use their best clinical judgment in conjunction with conversation with the patient and her family to make a plan for management and treatment.

It is not in the scope of this guideline to review all of the criteria and recommendations of the ACOG task force document which may be accessed through the link: http://www.acog.org/Resources-And-Publications/Task-Force-and-Work-Group-Reports/Hypertension-in-Pregnancy

Diagnosis

Chronic hypertension:

- Blood pressure with elevation of either systolic ≥ 140 or diastolic ≥ 90 preceding the pregnancy or present prior to 20 weeks gestation.

Gestational hypertension:

- Two elevated blood pressures, at least 4 hours apart, systolic ≥ 140 or diastolic ≥ 90 after 20 weeks gestation without proteinuria or severe features of pre-eclampsia

Preeclampsia without severe features:

- Two elevated blood pressures, at least 4 hours apart, systolic ≥ 140 or diastolic ≥ 90 after 20 weeks gestation with one or more of the following:
    - Proteinuria:
        - Urine protein/creatinine ratio of ≥ 0.3 from a clean catch*

OR

        - 24hr urine protein of ≥ 300 mg

OR

        - urine dipstick reading of ≥ +1 (>30mg/dL) protein (if above methods are not available)

*This is an acceptable method of diagnosing preeclampsia and does *not* require follow up with a 24hr urine protein for confirmation

Preeclampsia with severe features:

- Two elevated blood pressures, at least 4 hours apart, systolic ≥ 160 or diastolic ≥ 110 after 20 weeks gestation or,
- Mildly elevated BP 140-159/90-109 with any of the following:

    - Platelet count ≤ 100,000/microliter
    - Renal insufficiency: Serum creatinine > 1.1 or doubling of serum creatinine in absence of other renal disease
    - Impaired liver functions: liver transaminases over twice normal values
    - Pulmonary edema
    - Cerebral or visual symptoms

Prevention

Prevention of Preeclampsia and Adverse Outcomes

- Based on data from the U.S. Preventative Health Service Task Force, low dose (prenatal) Aspirin (81mg) initiated daily in the evenings between 12 -28 weeks (ideally 12-16 weeks), continued until delivery, has been shown to provide risk reduction for pre-eclampsia, preterm birth and fetal growth restriction.
- There have been few to no risks of starting ASA in pregnancy
    - May increase mild GI Upset
- Please refer to the following table for recommendations on who should receive prenatal aspirin

Table. Clinical Risk Assessment for Preeclampsia*

Risk Level	Risk Factors	Recommendation
High†	History of preeclampsia, especially when accompanied by an adverse outcome Multifetal gestation Chronic hypertension Type 1 or 2 diabetes Renal disease Autoimmune disease (systemic lupus erythematous, antiphospholipid syndrome)	Recommend low-dose aspirin if the patient has ≥1 of these high-risk factors
Moderate‡	Nulliparity Obesity (body mass index >30 kg/m^2) Family history of preeclampsia (mother or sister) Sociodemographic characteristics (African American race, low socioeconomic status) Age ≥35 years Personal history factors (e.g., low birthweight or small for gestational age, previous adverse pregnancy outcome, >10-year pregnancy interval)	Consider low-dose aspirin if the patient has several of these moderate-risk factors§
Low	Previous uncomplicated full-term delivery	Do not recommend low-dose aspirin

*USPFTF, (2014).

Treatment/Management of Hypertension in Pregnancy

Consult with BMC MFM is recommended for all patients with chronic hypertension on or off medications, chronic hypertension without evaluation, and new onset hypertension in pregnancy prior to 20 weeks. Further care site and management may be determined by the patient, her care provider and the MFM physician.

Chronic HTN on Medication

- If on ACE Inhibitors – Discontinue in pregnancy and consider new medication in consultation with MFM or OBGYN
- If on other antihypertensive medications, consider change in medication to labetalol with an MFM or OBGYN consult

Gestational HTN or Preeclampsia treatment

- Hospital evaluation recommended to develop treatment plan

Recommendations for new diagnosis of hypertension in pregnancy:

If BP is elevated for the first time during a clinical visit:

- **If Blood Pressure is Mild Range (140-159/90-109) once**
  - Assess that blood pressure was taken accurately (see Appendix 1)
  - Assess patient for severe features (headache, visual changes, RUQ pain)
  - Assess for urine protein via urine dip, protein/creatinine ratio or 24 hour urine
    - Protein/creatinine ratio is sufficient for diagnosis, there is no need to confirm with a 24hr urine
  - Assess for end organ damage and signs of severe pre-eclampsia by drawing the following labs
    - CBC
    - ALT/AST
    - BUN/Creatinine
  - Educate patient regarding symptoms of pre-eclampsia
  - If repeat BP reading in 15-30 minutes is **normal** and labs are normal, arrange for twice weekly BP checks
  - If repeat BP is still elevated after 30 minutes, send to triage (see below)
  - If BP normal and labs result *abnormal* send to triage for repeat BP, fetal monitoring, and evaluation of labs
- **When to Send Patient to Triage:**
  - Any provider concern for maternal or fetal well being
  - If repeat BP is > 140/90 in 15-30 minutes
  - BP is severe range >160/110 regardless of labs or repeat BP
    - Send to triage for fetal assessment, labs, and possible antihypertensive administration
    - Consider EMS for hospital transfer
  - If she has any symptoms of pre-eclampsia with severe features
  - Epigastric pain, severe headache, or any visual changes

    - Any abnormal labs (ALT/AST, Platelets, Bun/Creatinine), proteinuria as defined above
    - If the clinic/provider does not have the ability to check labs and follow up appropriately (ie: within 24 hrs)
- Recommendations for ongoing management and treatment of gestational HTN/preeclampsia
    - Care plan will be provided at time of hospital discharge
    - MFM, OBGYN, or OB attending consult recommended if change in patient status
    - With onset of severe features or a severe range blood pressure of systolic ≥ 160 or diastolic ≥ 110, plan for triage evaluation

Fetal Monitoring in ATU

Indication	Ultrasound Type	EGA start	Frequency	NST or BPP1	EGA Start	Frequency
Hypertension (chronic)	EFW	24	Monthly	Yes	32	Weekly

Fetal Monitoring Frequency with Preeclampsia
-Plan to be established with MFM consultation

Indication	Ultrasound Type	EGA start	Frequency	NST or BPP1	EGA Start	Frequency
Preeclampsia or	EFW	At dx	3-4 weeks	Yes	At dx	Twice weekly(NST/BPP)
Gestational hypertension without severe features	EFW	At dx	3-4 weeks	Yes	At dx	Twice weekly (NST/BPP)

Timing of Delivery

- Chronic Hypertension: Schedule Induction between 37-39 weeks gestational age
- Gestational Hypertension and Preeclampsia at term: Schedule IOL at 37 weeks or at time of diagnosis (if diagnosis is > 37 weeks gestational age)
- Preeclampsia ≤37 weeks gestational age: Consult with MFM service re management and delivery timing
- Preeclampsia with severe features or severe range blood pressure at any gestational age: hospital management

Pt counseling re IOL: While IOL at 37 weeks is reasonable, shared decision making with patients is essential when planning IOL. Review risks of maternal morbidity and worsening hypertension with expectant management as well as potential neonatal morbidity of early term birth of fetus. Cluver et al., 2017.

Post-Discharge Management of Hypertensive Patients: Antepartum

Some patients are admitted until delivery when the diagnosis of gestational hypertension or preeclampsia is made. If a patient is discharged with one of these diagnoses, a care plan will be provided.

Management of Hypertensive Patients Postpartum

- Patients should have blood pressure checked within 3 days of delivery. This may be done while still inpatient, via VNA, or at clinic with an RN or provider visit.
- Patients should be scheduled for a BP check at 1 week postpartum with an RN or provider at their clinic.
- A care plan will be included in the patient's discharge note. *Please see discharge summary for management plan and for parameters regarding when to send patient back to labor and delivery triage.*

Unless otherwise specified the following parameters should be used for initial BP check visit:

- If BP is <150/100 continue current management
- If BP is > or = 150/100 case should be discussed with attending MD regarding management, and sent to triage if no attending is available
- Patient should be asked about signs and symptoms of pre-eclampsia (headache, visual changes, epigastric pain, facial swelling), ensure she is taking her medications as prescribed

Ongoing care of the patient with Gestational Hypertension or Preeclampsia

- Flag patient's PCP for follow up

Stopping Postpartum Hypertensive Medications

Please consult the appropriate outpatient obstetric or family medicine MDs, or call the MFM on call regarding weaning and stopping antihypertensive medications at a two week postpartum visit

Logistical Practice for BMC and CHC providers

<u>Communication Guidelines with BMC L&D, Triage</u>:

Patient evaluation: Page **0008** and **write** "(clinic, provider) sending patient (Name, MRN or DOB) for evaluation, for (reason)"
A call is not necessary.

Patient admission: Page **0008** and **write** "(clinic/provider) sending patient (Name, MRN or DOB) for admit for (reason)"
Please **also** call **617-414-9701** to alert the charge nurse

Scheduling Inductions:

- Call 617 414 4364 and schedule Induction with the Unit Secretary. Please provide the patient's BMC MRN or Name and Date of Birth, EDD, and indication for induction.

<u>Arranging fetal testing</u>:

- Place ATU referral at outside health centers for urgent appointment and call the call center (617) 414 2000. If there is no appointment available within the week, page ATU director (pager 3771)

    - If within BMC, send message to ATU Pool (P BMC OBGYN ATU) to update diagnosis and alert them of need for testing
    - Use outside messages when available between BMC and CHCs
        - Codman OB/GYN
        - EBNHC OBGYN Department

Patient Education/Patient Education Materials

High Blood Pressure or Preeclampsia in Pregnancy, prenatal care **(see appendix II)**
This can be added to the patient AVS for education on hypertension and preeclampsia in pregnancy.

References

American College of Obstetricians and Gynecologists. Task Force on Hypertension in Pregnancy. (2013). Hypertension in pregnancy. http://www.acog.org/Resources-And-Publications/Task-Force-and-Work-Group-Reports/Hypertension-in-Pregnancy

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U.S. Preventive Services Task Force. Low-Dose aspirin use for the prevention of morbidity and mortality from preeclampsia: Recommendation Statement. *Am Fam Physician*. 2015 Mar 1:91(5):online. http://www.aafp.org/afp/2015/0301/od1.html

ACOG. (2016). Practice Advisory on low-dose aspirin and prevention of preeclampsia: Updated recommendations. http://www.acog.org/About-ACOG/News-Room/Practice-Advisories/Practice-Advisory-Low-Dose-Aspirin-and-Prevention-of-Preeclampsia-Updated-Recommendations

USPFTF. (2014). Low-dose aspirin use for the prevention of morbidity and mortality from preeclampsia: Preventative Medication. : https://www.uspreventiveservicestaskforce.org/Page/Document/UpdateSummaryFinal/low-dose-aspirin-use-for-the-prevention-of-morbidity-and-mortality-from-preeclampsia-preventive-medication

Appendix I

How to take a BP

Diagnosis of hypertensive disorders in pregnancy changes prenatal management and birth plans. Please ensure that BP readings are accurate by ensuring the following guidelines are met: Also, please feel free to use the attached educational material. :_____

1a. Use validated equivalent automated equipment. 1b. Check cuff for any defaults, ensure bladder is empty, no leaks
2a Obtain correct size cuff: width of bladder 40% of circumference and encircle 80% of arm: • Adult Cuff Range: 27-35 cm • Large Cuff Range: 34-42 cm • Extra Large Cuff Range: 43cm or greater Note- Accurate blood pressure measurements in obese women can be quite challenging and it is extremely important to use an appropriate sized cuff. In women with an upper-arm circumference of more than 34cm, large adult cuffs or thigh cuffs can be used to improve blood pressure accuracy. For upper-arm measurements greater than 50cm, the American Heart Association recommends using a cuff on the forearm and feeling for the appearance of the radial pulse at the wrist to estimate systolic blood pressure. However, the accuracy of forearm measurement is not reliable.
3a. Use a **sitting or semi-reclining position** with back supported and the patient's arm at heart level 3b. Patient to sit quietly for **5 minutes** prior to measurement 3c. Ensure bare upper arm, no restrictive clothing 3d. Patient's feet should be **flat**, not dangling from bed, and legs uncrossed e. Assess any recent (within previous **30 minutes**) consumption of caffeine or nicotine. If blood pressures are at the level that requires treatment, consumption of nicotine or caffeine should not lead to delays in instituting appropriate anti-hypertensive therapies

4a. Support patients arm at heart level, seated in **semi-fowlers position** 4b. Instruct the patient not to talk 4c. For auscultatory measurement: use first audible sound (Kortokoff I) as systolic pressure and use disappearance of sound (Kortokoff V) as diastolic pressure 4d. Read to the **nearest 2 mm Hg** 4g. If greater than or equal to 140/90, repeat within 15 minutes and if still elevated, further evaluation for preeclampsia is warranted. **Do not reposition patient to either side to obtain a lower BP. This will give you a false reading.**
5.Enter correctly performed measurement into patient chart

Appendix II
High Blood Pressure or Preeclampsia in Pregnancy, prenatal care **(see appendix II)**
.bmcobprenataleduHTN
This can be added to the patient AVS for education on hypertension and preeclampsia in pregnancy.

High Blood pressure or Preeclampsia in Pregnancy
Hypertension, or high blood pressure, is when there is extra pressure inside your blood vessels that carry blood from the heart to the rest of your body (*arteries*). It can happen at any time in life, including pregnancy. Hypertension during pregnancy can cause problems for you and your baby. Your baby might not weigh as much as he or she should at birth or might be born early (*premature*). Very bad cases of hypertension during pregnancy can be life-threatening.

Different types of hypertension can occur during pregnancy. These include:

- Chronic hypertension. This happens when a woman has hypertension before pregnancy and it continues during pregnancy.
- Gestational hypertension. This is when hypertension develops during pregnancy.
- Preeclampsia or toxemia of pregnancy. This is a very serious type of hypertension that develops only during pregnancy. It affects the whole body and can be very dangerous for both mother and baby.

Signs of High Blood Pressure in pregnancy or after the baby is born are

- Strong headache that doesn't go away if you take Tylenol
- Changes in your vision like seeing flashes of light or dark spots
- Having pain under your right rib
- New nausea and vomiting
- Rapid weight gain

If you have any signs of high blood pressure or preeclampsia in pregnancy call your provider or Boston Medical Center labor and delivery at 617-414-4364.

Risk Factors
There are certain factors that make it more likely for you to develop hypertension during pregnancy. These include:

- Having hypertension before pregnancy.
- Having hypertension during a previous pregnancy.
- Being overweight.
- Being older than 40 years.
- Being pregnant with more than one baby
- Having diabetes or kidney problems.

What if I have high blood pressure or preeclampsia in pregnancy?

- Your doctor or midwife will talk to you about a plan
- If you are at least 37 weeks pregnant or if your baby is not doing well your doctor or midwife will recommend an induction of labor
- You may also need to have more frequent ultrasounds and monitoring of your baby's heartbeat
- If you are before 37 weeks and you have preeclampsia you will need to go to the hospital

Gestational hypertension and preeclampsia usually go away after your baby is born. Your blood pressure will likely stabilize within 6 weeks. Women who have hypertension during pregnancy have a greater chance of developing hypertension later in life or with future pregnancies.

Future pregnancies

- It is important to tell your provider that you had high blood pressure during your pregnancy if you decide to have another baby.
- Sometimes, an early delivery is needed if you had high blood pressure in another pregnancy. This may be the case if the condition worsens. It would be done to protect you and your baby. The only cure for preeclampsia is delivery.
- Your health care provider may recommend that you take one low-dose aspirin (81 mg) each day to help prevent high blood pressure during your next pregnancy if you are at risk for preeclampsia.

Appendix III

High Blood Pressure or Preeclampsia in Pregnancy, postpartum discharge summaries and visiting nurses plan recommendations

.bmcobcomplicationshtn (patient education)

PREGNANCY COMPLICATION: High Blood Pressure
You had *** during your pregnancy. You were discharged home with a plan to ***.
A visiting nurse will visit you at home if your insurance covers it to check your high blood pressure. You will have a visit at your clinic in a week to have your blood pressure checked. If you have any signs of high blood pressure or preeclampsia like headaches, changes in your vision like seeing flashes of light or dark spots, or pain in your abdomen especially under your right rib please contact us right away at 617-414-4364.

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- Your health care provider will recommend that you take one low-dose aspirin (81 mg) each day to help prevent high blood pressure during your next pregnancy if you are at risk for preeclampsia.

Recommendations for visiting nurses provided in discharge summary
.bmcobvnahtn (discharge summary)

VNA is recommended for: BP checks 3 x week for up to 4 weeks**.** VNA to please call BMC labor and delivery at 617-414-4364 and ask for a physician to report systolic BP's greater than 150 and diastolic BP's greater than 100. Also call for signs and symptoms of pre-eclampsia including headache not relieved by pain medication, visual changes, or right upper quadrant or epigastric pain.

In-patient OB Case Manager to process request and meet with patient before discharge. The patient agrees to VNA if covered by insurance.
Patient will be scheduled within 1 week in prenatal clinic for blood pressure assessment by RN or provider.

Patient to continue on antihypertensive medications if they were prescribed while in patient. VNA please confirm that patient is taking medications as directed.

Primary maternity care provider information:

Dr. ***
Clinic: ***
Telephone: ***