Perinatal Region IV
Provider Support Network

Outpatient Hypertension Management

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UNC SCHOOL OF MEDICINE
Pediatrics, Obstetrics and Gynecology
Collaborative for Maternal and Infant Health

MomBaby.org

Hypertensive disorders of pregnancy constitute one of the leading causes of maternal and perinatal mortality worldwide.[1] It is estimated that 10% or more of pregnant patients will be affected by hypertension or a hypertensive disorder. Hypertension is one of the most common treatable risk factors for stroke, myocardial infarction and kidney disease.[2] Care and effective management of hypertension in pregnancy is imperative to supporting health across the life course.

"Standardization of health care processes and reduced variation has been shown to improve outcomes and quality of care"[3] Although leading organizations have focused on standardizing management and care of hypertension in the hospital setting, there is little information available to support practice and management of hypertension in pregnancy in the ambulatory setting. The 'Outpatient Severe Hypertension Bundle' is an adapted version of the Alliance for Innovation on Maternal Health (AIM) American College of Obstetricians and Gynecologists (ACOG) "Severe Hypertension in Pregnancy and Postpartum Bundle". More information on the AIM ACOG bundle can be found here: https://saferbirth.org/psbs/severe-hypertension-in-pregnancy.

This outpatient bundle is designed to provide guidance for every clinic, every patient, and every case of severe hypertension and offer resources and tools to support the outpatient health care team.

Please go to https://www.mombaby.org/outpatient-bundle-for-severe-hypertension to view list of references.

⚠ The goal of equity in care and outcomes can be accomplished only if it is treated the same as the goal of other quality improvement initiatives – namely, as a desired end in and of itself, embedded within a culture of safety that is specifically acknowledged, discussed, measured, monitored, and the subject of continuous quality improvement efforts.

⚠ According to the CDC, about 700 women die each year in the United States from complications due to pregnancy.[4] Of these deaths, almost two thirds are preventable. American Indian, Alaska Native and Black women are two to three times more likely to die from pregnancy-related causes than white women. Standards in management and care that are applied to each and every patient will assist in the delivery of equitable care.

Creating Standard Protocols

Standard protocols for management and treatment of severe hypertension are important for the outpatient setting. Access to protocols to identify early warning signs, diagnostic criteria and monitoring for preeclampsia will provide every clinic with the tools needed to provide optimal care. Having a protocol in place for notification and management will help to ensure timely management. Here are some points to include:

- Notification of provider if systolic BP ≥ 160 and/or diastolic BP ≥ 110 (severe range) and retake within 15 minutes
- Escalation and care transition
- Maternal transport (algorithm) [Clinic Specific]
- If systolic BP ≥ 140 and/or diastolic BP ≥ 90 further evaluation for pre-eclampsia needed (Follow clinic protocols)

Assessment starts when patients call into the clinic for an appointment. Providing a script and flow to support timely management of hypertension is imperative.

Front Desk/Clinic Call Center Triage Flow Chart for Pregnant/Postpartum Patients with Possible Severe Hypertensive Emergency

Are you pregnant or have you been pregnant within the past year?

No

Follow usual clinic protocol

Yes

Is patient having any of the following?:

Home BP reading of greater or equal to 160/110?

Severe headache that doesn't go away with Tylenol?

Shortness of breath/ trouble breathing?

Changes in vision?

Severe upper belly pain?

Bright red bleeding?

No

Clinic choice:

Front desk staff page OB Provider/triage nurse

Go to nearest L&D, OB ED

Call 911

Maternal complications of severe range blood pressures leading to pre-eclampsia with severe features:

- Pulmonary edema
- Myocardial infarction
- Stroke
- Coagulopathy
- Renal failure
- Retinal injury
- Acute respiratory distress syndrome

Assessing Blood Pressure

Accuracy

Obtaining accurate blood pressure measurements is key to proper treatment and management. Ensure that all team members are comfortable with taking accurate blood pressure readings. Each clinic should create a protocol to train clinical staff on how to take blood pressure on a regular basis.

STEP 1 **Prepare Equipment**	a. Manual blood pressure cuff is gold standard. Validated automated equipment acceptable. b. Check cuff for any defaults. c. Obtain correct size BP cuff: width of bladder 40% of circumference and encircle 80% of arm. d. Apply the BP cuff so the index line fits within the two range lines.
STEP 2 **Prepare the Patient**	a. Patient to sit with the back supported and arm at heart level. b. Patient to sit quietly for 5 minutes prior to measurement. c. Bare upper arm of any restrictive clothing. d. Patient's feet to be flat, not dangling from examination table or bed, and legs not crossed. e. Ask patient not to talk during measurement. f. Assess for any recent (within the previous 30 minutes) consumption of caffeine or nicotine.
STEP 3 **Take Measurement**	g. For auscultatory measurement: use first audible sound (Kortokoff I) as systolic pressure and use disappearance of sound (Kortokoff V) as diastolic pressure. Read to nearest 2 mm Hg. h. If $\geq$ 140/90, repeat within 15 minutes and if still elevated, notify provider as further evaluation for pre-eclampsia is warranted. i. If $\geq$ 160/110, repeat within 15 minutes and if remains $\geq$ 160/110 notify provider and follow algorithm.

This table was adapted from the Improving Health Care Response to Preeclampsia: A California Quality Improvement Toolkit, funded by the California Department of Public Health, 2014; supported by Title V funds.

Treatment

Timely treatment of severe hypertension can prevent congestive heart failure, prevent myocardial ischemia, renal injury or failure, ischemic or hemorrhagic stroke. Antihypertensive treatment should be initiated for acute-onset severe hypertension. If your clinic has access to antihypertensives, medication should be administered within 30-60 minutes of initial severe range BP.

Treatment of Severe Range Blood Pressure: The Pregnant Patient

Intake BP severe range: ≥ 160/110
Ensure proper cuff size and patient positioning; retake within 15 minutes

Evaluate for S&S of preeclampsia / HELLP:
• CNS symptoms: HA, vision changes? • GI symptoms: N/V/upper abdominal pain? • Abnormal physical exam?

Yes

Send to L&D Triage or OB/ED for further evaluation

15 minutes later: BP ≥ 160/110?

Yes

1) Administer oral Nifedipine IR 10mg
2) Call transferring facility if applicable
3) If HA, vision changes, N/V/ upper abdominal pain, abnormal FHTs – call ambulance
4) If asymptomatic, proceed to emergency room/ L&D immediately

No

If less than 37 weeks and more than 20 weeks:

Consider hospital admission/possible referral to higher level care for further monitoring and evaluation.

If greater than 37 weeks and BP ≥ 140/90:

Send to L&D triage or OB/ED for further evaluation and delivery planning.

Immediate-Release Oral Nifedipine

If two severe BPs (SBP ≥ 160 or DBP ≥ 110) persist for 15 mins or more or if 2 severe bps are obtained within 15 minutes treat with immediate-release oral nifedipine.

ACOG algorithm available at this link, revised Feb 2020.

Immediate-Release Oral Nifedipine 10mg

Repeat BP in 20 minutes and arrange transfer to higher level care. If SBP ≥ 160 or DBP ≥ 110 and awaiting transfer, administer 20 mg oral nifedipine

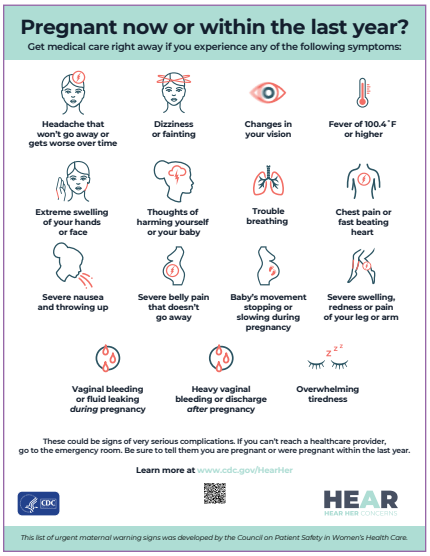
If still awaiting transfer after 20 mins, repeat BP is SBP ≥ 160 or DBP ≥ 110 administer 2nd dose of 20mg oral nifedipine 20mg.

⚠ **Caution: Immediate-release oral nifedipine has been associated with an increase in maternal heart rate and may overshoot hypotension. Providers may observe reflex tachycardia and headache.**

Patient Education

Educational materials on hypertension in pregnancy should be available to all patients. Printed educational resources and materials should be appropriate for the patient's health literacy, cultural needs and language proficiency. Implement standard protocols to ensure patients, families, and members of their support system receive accurate and reliable education on early warning signs of severe hypertension and how to get help.

Urgent Maternal Health Warning Signs is a campaign one-pager that visually represents the 15 urgent maternal warning signs developed by the Council on Patient Safety in Women's Health Care is now available. Visit https://newmomhealth.com/hear-her for more information.



CDC's HEAR HER Campaign seeks to raise awareness of potentially life-threatening warning signs during and after pregnancy and improve communication between patients and their healthcare providers. The North Carolina Maternal Health Innovation team is proud to partner with the HEAR HER Campaign and adapt campaign materials to support awareness for expecting and new parents, supporters, and care teams in North Carolina.

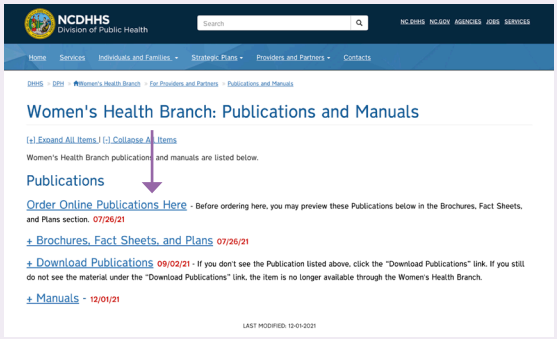
Created by the Centers for Disease Control and Prevention

Patient Resources

To order materials:

» Go to tinyurl.com/WHBform

» Click "Order Online Publications"



» **Birth Control After Baby:** Available in both English and Spanish from the Women's Health Branch. View PDFs here under the new parent materials section.

» **Taking Care of You:** Available in both English and Spanish from: https://newmomhealth.com

» **YQ2Q: Tobacco Cessation** https://youquittwoquit.org

Postpartum Evaluation

Protocols should be in place to monitor and care for patients. Innovative follow-up appointments integrate unique methods of engaging with patients and their support systems to facilitate a smooth care transition. Appointments might include telehealth support, connection with doula services, case managers or referrals to other supporting services.

Educating all members of the patient provider-provider support team is essential. Healthcare providers that don't traditionally care for pregnant or postpartum patients can benefit from learning from examples such as the protocol below.

Patient has Elevated BP at Home, Office, Triage

Postpartum Triggers to Consider

- SBP ≥ 160 or DBP ≥ 110 or
- SBP ≥ 140-159 or DBP ≥ 90-109 with unremitting headaches, visual disturbances, or epigastric/RUQ pain

- Emergency department treatment (OB/MICU consult as needed)
- AntiHTN therapy suggested if persistent SBP ≥ 150 or DBP ≥ 100 on at least two occasions at least 4 hours apart
- Persistent SBP ≥ 160 or DBP ≥110 should be treated within 1 hour

Good response to antiHTN treatment and asymptomatic

Admit for further observation and management (L&D, ICU, unit with telemetry)

Signs and symptoms of eclampsia, abnormal neurological evaluation, congestive heart failure, renal failure, coagulopathy, poor response to antihypertensive treatment

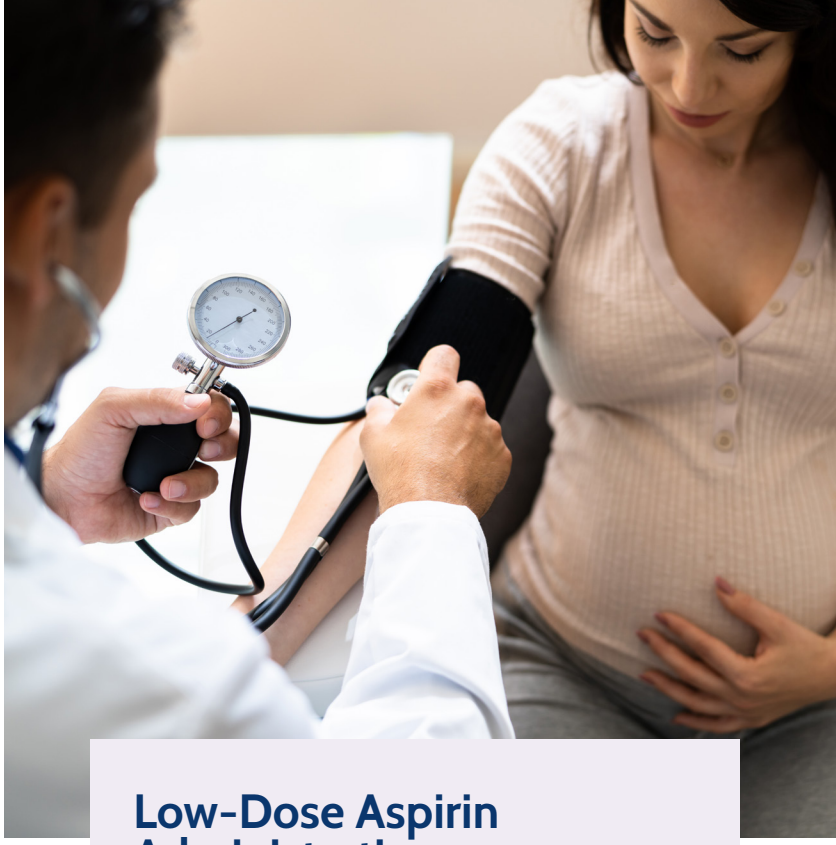
Recommend emergency consultation for further evaluation (MFM, internal medicine, OB anesthesiology, critical care)

Supporting Transitions of Care

Health issues in pregnancy such as gestational diabetes, heart problems, or high blood pressure are likely to develop in the future. Women who experience such complications should have risk-appropriate collaborative care in the postpartum period. Education on the importance of the postpartum visit, what to expect during the visit and providers that they may encounter can help to increase visit attendance.

Hypertension in Pregnancy and Preeclampsia

Women with preeclampsia have an increased risk of recurrence in subsequent pregnancies. These women also have a two-fold increase risk of subsequent cardiovascular disease. Uncontrolled hypertension in the postpartum period increases the risk of stroke. Long-term uncontrolled hypertension leads to end organ damage, renal disease, and cardiovascular disease. Early follow up and close monitoring is important during the postpartum period.



Low-Dose Aspirin Administration

Low-dose aspirin (81 mg/day) prophylaxis is recommended for women at ***high risk*** of preeclampsia and should be initiated between 12 weeks and 28 weeks of gestation (optimally before 16 weeks) and continued daily until delivery.

If one or more risk factors exist, recommend low-dose aspirin:

a. History of preeclampsia
b. Multifetal gestation
c. Chronic hypertension
d. Type 1 or 2 diabetes
e. Renal disease
f. Autoimmune disease
g. Combinations of multiple moderate risk factors

For moderate and low risk level recommendations see: US Preventive Services Task Force. Aspirin Use to Prevent Preeclampsia and Related Morbidity and Mortality: US Preventive Services Task Force Recommendation Statement. JAMA. 2021;326(12):1186–1191.

Heart Health: The 3-month Cardiovascular Visit

Cardiovascular disease and cardiomyopathy are the leading cause of maternal mortality in North Carolina. The majority of cardiovascular disease mortality occurs after 42 days postpartum. A comprehensive postpartum cardiovascular visit should be scheduled at three months for patients with any of the conditions below:

- Transitions to interconception ongoing care should be seen by a primary care provider or cardiology if necessary or required.
- Chronic hypertension or hypertensive disorders of pregnancy
- Gestational Diabetes or Pregestational diabetes
- Intrauterine fetal growth restriction
- Idiopathic preterm birth
- Placental abruption
- Obesity, excessive pregnancy weight gain, or postpartum weight retention
- Sleep disorders or moderate-to-severe obstructive sleep apnea
- Maternal age older than 40 years.

Community Care of North Carolina Pregnancy Medical Home Program has developed a clinical pathway to care for women with complications. For more information on management and care of chronic illness and the transition click here.

Postpartum Follow-up Timeline

Severe Hypertension	Within 3-5 Days
Hypertensive Disorders	Within 7-10 Days
Heart Disease/ CV Disorders	Within 7-14 Days
All CV patients	3 Months

Provider Resources

- Algorithm for Postpartum CVD Assessment and Management: ACOG Pregnancy and Heart Disease Practice Bulletin No 212
- NC Pregnancy Medical Home Postpartum Blood Pressure Management Guidelines
- Guide to Contraception for Women with CVD
- Guide to CVD Medications for Pregnant and Breastfeeding Women
- Community Care of North Carolina tip sheet on obtaining home blood pressure monitors

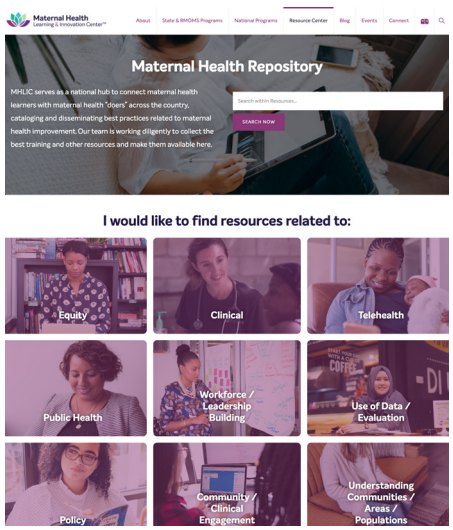
Patient Resources

- Women with diabetes and hypertensive disorders in pregnancy should be counseled about their substantially higher risk of future CVD. Give them this infographic sheet and post it in your clinic, available in English and Spanish.
- Community Care of North Carolina tip sheet for accurate home blood pressure monitoring.

Provider Education and Training

Role specific educational protocols for providers and staff should focus on utilizing accurate methods to assess blood pressures (including BP cuff size, proper patient positioning, and timing), protocols for treatment, escalation of care, standards for patient education, and peripartum racial and ethnic disparities and their root causes.

The Maternal Health and Learning Innovation Center is a national learning center. Its mission is to foster collaboration and learning among diverse stakeholders to accelerate evidence-informed interventions to advance equitable maternal health outcomes through engagement, innovation, and policy. For resources and tools to support education and training, please visit https://maternalhealthlearning.org/resources/



Shared Decision-Making

Shared decision-making brings at least two experts to the table: women/families and their health care providers. Working as a team honors the experiences and knowledge of both groups and can lead to decisions and care plans that are achievable and align with patient preferences and quality clinical care. Refer to the Center for Shared Decision Making for more information and resources.

Implicit Bias Trainings

The Office of Minority Health (US Department of Health and Human Services) offers a 2 hour e-learning program designed or providers and students seeking knowledge and skills related cultural competency, cultural humility, person-centered care, and combating implicit bias across the continuum of maternal health care. https://thinkculturalhealth.hhs.gov/education/maternal-health-care

Quality Improvement

Improving Outcomes

Monitoring outcomes and process metrics supports improved outcomes. Implementing a culture of safety that is inclusive of huddles, debriefs, and closed loop communication can create a framework to continually assess outcomes. Implementation of multidisciplinary reviews of all severe hypertension/pre-eclampsia cases transferred to the hospital for systems and communications issues, including attention to care transitions and continuity of care can provide an evaluation of systems currently in place. Outcome data should be inclusive of results stratified by race and ethnicity.

Outpatient Hypertension Simulations

Simulations provide teams the opportunity to test systems and protocols. Sample simulations can be located on the Provider Support Network website: https://www.mombaby.org/outpatient-bundle-for-severe-hypertension

Debriefs

Debriefing provides an opportunity for all to assess the status of a particular process. Debriefs can be short and informal by asking 3 simple questions: What went well? What are our opportunities? What could be done differently next time?

Sample Debrief Outpatient Hypertension Tool:

Team (CMA/nurse/ provider)	Done	Not done	Improvement opportunity	N/A	Notes
Recognizes severe hypertension in a timely manner					
Elicits patient history of severe symptoms (headache, vision changes and/or RUQ pain)					
Retakes BP using proper technique and proper cuff size within 15 minutes					
Notifies provider					
Administers PO Nifedipine (if available)					
Reassesses BP and re-treats severe range blood pressures at appropriate intervals					
Communicates diagnosis of severe hypertension/ preeclampsia and escalation plan with staff					
Communicates severe hypertension/ preeclampsia diagnosis and plan with patient and support person					
Calls for transfer/ transport					

Resources for Your Practice

go.unc.edu/RegionIV

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