TuftsMedicine
Lowell General Hospital

Hospital Policy and Procedure Manual, Maternal Child Health

Title: *Management of Hypertensive Disorders of Pregnancy*
Author/Reviewer: *Labor and Delivery Clinical Manager*
IMPORTANT NOTICE: The official version of this policy is contained in Ellucid and may have been revised since the document was printed.

I. PURPOSE:

To promote safe and timely identification and management of Hypertensive Disorders during pregnancy and up to 6 weeks postpartum.

II. SCOPE:

Labor & Delivery Registered Nurse (RN), Maternal Infant Unit RN, Maternal Infant Unit Licensed Practical Nurse (LPN), Emergency Department RN, Critical Care RN, Obstetrical Care Providers, Emergency Department Providers, Anesthesia Providers

III. DEFINITIONS:

1) **Hypertension:** A systolic blood pressure level of 140mmHg or higher OR a diastolic blood pressure of 90mmHg or higher on 2 occasions at least 4 hours apart.
2) **Severe Hypertension:** A systolic blood pressure level greater than or equal to 160mmHG OR diastolic blood pressure level greater than or equal to 110mmHg.
3) **Hypertensive Emergency:** Two severe hypertension values taken 15-60 minutes apart. Do not need to be consecutive. Can occur antepartum, intrapartum or postpartum.
4) **Gestational Hypertension**:
   - New onset of systolic blood pressure of 140mmHg or higher or diastolic blood pressure of 90mmHg or higher on at least 2 occasions 4 hours apart after 20 weeks of gestation in a previously normotensive individual
     AND:
   - no proteinuria and no severe features of preeclampsia (thrombocytopenia, renal insufficiency, elevated liver transaminases, pulmonary edema, cerebral or visual symptoms).
5) **HELLP syndrome:** Presence of Hemolysis, Elevated Liver enzymes, and Low Platelet count; hypertension may be present (HELLP in such cases is often considered a variant of preeclampsia).
6) **Preeclampsia without severe features:**
   - New onset of systolic blood pressure of 140mmHg or higher or diastolic blood pressure of 90mmHg or higher on at least 2 occasions at least 4 hours apart after 20 weeks of gestation in a previously normotensive individual **OR** systolic blood pressure 160mmHg or higher or diastolic blood pressure 110mmHg or higher confirmed within a short interval (minutes) to facilitate timely antihypertensive therapy
     AND:
   - Proteinuria (greater than or equal to 300 mg per 24-hour urine collection or protein: creatinine ratio greater than or equal to 0.3, or urine dipstick reading greater than or equal to 2+ [if other quantitative methods are not available]).

Or, in the absence of proteinuria, new-onset hypertension with the new onset of any of the following:

- Thrombocytopenia (platelet count less than 100,000 per microL)
- Renal insufficiency (serum creatinine of greater than 1.1 mg/dL or a doubling of the serum creatinine concentration in the absence of other renal disease)
- Impaired liver function as indicated by liver transaminase levels at least twice the normal concentration
- Pulmonary edema
- Persistent cerebral or visual symptoms

7) **Preeclampsia with severe features:**
Any of these findings in a patient with preeclampsia:
   - Systolic blood pressure greater than or equal to 160 mmHg or diastolic blood pressure greater than or equal to 110 mmHg on 2 occasions at least 4 hours apart (unless antihypertensive therapy is initiated before this time)
   - Thrombocytopenia (platelet count less than 100,000 per microL)
   - Impaired liver function as indicated by liver transaminase levels at least twice the normal concentration or severe persistent right upper quadrant or epigastric pain unresponsive to medication and not accounted for by alternative diagnoses, or both
   - Progressive renal insufficiency (serum creatinine concentration greater than or equal to 1.1 mg/dL or a doubling of the serum creatinine concentration in the absence of other renal disease)
   - Pulmonary edema
   - Persistent cerebral or visual disturbances
8) **Chronic Hypertension**:
   - Hypertension diagnosed or present before pregnancy or before 20 weeks of gestation. Hypertension that is first diagnosed during pregnancy and persists for at least 12 weeks post-delivery is also considered chronic hypertension.
   - The blood pressure criteria are systolic blood pressure greater than or equal to 140 mmHg, diastolic blood pressure greater than or equal to 90 mmHg, or both. Ideally, this diagnosis is based on at least 2 elevated blood pressure measurements taken at least 4 hours apart. In the setting of severe hypertension, the diagnosis can be confirmed in a shorter interval to facilitate timely treatment.
9) **Chronic Hypertension with superimposed preeclampsia:** Any of these findings in a patient with chronic hypertension:
   - Monitor vital signs including oxygen saturation
10) **Chronic Hypertension with superimposed preeclampsia with severe features:** Any of these findings in a patient with chronic hypertension and superimposed preeclampsia:
   - Systolic blood pressure greater than or equal to 160 mmHg or diastolic blood pressure greater than or equal to 110 mmHg despite escalation of antihypertensive therapy
   - Thrombocytopenia (platelet count less than 100,000 per microL)
   - Impaired liver function as indicated by liver transaminase levels at least twice the normal concentration or severe persistent right upper quadrant or epigastric pain unresponsive to medication and not accounted for by alternative diagnoses, or both
   - New-onset or worsening renal insufficiency
   - Pulmonary edema
   - Persistent cerebral or visual disturbances
11) **Eclampsia:** In a patient with preeclampsia, generalized seizures that cannot be attributed to other causes.

IV. POLICY

Patients identified as having a hypertensive disorder will be managed according to the procedures below.

V. PROCEDURE:

1) Blood pressure should be assessed after patient has rested (ideally 5 minutes or more) and is seated with legs uncrossed and back supported using an appropriately sized cuff positioned at the level of the heart. If patient must be in a recumbent position, they should be placed in a left lateral decubitus position with cuff located at level of the right atrium.
2) Notify OB Provider for severe range blood pressures.
3) If two elevated blood pressures within 30 minutes, consider preeclampsia labs.
4) If blood pressure values meet criteria for a Hypertensive Emergency, treatment should be initiated within 30-60 minutes. See Treatment of Hypertensive Emergency algorithm.

- Goal blood pressure during a Hypertensive Emergency is to reduce blood pressure by no more than 25% over 2 hours to achieve a target of 130-150mmHg systolic and 80-100mmHg diastolic. Aggressively lowering blood pressure (eg, less than 120/80mmHg) may be associated with decreased uteroplacental perfusion.
- Continuous cardiac monitoring is not necessary routinely but should be used in patients with relative comorbidities (eg, coronary artery disease).

5) Assess for signs of preeclampsia: visual disturbances, headaches, nausea or vomiting, epigastric or right upper quadrant (RUQ) pain, hyperreflexia, clonus.
6) Position patient in lateral tilt or hip wedge.
7) If indicated, maintain strict Intake and output (I&O). Notify OB Provider for urine output less than 30mL per hour or 100mL per 4 hours.
8) If indicated, decrease external stimuli and dim lights. Consider the need for seizure precautions, including magnesium sulfate and padded bed rails.
9) In the rare circumstance that IV bolus labetalol, hydralazine, or immediate release oral nifedipine fails to relieve acute-onset, severe hypertension and is given in successive appropriate doses, emergent consultation with an anesthesiologist, hospitalists, maternal–fetal medicine subspecialist, or critical care subspecialist to discuss second-line intervention is recommended.
10) Consider transfer to a higher level of care if indicated.
11) Guidance on when to consider emergent delivery.
    a. The mode of delivery in women with gestational hypertension or preeclampsia (with or without severe features) should be determined by routine obstetric considerations. The decision to perform cesarean delivery should be individualized, based on anticipated probability of vaginal delivery and on the nature and progression of preeclampsia disease state (see guidance on eclamptic seizures below).
12) Guidance on caring for a patient experiencing eclamptic seizure.
    a. Initiate supportive measures:
        i. Call for help
        ii. Prevent maternal injury
        iii. Place in lateral decubitus position
        iv. Prevent aspiration
        v. Administer oxygen
        vi. Monitor vital signs including oxygen saturation
        vii. Following seizure:
            1. Suction mouth with Yankauer
            2. Give oxygen by non-rebreather at 10L per minute
            3. Provide ventilatory support as needed.
            4. Monitor blood pressure (BP), pulse and respiratory rate (RR) every 5 min
            5. Assess O2 saturation and level of consciousness every 15 minutes until stable for at least an hour.
            6. Observe for signs of placental abruption or impending delivery.
            7. Consider order for indwelling catheter.
    b. Most eclamptic seizures are self-limited; only subsequently is attention directed to administration of magnesium sulfate, to prevent recurrent convulsions.
    c. Fetal heart rate decelerations are usually seen during eclamptic seizures; after a seizure the fetal heart rate may show recurrent decelerations, tachycardia and reduced variability due to maternal hypoxia and hypercarbia. ***Only after maternal hemodynamic stabilization should one proceed with delivery.*** Maternal resuscitation is usually followed by normalization of the fetal tracing; best treatment for baby is maternal stabilization.
    d. Magnesium sulfate administered IM or IV is the drug of choice for prevention of recurrent seizures. An additional dose of magnesium sulfate could be administered if convulsions recur. In cases refractory to magnesium sulfate (still seizing at 20 minutes after bolus or more than two recurrences) alternate therapies may include sodium amobarbital, thiopental, or phenytoin. Endotracheal intubation and assisted ventilation in the ICU as well as head imaging may also be considered. Emergent consultation with an anesthesiologist, hospitalists, maternal–fetal medicine subspecialist, or critical care subspecialist to discuss second-line intervention is recommended.
    e. ***Women with eclampsia should be delivered in a timely fashion. However, eclampsia by itself is not an indication for cesarean delivery.*** Once the patient is stabilized the method of delivery should depend in part on factors such as gestation age, fetal presentation, and the findings of the cervical exam. Patients that adequately progress in labor could be allowed to continue to labor even after an eclamptic seizure.

13) Cases that meet the following established criteria will be reviewed by the hospital to evaluate the effectiveness of care, treatment, and services provided to the patient. Severe hypertension/preeclampsia resulting in, but not limited to:
    a. Maternal death
    b. Identification of HELLP Syndrome
    c. Pulmonary Edema
    d. Maternal Seizure

VI. REFERENCE(S): Check dates

1) Gestational hypertension and preeclampsia. ACOG Practice Bulletin No. 222. American College of Obstetricians and Gynecologists. Obstet Gynecol 2020; 135:e237-260.
2) Chronic hypertension in pregnancy. ACOG Practice Bulletin No. 203. American College of Obstetricians and Gynecologists. Obstet Gynecol 2019; 133:e26-50.
3) Emergent therapy for acute-onset, severe hypertension during pregnancy and the postpartum period. ACOG Committee Opinion No. 767. American College of Obstetricians and Gynecologists. Obstet Gynecol 2019;133:e174–80. https://www.cmqcc.org/resource/ante-intra-postpartum-nursing-management-and-assessment-preeclampsia-maternalfetal-0. **(Last accessed 4/2024)**
4) Druzin M, Shields L, Peterson N, Sakowski C, Cape V, Morton C. Improving Health Care Response to Hypertensive Disorders of Pregnancy, a California Maternal Quality Care Collaborative Quality Improvement Toolkit, 2021.
5) August, P. Treatment of hypertension in pregnant and postpartum patients. In *UpToDate,* Barss, VA (ed.), UpToDate, Waltham, MA. **(Accessed on 4/2024)**
6) The Joint Commission. (2024). Prevision of Care. Reduce the likelihood of harm related to maternal sever hypertension/preeclampsia. PC.06.03.01

VII. ATTACHMENTS:

Attachment A: Treatment of Hypertensive Emergency During Pregnancy and Postpartum Period

VIII. POLICY TRACKING RECORD

10/19, 06/20, 04/21; Alias Manual, Vol. 1 Provision of Care, Treatment and Services 6/22; 9/23, 4/24

IX. ENDORSEMENT:

Labor and Delivery Manager, Perinatal Committee, Regulatory Compliance Specialist, Policy Review Committee, Nursing Practice Council, VP Patient Care Services, CNE

Attachment A:

Treatment of Hypertensive Emergency During Pregnancy and Postpartum Period

Acute-onset, severe systolic (≥160 mm Hg) hypertension; severe diastolic (≥ 110 mm Hg) hypertension; **or both** in a pregnant person or a person in the postpartum period.

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Notify OB Care Provider, obtain IV access, & institute continuous fetal monitoring if undelivered. Recheck blood pressure within 10-15 minutes – **DO NOT** reposition patient to either side to lower pressure. This will give you a false reading.

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If severe BP elevations persist for 15 minutes or more, initiate Antihypertensive Therapy ASAP, within 60 minutes. **The goal is not to normalize BP, but to achieve a range of 130-150/80-100 mm Hg.** Antihypertensive treatment and magnesium sulfate should be administered simultaneously. If this is not possible, antihypertensive treatment should be 1st priority.

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NOTE contraindications include: asthma & HR < 50. Cumulative max dose is 300mg.

Labetalol 20 mg IV over 2 minutes
Repeat BP in **10 minutes**
If either BP threshold is still exceeded, administer **Labetalol 40 mg IV** over 2 minutes. If BP is below threshold, continue to monitor BP closely.
Repeat BP in **10 minutes**
If either BP threshold is still exceeded, administer **Labetalol 80 mg IV** over 2 minutes. If BP is below threshold, continue to monitor BP closely.
Repeat BP in **10 minutes**
If either BP threshold is still exceeded, administer **Hydralazine 10 mg IV** over 2 minutes. If BP is below threshold, continue to monitor BP closely.
Repeat BP in **20 minutes**
If either BP threshold is still exceeded, obtain emergency consultation from MFM, Internal Medicine, Anesthesia or Critical Care

NOTE: If a total cumulative dose of 20-30mg per treatment event does not achieve optimal blood pressure control or HR exceeds 100bpm, another agent should be used.

Hydralazine 5 mg or 10 mg IV over 2 minutes
Repeat BP in **20 minutes**
If either BP threshold is still exceeded, administer **Hydralazine 10 mg IV** over 2 minutes. If BP is below threshold, continue to monitor BP closely.
Repeat BP in **20 minutes**
If either BP threshold is still exceeded, administer **Labetalol 20 mg IV** over 2 minutes. If BP is below threshold, continue to monitor BP closely.
Repeat BP in **10 minutes**
If either BP threshold is still exceeded, administer **Labetalol 40 mg IV** over 2 minutes and obtain emergency consultation from MFM, Internal Medicine, Anesthesia or Critical Care

NOTE: May be associated with precipitous drop in BP, monitor closely.

Nifedipine IR (Immediate Release) 10 mg orally
Repeat BP in **20 minutes**
If either BP threshold is still exceeded, administer **Nifedipine IR 20 mg orally**. If BP is below threshold, continue to monitor BP closely.
Repeat BP in **20 minutes**
If either BP threshold is still exceeded, administer **Nifedipine IR 20 mg orally**. If BP is below threshold, continue to monitor BP closely.
Repeat BP in **20 minutes**
If either BP threshold is still exceeded, administer **Labetalol 20 mg IV** over 2 minutes and obtain emergency consultation from MFM, Internal Medicine, Anesthesia or Critical Care

Once the aforementioned BP thresholds are achieved, repeat BP measurement every 10 minutes for 1 hour, then every 15 minutes for 1 hour, then every 30 minutes for 1 hour, then every hour for 4 hours at a minimum (intrapartum patients may be monitored more frequently).