

Pregnancy Medical Home Program Care Pathway:

Management of women with hypertensive disorders of pregnancy

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A. Background

Preeclampsia is a leading cause of iatrogenic preterm birth. In the past, severe preeclampsia was treated by timely delivery. Current data suggest improved perinatal outcomes with expectant management of severe preeclampsia (1). The average gestational age gained with expectant management of severe preeclampsia ranges from 7-14 days (2). Patients with superimposed preeclampsia are treated in a similar fashion as those with severe preeclampsia (3). Patients with mild preeclampsia should be managed expectantly until ≥ 37 weeks (4).

B. Definitions

Definitions apply to women at a gestational age > 20 weeks (5)

- I. Gestational hypertension: A systolic BP ≥ 140 mmHg or diastolic BP ≥ 90 mmHg taken on 2 occasions >6 hours apart but < 7 days apart in the absence of proteinuria that occurs after 20 weeks of gestation in a woman with previously normal blood pressure.
- II. Preeclampsia: A systolic BP ≥ 140 mmHg or diastolic BP ≥ 90 mmHg taken on 2 occasions > 6 hours apart but < 7 days apart in the presence of new onset proteinuria after 20 weeks of gestation. Preeclampsia is not defined as an increase in BP of 30/15 mmHg over baseline.
- III. Severe gestational hypertension: Unexplained elevation in systolic BP ≥ 160 mmHg or diastolic BP ≥ 110 mmHg after 20 weeks of gestation in the absence of proteinuria.
- IV. Chronic hypertension with superimposed preeclampsia: Onset of proteinuria in a woman with preexisting hypertension, sudden increase in proteinuria if already present in early gestation, sudden increase in hypertension or development of HELLP syndrome, beyond 20 weeks of gestation.

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- V. Severe Preeclampsia: Mild preeclampsia plus any of the following:
- a. Severe hypertension (systolic BP \geq 160 mmHg or diastolic BP \geq 110 mmHg in a patient with no history suggestive of chronic hypertension taken on at least 2 occasions at least 6 hours apart within 24 hours)
 - b. Renal involvement
 - i. Proteinuria \geq 5 gram/24 hours
 - ii. Oliguria: $<$ 500 ml/24 hours
 - iii. Elevated creatinine or decreased creatinine clearance
 - c. Evidence of end organ involvement
 - i. Unremitting headache not responsive to analgesics
 - ii. Epigastric/right upper quadrant pain
 - iii. Intractable nausea/vomiting
 - iv. Cerebral or visual disturbances
 - v. Pulmonary edema
 - d. Laboratory evidence of full or partial HELLP syndrome (unexplained thrombocytopenia or elevated liver enzymes)
 - a. Thrombocytopenia
 - b. Elevated liver enzymes
 - c. Hemolysis
 - e. Fetal parameters
 - a. Intrauterine growth restriction
 - b. Oligohydramnios
- VI. Proteinuria: 300mg in 24 hour urine collection or 150 mg in a 12 hour collection or urine dipstick of \geq +2 on at least 2 voided specimens (6), or spot Protein : Creatinine ratio \geq 0.3. Timed urine collection supercedes dipstick measurements.

C. Management of mild preeclampsia

- I. Setting for management: Outpatient with close follow-up or inpatient in a facility with obstetrical services available. Women with severe preeclampsia, chronic hypertension with superimposed preeclampsia, or non-compliance should be hospitalized.
- II. Patient should be evaluated at least twice weekly for evidence of progression to severe preeclampsia by measurement of blood pressure and questions about symptoms.
- III. Fetal testing should occur with daily fetal kick counts and at least twice-weekly by biophysical profile or non-stress test. Amniotic fluid volume should be determined weekly.



- IV. Ultrasound performed at 2-3 week intervals to evaluate for growth restriction.
- V. Laboratory testing for evidence of thrombocytopenia, elevated liver enzymes or hemolysis should occur at diagnosis and repeated with changes in clinical characteristics or at least weekly.
- VI. Once a diagnosis of mild preeclampsia is established at or near term, timed urine collections are not warranted as expectant management may continue despite the severity of proteinuria.
- VII. Oral anti-hypertensive medications should not be used in non-severe cases of preeclampsia or gestational hypertension.
- VIII. Indications for delivery
 - a. ≥ 37.0 weeks
 - b. Non-reassuring fetal testing
- IX. Mode of delivery
 - a. Vaginal is preferred. Cesarean deliveries are reserved for the usual obstetrical indications.
- X. Seizure prophylaxis
 - a. Data strongly support the use of intrapartum magnesium sulfate for severe disease. The literature for mild preeclampsia remains unclear.
 - b. If using magnesium sulfate, therapy should continue for 12-24 hours postpartum or when urine output is ≥ 150 ml per hour for 3 hours.

D. Management of gestational hypertension

Pregnancies with gestational hypertension should be closely monitored for the development of preeclampsia, severe gestational hypertension or atypical preeclampsia. Women with severe gestational hypertension or gestational hypertension with symptoms should be hospitalized and evaluated for atypical preeclampsia (7).

E. Management of severe preeclampsia or chronic hypertension with superimposed preeclampsia

- I. Treatment: clear gestational dating criteria ≥ 34.0
 - a. Magnesium sulfate
 - b. Delivery at local hospital if maternal and newborn support is available
- II. Treatment: estimated gestational age < 34.0 weeks
 - a. Women with suspected early onset severe preeclampsia should be admitted for evaluation and consideration of transfer to a center with available MFM consultation.
 - b. Initial evaluation for a candidate for expectant management while being admitted or transferred:
 - i. Intravenous magnesium sulfate
 - ii. Antenatal corticosteroids

- iii. Continuous fetal monitoring as appropriate for gestational ages 24w0d – 33w6d
- iv. Laboratory evaluation:
 - 1. HELLP syndrome
 - 2. CBC, AST, LDH, total bilirubin
 - 3. Initiation of 24-hour urine for total protein and creatinine clearance
 - 4. Measure urine output

III. Patient Counseling

- a. Patient should be offered expectant management versus delivery
 - i. Maternal risks and approximate incidence:
 - 1. HELLP syndrome: 20%
 - 2. Eclampsia: 2%
 - 3. Pulmonary edema: 5%
 - 4. Acute renal failure: 2%
 - 5. Maternal death: rare
 - ii. Fetal risks:
 - 1. Worsening fetal condition: 40%
- b. Expectant management benefits the fetus by increasing gestational age at delivery, and carries some risk to the mother. Fetal death is an absolute contraindication to expectant management for severe disease in singleton pregnancies.
- c. Severe hypertension and severe proteinuria are not indications for delivery.
 - i. Severe hypertension is a rare indication for delivery and is dependent on gestational age and severity of hypertension. Most women with severe hypertension can be managed with utilization of various antihypertensive medications.
 - ii. The amount of proteinuria by itself is not an indication for delivery in women with severe early onset preeclampsia.

References

1. Sibai BM. Evaluation and management of severe preeclampsia before 34 weeks' gestation. SMFM Clinical Opinion. AJOG 2011; 205(3): 191-8.
2. Magee LA, et al. Expectant management of severe preeclampsia remote from term: a structured systemic review. Hypertens Pregnancy 2009; 28(3): 312-47.
3. Sibai BM. Diagnosis and management of gestational hypertension and preeclampsia. Obstet Gynecol 2003; 102(1): 181-92.
4. Sibai BM. Management of late preterm and early-term pregnancies complicated by mild gestational hypertension/pre-eclampsia. Semin Perinatol. 2011 Oct;35(5):292-6.
5. American College of Obstetricians and Gynecologists. Diagnosis and management of preeclampsia and eclampsia. ACOG practice bulletin No. 33. Obstet Gynecol 2002; 77(1): 67-75.
6. Waugh JJ, Clark TJ, Divakaran TG, Khan KS, Kilby MD. Accuracy of urinalysis dipstick techniques in predicting significant proteinuria in pregnancy. Obstet Gynecol. 2004 Apr;103(4):769-77.
7. Report of the National High Blood Pressure Education Program Working Group on High Blood Pressure in Pregnancy. Am J Obstet Gynecol 2000;183:S1-22.

Note: Pregnancy Medical Home Care Pathways are intended to assist providers of obstetrical care in the clinical management of problems that can occur during pregnancy. They are intended to support the safest maternal and fetal outcomes for patients receiving care at North Carolina Pregnancy Medical Home practices. This pathway was developed after reviewing ACOG resources such as practice bulletins, committee opinions, and Guidelines for Perinatal Care as well as current obstetrical literature. PMH Care Pathways offer a framework for the provision of obstetrical care, rather than an inflexible set of mandates. Clinicians should use their professional knowledge and judgment when applying pathway recommendations to their management of individual patients.