Gestational Hypertension

Women who develop hypertension after 20 weeks' gestation and who do not have proteinuria or other criteria for preeclampsia are diagnosed with gestational hypertension.

Approximately 50% of women diagnosed with gestational hypertension between 24 and 35 weeks' gestation ultimately develop preeclampsia.

Management of gestational hypertension is similar to that of preeclampsia, with expectant monitoring and labor induction at 37 weeks' gestation.

Chronic hypertension in pregnancy:

- Hypertension that is diagnosed or present before pregnancy
- Or hypertension that is diagnosed or present before ~20 weeks gestation
- Or hypertension that is diagnosed for the first time in pregnancy that does not resolve postpartum

Chronic hypertension with superimposed preeclampsia:

- Preeclampsia complicating pre-existing chronic hypertension
- Or preeclampsia in a woman with a history of hypertension before pregnancy
- Or preeclampsia in a woman with a history of hypertension before ~20 weeks gestation
- This may be further classified as chronic hypertension with superimposed preeclampsia with severe features or chronic hypertension with superimposed preeclampsia without severe features.

Risk Factors for Preeclampsia

Nulliparity
Multifetal gestations
Preeclampsia in a previous pregnancy
Chronic hypertension
Pregestational diabetes and Gestational diabetes
Thrombophilia
Systemic lupus erythematosus
Prepregnancy body mass index greater than 30
Antiphospholipid antibody syndrome
Maternal age 35 years or older
Kidney disease
Assisted reproductive technology
Obstructive sleep apnea

. Diagnostic Criteria for Preeclampsia

- Blood pressure
- Mild: Systolic blood pressure of 140 mm Hg or more or diastolic blood pressure of 90 mm Hg or more on two occasions at least 4 hours apart after 20 weeks of gestation in a woman with a previously normal blood pressure
- Severe: Systolic blood pressure of 160 mm Hg or more or diastolic blood pressure of 110 mm Hg or more. (Severe hypertension can be confirmed within a short interval (minutes) to facilitate timely antihypertensive therapy).

Proteinuria

300 mg or more per 24 hour urine collection (or this amount extrapolated from a timed collection) or Protein/creatinine ratio of 0.3 mg/dL or more or Dipstick reading of 2+ (used only if other quantitative methods 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/mL
Renal insufficiency: Serum creatinine concentrations greater than 1.1 mg/dL or a doubling of the serum creatinine concentration in the absence of other renal disease
Impaired liver function: Elevated blood concentrations of liver transaminases to twice normal concentration
Pulmonary edema
New-onset headache unresponsive to medication and not accounted for by alternative diagnoses or visual symptoms

Eclampsia

- The convulsive manifestation of hypertensive disorders in pregnancy.
- New onset tonic-clonic, focal or multifocal seizures in the absence of other causative conditions.
- A significant proportion of women do not demonstrate classic signs of preeclampsia before seizure episode.
- The prevention of eclampsia is empirically based on the concept of timely delivery
- A significant body of evidence attests to the efficacy of magnesium sulfate to prevent seizures in women with preeclampsia with severe features and eclampsia.

HELLP

- A subset of preeclampsia that includes:
- hemolysis
- elevated liver enzymes
- low platelets.
- Criteria suggesting the diagnosis may include:
- Lactate dehydrogenase (LDH) > 600 IU/L
- AST and ALT greater than twice the upper limits of normal
- Platelet count of less than 100,000/microliter

- treating mild to moderately elevated BP does not benefit the fetus or prevent preeclampsia.
- Overtreatment may cause adverse perinatal outcomes resulting from placental hypoperfusion.
- so medication is reserved for women with BP persistently greater than 150/100 mm Hg.
- Women with chronic hypertension should be monitored for intrauterine growth restriction with serial ultrasonography after fetal viability, with intervals dependent on the severity of hypertension, comorbidities, and obstetric history.

- Methyldopa, labetalol, and nifedipine are the most commonly used oral agents to treat severe chronic hypertension in pregnancy.
- Angiotensin-converting enzyme inhibitors and angiotensin II receptor blockers are contraindicated because of their association with intrauterine growth restriction, neonatal renal failure, oligohydramnios, and death.
- The beta blocker atenolol also may cause intrauterine growth restriction.
- Thiazide diuretics that were used before pregnancy may be continued, but should be stopped if preeclampsia develops to avoid worsening intravascular volume depletion.

Clinical Risk Factors and Aspirin Use

- Recommendation High Risk Factors :
- History of preeclampsia, especially when accompanied by an adverse outcome Recommend low-dose aspirin if the patient has one or more of these high-risk factors
- Multifetal gestation
- Chronic hypertension
- Type 1 or 2 diabetes
- Renal disease
- Autoimmune disease (ie, systemic lupus erythematosus, the antiphospholipid syndrome)
- Moderate Risk Factors:
- Nulliparity
- Consider low-dose aspirin if the patient has more than one of these moderate-risk factors Obesity (body mass index greater than 30)
- Family history of preeclampsia (mother or sister),

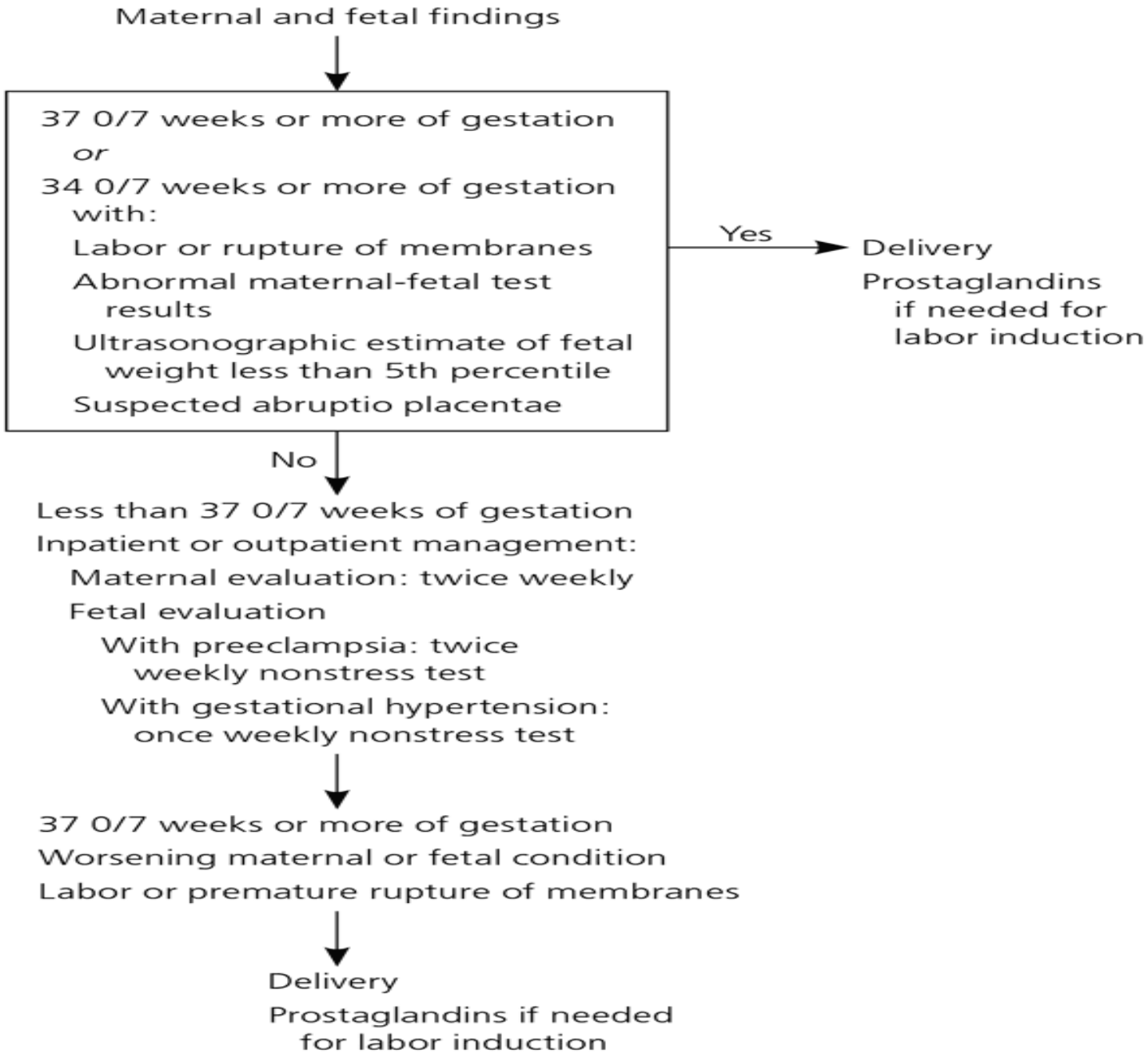
- Sociodemographic characteristics
- African American race
- low socioeconomic status
- Age 35 years or older
- Personal history factors (eg, low birth weight or small for gestational age, previous adverse pregnancy outcome, more than 10-year pregnancy interval).
- Low: Previous uncomplicated full-term delivery Do not recommend low-dose aspirin
- should receive low-dose (81 mg/day) aspirin for preeclampsia prophylaxis, initiated between 12 weeks and 28 weeks of gestation (optimally before 16 weeks of gestation) and continuing until delivery.

Conditions Precluding Expectant Management

- **Maternal**
- Uncontrolled severe-range blood pressures (persistent systolic blood pressure 160 mm Hg or more or diastolic blood pressure 110 mm Hg or more not responsive to antihypertensive medication
- Persistent headaches, refractory to treatment
- Epigastric pain or right upper pain unresponsive to repeat analgesics
- Visual disturbances, motor deficit or altered sensorium
- Stroke
- Myocardial infarction
- HELLP syndrome
- New or worsening renal dysfunction (serum creatinine greater than 1.1 mg/dL or twice baseline)
- Pulmonary edema
- Eclampsia
- Suspected acute placental abruption or vaginal bleeding in the absence of placenta previa

- **Fetal**
- Abnormal fetal testing
- Fetal death
- Fetus without expectation for survival at the time of maternal diagnosis (eg, lethal anomaly, extreme prematurity)
- Persistent reversed end-diastolic flow in the umbilical artery

- If delivery is indicated at less than 34 0/7 weeks of gestation, administration of corticosteroids for fetal lung maturation is recommended.
- delaying delivery for optimal corticosteroid exposure may not always be advisable.


Maternal and fetal findings
37 0/7 weeks or more of gestation
or
34 0/7 weeks or more of gestation with:
Labor or rupture of membranes
Abnormal maternal-fetal test results
Ultrasonographic estimate of fetal weight less than 5th percentile
Suspected abruptio placentae
Yes
Delivery
Prostaglandins if needed for labor induction
No
Less than 37 0/7 weeks of gestation
Inpatient or outpatient management:
Maternal evaluation: twice weekly
Fetal evaluation
With preeclampsia: twice weekly nonstress test
With gestational hypertension: once weekly nonstress test
37 0/7 weeks or more of gestation
Worsening maternal or fetal condition
Labor or premature rupture of membranes
Delivery
Prostaglandins if needed for labor induction

MFM Treatment of Severe Hypertension Algorithm

Systolic BP ≥ 160 mmHg and/or
Diastolic BP ≥ 110 mmHg
2 times 15 minutes apart (notify provider after 1st)

- Inform OB Team
- IV Access
- Monitor FHR
- Send Labs

Hypertensive Medication

PO NIFEDIPINE
10 mg PO

Repeat BP in 20 min
If severe administer
Nifedipine 20 mg PO

Repeat BP in 20 min
If severe administer
Nifedipine 20 mg PO

Repeat BP in 20 min
If severe administer
Labetalol 40 mg IV
and consult MFM

IV LABETALOL
20 mg over 2 min

Repeat BP in 10 min
If severe administer
Labetalol 40 mg

Repeat BP in 10 min
If severe administer
Labetalol 80 mg

Repeat BP in 10 min
If severe administer
Hydralazine 10 mg

Repeat BP in 20 min
If remains severe
obtain MFM consult
and repeat BP in 20 min

Hold IV Labetalol for maternal pulse under 60

IV HYDRALAZINE
5-10 mg over 2 minutes

Repeat BP in 20 min
If severe administer
Hydralazine 10 mg

Repeat BP in 20 min
If severe administer
Labetalol 20 mg

Repeat BP in 10 min
If severe administer
Labetalol 40mg AND
obtain MFM consult

Seizure Prophylaxis

Mag Sulfate bolus dose 4-6 g over 15 min, remain with pt

Mag Sulfate maintenance dose 1-2 g/hr

Complete mag assessment per protocol and check serum mag levels if indicated

Once BP thresholds are achieved, repeat BP:

- Every 10 min x 1 hour
- Then q15 min x 1 hour
- Then q30 min x 1 hour
- Then q1 hr for 4 hours

MANAGEMENT OF ECLAMPSIA

Call for help + Inform OB provider + call anesthesia

Monitor maternal Vital Signs Immediately
Bring Code cart to room

AIRWAY BREATHING

- 100% O2 via nonrebreather have suction available O2 sat probe on
- OPEN AIRWAY Jaw thrust/head tilt chin-
- Secure pt in bed rails up
- Insert oral airway if airway is obstructed
- If O2 sats fall below 94% and not able to insert oral airway insert nasal airway
- If apneic ventilate with an ambu bag

CIRCULATION

- Place patient in left lateral position
- Check O2, pulse and BP
- Maintain IV access with 1-2 large bore catheters

CONTRAINDICATIONS TO MAG:

Pulmonary edema, renal failure, myasthenia gravis

May use :

Lorazepam – 2-4 mg IV X 1

Phenytoin – 15-20 mg/kg IV X1

SEIZURE CONTROL

- Initial mag 6 g bolus IV over 20 minutes
  If no IV access Mag 10 grams of 50% solution IM 5 grams in each buttock
- If mag running already 2 g IV over 3-5 minutes
- Maintain mag maintenance dose of 1-2 g/hour
- If seizure not resolved administer Lorazepam 2-4 mg IV may repeat x 1 after 10-15 minutes

MONITOR FHR

- Make sure the FHR is being monitored
- With a goal of avoiding immediate delivery if possible anesthesia team and OB team to discuss delivery if required. Time should be allowed for FHR to return to baseline. Delivery should only be pursued if bradycardia after termination of seizure