Hypertensive Disorders in Pregnancy

Treatment of Severe Persistent Hypertension in Pregnancy

**Hydralazine Hydrochloride:**
A direct arterial smooth muscle relaxant
- Indicated for severe (systolic $\geq 160$ mmHg or diastolic $\geq 110$ mmHg), persistent (lasting 15 minutes or more) blood pressure
- Side effects include maternal hypotension, tachycardia, flushing, and headache
- Contraindicated in patients with coronary artery disease, mitral valvular rheumatic heart disease and known hypersensitivity
- Dosage with initial first-line management with hydralazine:
  1. Administer hydralazine 5 or 10 mg IV over 2 minutes
  2. Repeat BP in 20 minutes
  3. If BP is above either threshold, administer hydralazine 10 mg IV over 2 minutes
  4. Repeat BP in 20 minutes
  5. If BP is above either threshold, administer labetalol 20 mg IV over 2 minutes
  6. Repeat BP in 10 minutes
  7. If BP is above either threshold, administer labetalol 40 mg IV over 2 minutes and obtain MFM consult.
  8. Repeat BP in 10 minutes

**References:**

**Labetalol:**
A combined alpha- and beta-adrenoreceptor antagonist decreases systemic vascular resistance.
- Indicated for severe (systolic $\geq 160$ mmHg or diastolic $\geq 110$ mmHg), persistent (lasting 15 minutes or more) blood pressure
- Side effects include posture-related dizziness, scalp tingling, tiredness, headache, skin rash, fever and upper GI disturbances
• Contraindicated in patients with bronchial asthma, overt cardiac failure, greater than first degree heart block, cardiogenic shock, severe bradycardia and known hypersensitivity.
• May cause neonatal bradycardia.
• Dosage with initial first-line management with labetalol:
  1. Administer labetalol 20 mg IV over 2 minutes. Repeat BP in 10 minutes.
  2. If BP is above either threshold, administer labetalol 40 mg IV over 2 minutes.
  3. Repeat BP in 10 minutes.
  4. If BP is above either threshold, administer labetalol 80 mg IV over 2 minutes.
  5. Repeat BP in 10 minutes.
  6. If BP is above either threshold, administer hydralazine 10 mg IV over 2 minutes and obtain MFM consult.
  7. Repeat BP in 20 minutes.

References:

Nifedipine:
A calcium channel blocker that relaxes arterial smooth muscle
• Indicated for severe (systolic ≥ 160 mmHg or diastolic ≥ 110 mmHg), persistent (lasting 15 minutes or more) blood pressure
• Side effects include headache, flushing, tachycardia, and overshoot hypotension.
• Contraindicated in patients with known hypersensitivity
• Caution should be used in patients being treated concomitantly with MgSO₄. An exaggerated hypotensive response, smooth muscle blockage and respiratory depression have been reported.
• Oral nifedipine may be given with special attention to heart rate and BP in normal range. Only PO (not IV or SL)
• Dosages
  1. Administer nifedipine 10 mg PO
  2. Repeat BP in 20 minutes
  3. If BP is above either threshold, administer nifedipine 20 mg PO
  4. Repeat BP in 20 minutes
  5. If BP is above either threshold, administer nifedipine 20 mg PO
  6. Repeat BP in 20 minutes
  7. If BP is above either threshold, administer labetalol 40 mg IV over 2 minutes and obtain MFM consult.
  8. Repeat BP in 10 minutes
I. Hypertension in Pregnancy

Definition
Hypertension in pregnancy can be classified into four categories:

1. **Preeclampsia**
   a. Disorder of pregnancy associated with new onset hypertension which most often occurs after 20 weeks gestation
      i. *And* proteinuria
      ii. *Or* in the absence proteinuria, any severe feature of preeclampsia (See Box 3, page 4)
   b. HELLP syndrome is a subset of preeclampsia with severe features that includes hemolysis, elevated liver enzymes and low platelets.
   c. Eclampsia is the convulsive manifestation of hypertensive disorders of pregnancy

2. **Chronic hypertension in pregnancy:**
   d. Hypertension that is diagnosed or present before pregnancy
   e. *Or* hypertension that is diagnosed or present before ~20 weeks gestation
   f. *Or* hypertension that is diagnosed for the first time in pregnancy that does not resolve postpartum
   g. See Table 1 (page 5) for ACOG definitions hypertensive disorders
   h. See discussion below regarding degree and timing of hypertension required to confirm diagnosis

References:
3. **Chronic hypertension with superimposed preeclampsia:**
   
i. Preeclampsia complicating pre-existing chronic hypertension
   
j. *Or* preeclampsia in a woman with a history of hypertension before pregnancy
   
k. *Or* preeclampsia in a woman with a history of hypertension before ~20 weeks gestation
   
l. This may be further classified as chronic hypertension with superimposed preeclampsia with severe features or chronic hypertension with superimposed preeclampsia without severe features.

4. **Gestational hypertension:**
   
m. Systolic blood pressure of $\geq 140$ mmHg or diastolic blood pressure of $\geq 90$ mmHg, or both, on 2 occasions at least 4 hours apart after 20 weeks gestation, in a woman with previously normal blood pressure.
   
n. *And* absence of any severe features of preeclampsia (See Box 3, page 4)

Hypertension in pregnancy is a multisystem, dynamic process that requires timely recognition, accurate diagnosis and close surveillance. It is one the leading causes of maternal morbidity perinatal mortality worldwide.
Table 1. American College of Obstetricians and Gynecologists Definitions of Hypertensive Disorders

<table>
<thead>
<tr>
<th>Disorder</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hypertension in pregnancy</td>
<td>Systolic blood pressure $\geq 140$ mmHg or diastolic $\geq 90$ mmHg, or both, measured on two occasions at least 4 hours apart</td>
</tr>
<tr>
<td>Severe-range hypertension</td>
<td>Systolic blood pressure $\geq 160$ mmHg or diastolic $\geq 110$ mmHg, or both, measured on two occasions at least 4 hours apart</td>
</tr>
<tr>
<td>Chronic hypertension</td>
<td>Hypertension diagnosed or present before pregnancy or before 20 weeks of gestation; or hypertension that is diagnosed for the first time during pregnancy and that does not resolve it the postpartum period</td>
</tr>
<tr>
<td>Chronic hypertension with superimposed pre eclampsia</td>
<td>Preeclampsia in a woman with a history of hypertension before pregnancy or before 20 weeks of gestation</td>
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</table>

**1. Preeclampsia**

**Definition**

**Blood pressure:**

- Systolic blood pressure $\geq 140$ mmHg or diastolic $\geq 90$ mmHg, or both, on 2 occasions at least 4 hours apart after 20 weeks' gestation in a woman with a previously normal blood pressure
- Systolic blood pressure $\geq 160$ mmHg or diastolic $\geq 110$ mmHg, or both, can be 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 this amount extrapolated from a time collection)
- Or protein/creatinine ratio greater than or equal to 0.3 (each measured mg/dL)
- Or dipstick reading of 1+ (used only 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/microliter)
- Renal insufficiency (serum creatinine concentration 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
- Cerebral or visual disturbances unresponsive to medication and not accounted for by alternative diagnosis
1a. Preeclampsia with severe features

Definition
Any single finding below is diagnostic of preeclampsia with severe features (See Box 3, page 4)

- Systolic blood pressure 160 mmHg or higher, or diastolic blood pressure of 110 mmHg or higher, or both, on two occasions at least 4 hours apart (unless antihypertensive therapy is initiated before this time)
- Thrombocytopenia (platelet count less than 100,000/microliter)
- Impaired liver function as indicated by abnormally elevated blood concentrations of liver enzyme (to twice laboratory normal concentration), severe persistent right upper quadrant or epigastric pain unresponsive to medication and not accounted for by alternative diagnosis
- Renal insufficiency (serum creatinine greater than 1.1 mg/dL or doubling of serum creatinine concentration in the absence of other renal disease)
- Pulmonary edema
- New-onset cerebral or visual disturbances unresponsive to medication and not accounted for by alternate diagnosis

1b. Preeclampsia without severe features

Definition
Blood pressure:
- Greater than or equal to 140 mmHg systolic or greater than or equal to 90 mmHg diastolic, or both, on 2 occasions at least 4 hours apart after 20 weeks' gestation in a woman with a previously normal blood pressure

AND

Proteinuria:
- Greater than or equal to 300 mg per 24 hour urine collection (or this amount extrapolated from a time collection)
- Or protein/creatinine ratio greater than or equal to 0.3 (each measured mg/dL)
- Or dipstick reading of 1+ (used only if other quantitative methods are not available)

AND WITHOUT AFOREMENTIONED SEVERE FEATURES (SEE BOX 3, page 4)

1c. HELLP Syndrome

Definition:
A subset of preeclampsia that includes hemolysis, elevated liver enzymes and 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
The clinical course with HELLP syndrome is typically characterized by progressive and often sudden deterioration in the maternal and fetal status.

1d. Eclampsia

**Definition:**
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.

2. Chronic Hypertension

**Definition:**
Hypertension that is diagnosed present before pregnancy or present before ~20 weeks’ gestation or diagnosed for the first time in pregnancy that does not resolve postpartum.

The American College of Cardiology (ACC) and the American Heart Association (AHA) revised criteria for diagnosing hypertension adults was published in 2018. These recommendations include for categories of

- Normal—systolic blood pressure less than 120 mmHg and diastolic blood pressure less than 80 mmHg
- Elevated—systolic blood pressure of 120-129 mmHg and diastolic blood pressure of less than 80 mmHg
- Stage I hypertension—systolic blood pressure of 130 to 139 mmHg or diastolic blood pressure of 80-89 mmHg
- Stage II hypertension—systolic blood pressure of 140 mmHg or more or diastolic blood pressure of 90 mmHg or more

Patients diagnosed with chronic hypertension (stage 1 or greater) outside of pregnancy should be managed as a chronic hypertensive for the purposes of pregnancy.

The management of patients without a prior diagnosis of chronic hypertension that have blood pressure in the stage I hypertension range before 20 weeks gestation is unclear. However, "a conservative approach of a higher degree of observation may be warranted" as these patients do have a higher risk of preeclampsia, gestational diabetes and indicated preterm birth. Logistically, managing these patients as having suspected chronic hypertension for the purposes of pregnancy is a reasonable approach. Postpartum confirmation of this diagnosis is recommended. Admittedly, this approach may mislabel some women with "borderline and possibly inconsequential cases of blood pressure elevation" as abnormal. Alternatively, it may avoid unindicated preterm delivery while allowing for earlier diagnosis of progressive disease.

The assumption that the 20-week mark can discriminate chronic hypertension from pregnancy related hypertension is not well substantiated in the medical literature. As
such, "the 20-week convention should not be used dogmatically but rather for orientation while maintaining clinical judgment."

"The uncertainty of the new approach to hypertension from the ACC/AHA as applied to the care of pregnant women should be an active area of investigation."

ACOG has also defined hypertensive disorders. (See Table 1, page 5)

References:

3. Chronic Hypertension with Superimposed Preeclampsia

Definition:
Superimposed preeclampsia refers to patients with chronic hypertension who develop preeclampsia. Distinguishing superimposed preeclampsia from benign gestational increases in blood pressure and proteinuria can be quite challenging.

Given the higher risk of adverse pregnancy outcome in patients with superimposed preeclampsia, vigilance in diagnosis is recommended to avoid catastrophic maternal and fetal outcomes.

Thus "in cases of diagnostic uncertainty and discriminating transient blood pressure increases and chronic hypertension from superimposed preeclampsia, particularly with severe range blood pressures, initial surveillance in a hospital setting is recommended."

Clinicians should be aware that there is considerable ambiguity in the diagnosis of superimposed preeclampsia.

For the purposes of classification there are two subsets of superimposed preeclampsia. These include a superimposed preeclampsia with severe features and superimposed preeclampsia without severe features. This is similar to the classification system for preeclampsia (i.e., preeclampsia with severe features or preeclampsia without severe features).

3a. Chronic Hypertension with Superimposed Preeclampsia with Severe Features

Definition:
Superimposed preeclampsia with severe features is a subset of superimposed preeclampsia.

Superimposed preeclampsia with severe features is likely when any of the systemic findings exist:
• Severe range blood pressure despite escalation of antihypertensive medication
• Thrombocytopenia (platelet count less than 100,000/ microliter)
• Elevated liver transaminases (greater than or equal to 2 times the upper normal limits for the reference laboratory)
• New onset or worsening renal insufficiency
• Pulmonary edema
• Persistent cerebral or visual disturbances

3b. Chronic Hypertension with Superimposed Preeclampsia without Severe Features

Definition:
Superimposed preeclampsia without severe features is a subset of superimposed preeclampsia.

Chronic hypertension with superimposed preeclampsia is likely when any of the following exist:
• A sudden increase in blood pressure that was previously well controlled or escalation of antihypertensive medication to control blood pressure
• New-onset proteinuria or sudden increase in proteinuria in a woman with known proteinuria before or early in pregnancy

AND WITHOUT AFOREMENTIONED SYSTEMIC FINDINGS

4. Gestational Hypertension

Definition:
Gestational hypertension is defined as new onset of blood pressure elevation after 20 weeks' gestation in the absence of accompanying proteinuria or aforementioned systemic findings.

An important distinction exists for patients with severe, persistent range elevations in blood pressures (≥ 160 mmHg systolic or ≥ 110 mmHg diastolic) with absent proteinuria. Patients with severe, persistent range elevated blood pressures with absent proteinuria carry the diagnosis of preeclampsia with severe features and not gestational hypertension.

II. Management of Preeclampsia/Gestational Hypertension/Chronic Hypertension with Superimposed Preeclampsia

Delivery is the only cure for the disease. The decision for immediate delivery versus expectant management is dependent upon:
1. Rate and severity of disease progression
2. Gestational age
3. Maternal and fetal condition

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Updated 2/18/2020
Maternal assessment:
Frequent ongoing maternal assessments are required to assess for severity and progression of disease.
1. Laboratory assessment:
   • CBC
   • Creatinine
   • AST, ALT
   • 24-hour urine protein and creatinine clearance
   • Consider protein/creatinine ratio, urinalysis, uric acid, lactate dehydrogenase, total bilirubin, peripheral blood smear and coagulation profile to clarify diagnosis
2. Symptom assessment:
   • New-onset cerebral or visual disturbances
   • Shortness of breath
   • Right upper quadrant pain
3. Physical exam assessment:
   • Right upper quadrant tenderness
   • Pulmonary exam
   • Edema
4. Maternal assessments should be repeated frequently as clinically indicated.
5. Outpatient expectant management, if deemed appropriate in cases of preeclampsia without severe features should include twice-weekly maternal assessments.
6. Close maternal-fetal monitoring by a physician/nurse are advised during treatment of acute-onset severe hypertension.
7. No cardiac monitoring required.
8. Expectant management of preeclampsia is reasonable in certain circumstances. However, delivery after maternal stabilization is recommended in the presence of uncontrolled severe hypertension, eclampsia, pulmonary edema, disseminated intravascular coagulation, new or increasing renal insufficiency, placental abruption or abnormal fetal testing.

Accurate blood pressure to optimally manage hypertension or pregnancy is necessary.
   • Standardized BP monitoring should be in place regardless arm size/shape
     Gold standard: manual sphygmomanometer, however, validated calibrated equivalent automated equipment may be used.
   • Patient has rested preferably for 10 minutes or more
     Patient is seated with legs uncrossed and back supported
     Patient has not used caffeine for tobacco for at least 30 minutes before measurement
   • Patient’s arm is supported at the level of the right atrium
     Appropriate size cuff (length 1.5 times upper arm circumference or a cuff with a bladder that encircles at least 80% of the arm and a width of at least 40% of the arm circumference)
     ▶ For an arm circumference of 22 to 26 cm, the cuff should be small adult size; 12 x 22 cm
     ▶ For an arm circumference of 27 to 34 cm, the cuff should be an adult size: 16 x 30 cm
For an arm circumference of 35 to 44 cm, the cuff should be large adult size: 16 x 36 cm
For an arm circumference of 45 to 52 cm, the cuff should be adult thigh size: 16 x 42 cm
• Do not put patient on side or in reclined supine position to obtain lower readings.

Fetal assessment:
Frequent ongoing fetal assessments are required to assess for severity and progression of disease.
• **Inpatient expectant management** based upon gestational age at diagnosis is recommended for patients with preeclampsia with severe features, chronic hypertension with superimposed preeclampsia with severe features barring above contraindications. This should be accomplished at a tertiary care facility. Testing determined by severity 1-2x daily.
• **Outpatient expectant management** based upon gestational age at diagnosis can be considered for patients with preeclampsia without severe features, chronic hypertension with superimposed preeclampsia without severe features and gestational hypertension. At least 2x/week or as clinically indicated
• Assessment of fetal growth at the time of diagnosis and repeated as clinically indicated, approximately every 2 weeks.
• Fetal assessments should be repeated as clinically indicated.

**Magnesium Sulfate**

Intravenous magnesium sulfate to prevent eclampsia is recommended for all women with preeclampsia with severe features, HELLP syndrome and chronic hypertension with superimposed preeclampsia with severe features.

Intravenous magnesium sulfate to prevent eclampsia may be considered for women with preeclampsia without severe features, chronic hypertension with superimposed preeclampsia without severe features and gestational hypertension.

A loading dose of 4-6 over 20 minutes followed by maintenance therapy of 2 grams/hour is recommended.

Treatment is suggested for 24 hours post-delivery.

Frequent monitoring of respiratory rate, deep tendon reflexes, and state of consciousness must be carried out.

Intake and output should be strictly monitored. A Foley catheter with urometer may be required.

An ampule of calcium gluconate should be readily available.
Aspirin

Table 1. Clinical Risk Factors and Aspirin Use*

<table>
<thead>
<tr>
<th>Level of Risk</th>
<th>Risk Factors</th>
<th>Recommendation</th>
</tr>
</thead>
<tbody>
<tr>
<td>High†</td>
<td>• History of preeclampsia, especially when accompanied by an adverse outcome&lt;br&gt;• Multifetal gestation&lt;br&gt;• Chronic hypertension&lt;br&gt;• Type 1 or 2 diabetes&lt;br&gt;• Renal disease&lt;br&gt;• Autoimmune disease (ie, systemic lupus erythematosus, the antiphospholipid syndrome)</td>
<td>Recommend low-dose aspirin if the patient has one or more of these high-risk factors</td>
</tr>
<tr>
<td>Moderate†</td>
<td>• Nulliparity&lt;br&gt;• Obesity (body mass index greater than 30)&lt;br&gt;• Family history of preeclampsia (mother or sister)&lt;br&gt;• Sociodemographic characteristics (African American race, low socioeconomic status)&lt;br&gt;• Age 35 years or older&lt;br&gt;• Personal history factors (eg, low birth weight or small for gestational age, previous adverse pregnancy outcome, more than 10-year pregnancy interval)</td>
<td>Consider low-dose aspirin if the patient has more than one of these moderate-risk factors</td>
</tr>
<tr>
<td>Low</td>
<td>• Previous uncomplicated full-term delivery</td>
<td>Do not recommend low-dose aspirin</td>
</tr>
</tbody>
</table>

*Includes only risk factors that can be obtained from the patient’s medical history. Clinical measures, such as uterine artery Doppler ultrasonography, are not included.

†Single risk factors that are consistently associated with the greatest risk of preeclampsia. The preeclampsia incidence rate would be approximately 8% or more in a pregnant woman with one or more of these risk factors.

‡A combination of multiple moderate-risk factors may be used by clinicians to identify women at high risk of preeclampsia. These risk factors are independently associated with moderate risk of preeclampsia, some more consistently than others.

§Moderate-risk factors vary in their association with increased risk of preeclampsia.

Goal for Timing of 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 (e.g., lethal anomaly, extreme prematurity)
- Persistent reversed end-diastolic flow in the umbilical artery

Abbreviation: HELLP, hemolysis, elevated liver enzymes, and low platelet count

*In some cases, a course of antenatal steroids can be considered depending on gestational age and maternal severity of illness.


In the absence of contraindications, general guidelines for timing of delivery are presented below:

Preeclampsia without severe features:
- At diagnosis goal of 37 0/7 weeks

Preeclampsia with severe features:
- At diagnosis goal of 34 0/7 weeks

HELLP syndrome
- At diagnosis goal of 34 0/7 weeks
- At diagnosis prior to gestational age of fetal viability
- At diagnosis in the presence of disseminated intravascular coagulation, liver infarction or hemorrhage, renal failure, placental abruption or nonreassuring fetal status.
- Consider delay of delivery for 24-48 hours if maternal and fetal conditions remain stable to complete a course of corticosteroids for fetal benefits from the gestational age of fetal viability to 33 6/7 weeks. Delivery after completion of corticosteroids

Chronic hypertension on no medication
- 38 0/7-39 6/7 weeks of gestation

Chronic hypertension on medication
- 37 0/7-39 and 6/7 weeks of gestation

Chronic hypertension with superimposed preeclampsia with severe features
- At diagnosis after 34 0/7 weeks

Chronic hypertension with superimposed preeclampsia without severe features
- At diagnosis after 37 0/7 weeks

Gestational hypertension:
- At diagnosis after 37 0/7 weeks
Postpartum

Postpartum education prior to discharge should include information on signs and symptoms of severe hypertension with direction on when and where to access care.

Patients with severe hypertension should be assessed within 7 to 14 days of discharge or earlier as clinically indicated. Verification of follow-up should occur within the practice that provided prenatal care.

References:
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

IV HYDRAZINE
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

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

Hold IV Labetalol for maternal pulse under 60
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

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