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Maternal Safety Bundle
Severe Maternal Hypertension

Acknowledgements

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- The MSPQC Severe Maternal Hypertension team reviewed and modified these guidelines as part of a toolkit for all birthing facilities in Mississippi.
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Severe Hypertension in Pregnancy: Key Elements

Risk Assessment & Prevention

- Diagnostic Criteria
- When to Treat
- Agents to Use
- Monitoring

Readiness & Response

- Complications and Escalation Process
- Further Evaluation
- Change of Status
- Postpartum Surveillance

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Severe Hypertension

- Severe hypertension that is accurately measured using standard techniques and is persistent for > 15 minutes is considered a ***hypertensive emergency.***

Severe hypertension is defined as:
systolic blood pressure ≥ 160 mm Hg or
diastolic blood pressure ≥ 110 mm Hg

- Severe hypertension can occur during the antepartum, intrapartum, or postpartum period.

***Persistent hypertension is defined as:**
Two abnormal values 15-60 minutes apart = **Hypertensive Emergency**
(they do not have to be consecutive)

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Severe Hypertension Diagnosis & Treatment Algorithm

Severe Hypertension

A. **Abnormal Blood Pressure** (SBP ≥ 160 **or** DBP ≥ 110) → Repeat every 5 minutes for 15 minutes

*Notify physician or primary care provider if SBP ≥ 160 **or** DBP ≥ 110 for two measurements within 15 minutes.*

Persistent Hypertension

B. Defined as:

Two abnormal values 15-60 minutes apart = **Hypertensive Emergency**
(they do not have to be consecutive)

When to Treat

C. Treat should be initiated ASAP(preferably within 60 minutes from 2nd elevated value) if persistent for 15 minutes (may treat within 15 minutes if clinically indicated).

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Agents to Use: First Line

First line medications for the management of severe hypertension in pregnant and postpartum women are:

- Intravenous labetalol
- Intravenous hydralazine
- Oral nifedipine

Note: Magnesium Sulfate

- **Is <u>not</u> recommended as an antihypertensive agent**
- Remains the **drug of choice for seizure** prophylaxis and for **controlling seizures** in eclampsia
- Unless contraindicated, **should be given** when managing a hypertensive crisis
- IV bolus of 4-6 grams in 100 ml over 20 minutes followed by IV infusion of 1-2 grams per hour

- Continue for 12-24 hours postpartum according to clinical circumstances,
- *Stopping at less than 24 hours only if the patient is:*
  - *asymptomatic*
  - *diuresing well*
  - *having well-controlled BP*
  - *exhibiting no other complications*

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Algorithm: First Line Management with Labetalol*

SBP ≥ 160 or DBP ≥ 110 →

Notify a provider and institute fetal surveillance if viable → Labetalol 20 mg IV over 2 minutes → Repeat BP in 10 minutes → If SBP ≥ 160 or DBP ≥ 110, administer labetalol 40 mg IV over 2 minutes; if BP is below threshold, continue to monitor BP closely →

Repeat BP in 10 minutes → If SBP ≥ 160 or DBP ≥ 110, administer labetalol 80 mg IV over 2 minutes; if BP is below threshold, continue to monitor BP closely → Repeat BP in 10 minutes → If SBP ≥ 160 or DBP ≥ 110, administer labetalol 80 mg IV over 2 minutes; if BP is below threshold, continue to monitor BP closely →

If SBP ≥ 160 or DBP ≥ 110, administer **hydralazine** 10 mg IV over 2 minutes; if below threshold, continue to monitor BP closely → Repeat BP in 10 minutes and again in 20 minutes → If SBP ≥ 160 or DBP ≥ 110 at 20 minutes, obtain emergency consultation from specialist in MFM, internal medicine, anesthesiology, or critical care → Give additional antihypertensive medication per specific order as recommended by specialist →

Once BP thresholds are achieved, repeat BP
- 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

→ Institute additional BP monitoring per specific order

*Maximum cumulative IV administered doses should not exceed the following: hydralazine 25 mg; labetalol 220 mg in 24 hours.

Hold IV labetalol for maternal pulse under 60

10 mg of nifedipine can be given orally if intravenous access is unavailable (nifedipine is not recommended for sublingual use)

Algorithm: First Line Management with Hydralazine

SBP ≥ 160 or DBP ≥ 110 →

Notify a provider and institute fetal surveillance if viable →

Administer hydralazine 5 mg or 10 mg IV over 2 minutes →

Repeat BP in 10 minutes and again in 20 minutes →

If SBP ≥ 160 or DBP ≥ 110 at 20 minutes, administer hydralazine 10 mg IV over 2 minutes; if below threshold, continue to monitor BP closely →

Repeat BP in 10 minutes and again in 20 minutes →

If SBP ≥160 or DBP ≥ 110 at 20 minutes, administer **labetalol** 20 mg IV over 2 minutes; if below threshold, continue to monitor BP closely →

Repeat BP in 10 minutes →

If SBP ≥ 160 or DBP ≥ 110, administer labetalol 40 mg IV over 2 minutes and obtain emergency consultation from specialist in MFM, internal medicine, anesthesiology, or critical care →

Give additional antihypertensive medication per specific order as recommended by specialist →

Once BP thresholds are achieved, repeat BP
- 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

→ Institute additional BP monitoring per specific order

*Maximum cumulative IV administered doses should not exceed the following: hydralazine 25 mg; labetalol 220 mg in 24 hours.

10 mg of nifedipine can be given orally if intravenous access is unavailable (nifedipine is not recommended for sublingual use)

Algorithm: First Line Management with Oral Nifedipine*

SBP ≥ 160 or DBP ≥ 110
Present for ≥ 15 min

Notify a provider and institute fetal surveillance if viable

Administer Nifedipine capsule (10 mg orally)

Repeat BP in 20 minutes and record results

If either BP threshold is still exceeded administer Nifedipine capsule (20mg orally); if below threshold, continue to monitor BP closely

Repeat BP in 20 minutes and record results

If either BP threshold is exceeded at 20 minutes administer second 20mg dose Oral Nifedipine; if below threshold, continue to monitor BP closely

Repeat BP in 20 minutes and record results

If either BP threshold is still exceeded, administer labetalol (40 mg intravenously over 2 minutes) and obtain emergency consultation from maternal–fetal medicine, internal medicine, anesthesia, or critical care subspecialists.

Give additional antihypertensive medication per specific order

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,and then every hour for 4 hours.

Institute additional BP timing per specific order

*Oral Nifedipine not for sublingual use

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Agents to Use: No IV Access

If intravenous access is not yet obtained in a pregnant or postpartum woman with severe hypertension, administer:

- 200 mg of labetalol orally or
- 10 mg of nifedipine orally with swallow of water *(not for sublingual use)*
- Repeat in 30 minutes if systolic blood pressure remains ≥ 160 **or** diastolic blood pressure ≥ 110 and intravenous access still unavailable

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Agents to Use: Second Line

If the patient fails to respond to first line agents, recommend emergency consultation with a specialist in one of the following areas for second line management decisions:

- Maternal Fetal Medicine
- Internal Medicine
- Anesthesiology
- Critical Care
- Emergency Medicine

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Monitoring: Blood Pressure Management

Maternal

- Measure blood pressure every 10 minutes during administration of antihypertensive medications
- Once blood pressure is controlled (<160/110), measure blood pressure:
  - every 10 minutes for 1 hour
  - every 15 minutes for next hour
  - every 30 minutes for next hour
  - every hour for four hours
- Obtain baseline labs:
  - CBC, platelets, LDH, liver function tests, electrolytes, BUN creatinine, urine protein
  - Consider urine drug screen

Fetal

- Fetal monitoring surveillance as appropriate for gestational age
- Continuous EFM preferred if fetus is viable: exceeding 23-24 weeks gestational age

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Severe Hypertension in Pregnancy Checklist

[ ] Initiate magnesium sulfate for seizure prophylaxis (if not already initiated).

- [ ] Load 4-6 grams of 10% magnesium sulfate in 100 ml solution IV over 20 minutes
- [ ] Magnesium sulfate on infusion pump
- [ ] Magnesium sulfate and pump labeled
- [ ] Magnesium sulfate 10 grams of 50% solution IM (5 grams in each buttock) if no IV access
- [ ] Magnesium sulfate maintenance 1-2 g/hour continuous infusion

Contraindications: pulmonary edema, renal failure, myasthenia gravis

Antihypertensive medications

- Labetalol (20, 40, 80, 80 mg IV* over 2 minutes, escalating doses, repeat every 10 minutes or 200 mg orally if no IV access); avoid in asthma or heart failure, can cause neonatal bradycardia
- Hydralazine (5-10 mg IV* over 2 minutes, repeat in 20 minutes until target blood pressure is reached)
- Nifedipine (10, 20, 20 mg orally, escalating doses, repeat every 20 minutes)

Repeat blood pressure every 10 minutes during administration

* Maximum cumulative IV administered doses should not exceed 25 mg hydralazine; 220 mg labetalol in 24 hours.

If first line agents are unsuccessful, recommend emergency consultation with a specialist (e.g., MFM, internal medicine, OB anesthesiology, critical care, emergency medicine) for second line management decisions

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Severe Hypertension in Pregnancy Checklist

Trigger for initiating this checklist is a SBP ≥160 or DBP ≥110

- Anticonvulsant medications (for recurrent seizures or when magnesium is contraindicated):
  - Lorazepam/Ativan (2-4 mg IV x 1, may repeat x 1 after 10-15 minutes)
  - Diazepam/Valium (5-10 mg IV every 5-10 minutes to maximum dose 30 mg)
  - Keppra (500 mg IV or orally, may repeat in 12 hours); dose adjustment needed if renal impairment (moved up to third position)
  - Phenytoin (15-20 mg/kg IV x 1, may repeat 10 mg/kg IV after 20 minutes if no response); avoid with hypotension, may cause cardiac arrhythmias

- Antenatal corticosteroids if < 34 weeks of gestation→give first injection of IM betamethasone 12mg IM promptly if applicable

[ ] Re-address VTE prophylaxis requirement

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Severe Hypertension in Pregnancy Checklist

Trigger for initiating this checklist is a SBP ≥160 or DBP ≥110

[ ] After stabilization, plan brain imaging studies (MRI preferable, otherwise CT without contrast) if:

- unremitting headache
- focal signs and symptoms
- uncontrolled high blood pressure
- lethargy
- confusion
- seizures
- abnormal neurologic examination

Postpartum:

- Antihypertensive therapy is suggested for women with persistent postpartum hypertension, SBP of 150 mm Hg or DBP of 100 mm or higher on at least two occasions that are at least 4 hours apart. Persistent SBP of 160 mm Hg or DBP of 110 mm Hg or higher should be treated promptly, preferably within 1 hour.

- Blood pressure monitoring is recommended 72 hours after delivery and/or outpatient surveillance (e.g., visiting nurse evaluation) within 3 days and again 7-10 days after delivery or earlier if persistent symptoms

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Eclampsia Checklist

[ ] Call for assistance (Hospital should identify Rapid Response Team) to location of the event
[ ] Check in:
    OB Attendings/ Fellows/Residents
    Three RNs
    Anesthesia
    Neonatology (if indicated)
[ ] Appoint a leader
[ ] Appoint a recorder
[ ] Appoint a primary RN and secondary personnel
[ ] Protect airway
[ ] Secure patient in bed, rails up on bed, padding
[ ] Lateral decubitus position
[ ] Maternal pulse oximetry
[ ] IV access/draw preeclampsia labs
[ ] Supplement oxygen (100% non-rebreather)
[ ] Bag-mask ventilation on the unit
[ ] Suction available
[ ] Continuous fetal monitoring (if appropriate)
[ ] Betamethasone 12 mg IM promptly if gestational age is <34 weeks, repeat in 12 hours
[ ] Consider transfer of patient after stabilization to higher level of maternal or neonatal care

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Eclampsia Checklist

Initial Medications

[ ] Load 4-6 grams of 10% magnesium sulfate in 100 ml solution IV over 20 minutes
[ ] Magnesium sulfate on infusion pump
[ ] Magnesium sulfate and pump labeled
[ ] Magnesium sulfate 10 grams of 50% solution IM (5 grams in each buttock) if no IV access
[ ] Magnesium sulfate maintenance 1-2 g/hour continuous infusion
Contraindications: pulmonary edema, renal failure (serum creatinine >1.2 mg/dL), myasthenia gravis

Anticonvulsant medications

(for recurrent seizures or when magnesium sulfate is contraindicated):

- Lorazepam/Atavan (2-4 mg IV x 1, may repeat x 1 after 10-15 minutes)
- Diazepam/Valium (5-10 mg IV every 5-10 minutes to maximum dose 30 mg)

- Keppra (500 mg IV or orally, may repeat in 12 hours); dose adjustment needed if renal impairment
- Phenytoin (15-20 mg/kg IV x 1, may repeat 10 mg/kg IV after 20 minutes if no response); avoid with hypotension, may cause cardiac arrhythmias

Eclampsia Checklist

Persistent Seizure (recurrent seizure while receiving magnesium sulfate at therapeutic levels)

[ ] Neuromuscular block and intubate

[ ] Obtain radiographic imaging (MRI preferred, CT without contrast if MRI not possible)

[ ] ICU admission

[ ] Consider transfer of care to higher level of maternal care

Antihypertensive medications *SBP ≥160 or DBP ≥110*

Labetalol (20, 40, 80, 80 mg IV* over 2 minutes, escalating doses, repeat every 10 minutes or 200 mg orally if no IV access); avoid in asthma or heart failure, can cause neonatal bradycardia

Hydralazine (5-10 mg IV* over 2 minutes, repeat in 20 minutes until target blood pressure is reached)

Repeat blood pressure every 10 minutes during administration

* Maximum cumulative IV administered doses should not exceed 25 mg hydralazine; 220 mg labetalol in 24 hours.

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Eclampsia Checklist

After Seizure

[ ] Assess neurologic status every 15 minutes until patient's mental status normalizes with alert sensorium and absence of localizing findings

[ ] Preeclampsia labs: CBC, Chem 7, LFT, Uric Acid, LDH, T&S, PT/PTT, Fibrinogen, Magnesium, urine drug screen

[ ] Foley catheter (Hourly I&O. Report output <30 ml/hour)

Strict I&O (no less than every 2 hours). Report urine output to the clinician if <30 ml/hr.

(Foley catheter should be placed if urine output is borderline or strict I&O cannot be maintained. Urometer should be utilized if the urine output is borderline or <30 ml/hr.)

Delivery plan

[ ] Betamethasone 12 mg IM promptly if <34 weeks and not already given

[ ] Ensure that there is an appropriate plan for delivery

[ ] *Consider maternal transfer to higher level of care for neonates ≤ 35weeks who may require a NICU*

Magnesium Toxicity (magnesium level >8.0 mg/dL with absent patellar reflexes)

[ ] Stop Magnesium maintenance

[ ] Calcium gluconate 1 gram (10 ml of 10% solution) IV over 1-2 minutes

Postpartum

[ ] Oral antihypertensive medication postpartum if > 150/100

[ ] Blood pressure monitoring is recommended 72 hours after delivery and/or outpatient surveillance (e.g., visiting nurse evaluation) within 3 days and again 7-10 days after delivery or earlier if persistent symptoms.

[ ] Debrief

[ ] Document after debrief with the whole team

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Complications & Escalation Process

Maternal (pregnant or postpartum)

- CNS (seizure, unremitting headache, visual disturbance)
- Pulmonary edema or cyanosis
- Epigastric or right upper quadrant pain
- Impaired liver function (twice normal AST and/or ALT)
- Thrombocytopenia
- Hemolysis (schistocytes, twice normal LDH)
- Coagulopathy
- Oliguria*(<30mL per hour over 4 hours)

Fetal

Persistently abnormal fetal tracing (category 2 or 3)

IUGR (<5th centile)

Severe oligohydramnios (single deepest pocket <2cms)

Persistently abnormal umbilical Dopplers, especially absent end diastolic flow

Prompt Evaluation and Communication *(if undelivered, plan for delivery)*

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Further Evaluation

4 Types of Hypertension Defined

1. Chronic hypertension *(of any cause)*

- SBP ≥ 140 **or** DBP ≥ 90
- Prepregnancy or < 20 weeks

2. Gestational hypertension

- SBP ≥ 140 **or** DBP ≥ 90
- > 20 weeks
- Absence of proteinuria or systemic signs or symptoms

Severe gestational hypertension if SBP ≥ 160 **or** DBP ≥ 90

3. Chronic hypertension with superimposed preeclampsia

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Further Evaluation

4 Types of Hypertension Defined

4. Preeclampsia-eclampsia

- SBP ≥ 140 **or** DBP ≥ 90
- Proteinuria with or without signs/symptoms
- No proteinuria but, with signs, symptoms or lab abnormalities
- Proteinuria is not required for diagnosis of preeclampsia **or** eclampsia
- Seizure in setting of preeclampsia

Severe features of preeclampsia

- SBP ≥ 160 **or** DBP ≥ 110 on 2 occasions, 4 hours apart
- Persistent oliguria < 500 ml/24-hour
- Progressive renal insufficiency
- Unremitting headache/visual disturbances
- Pulmonary edema
- Epigastric/RUQ pain
- LFTs > 2x normal
- Platelets < 100K
- HELLP syndrome
- Severe persistent (>24hrs) oligohydramnios

(5 grams of proteinuria is no longer a criteria for severe preeclampsia)

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Monitoring: Change of Status

Once the pregnant patient with severe hypertension is stabilized, consider:

- Magnesium sulfate for seizure prophylaxis if not already initiated
- Timing, location and route for delivery
  - In cases of eclampsia, recommend delivery after stabilization
  - Consider if patient should be transferred to higher level of maternal/neonatal care

  Vaginal delivery is preferred if thought to be attainable in reasonable amount of time in most cases of HELLP syndrome, severe preeclampsia, and chronic hypertension with superimposed preeclampsia
  - If ≥ 34 weeks, deliver
- Use of antenatal corticosteroids and subsequent pharmacotherapy if preterm (<34 weeks), also if expectant management planned

  For women with HELLP syndrome from the gestational age of fetal viability to 33 6/7 weeks of gestation, it is suggested that delivery be delayed for 24-48 hours **if** maternal and fetal condition remains stable.

  Contraindications to a delay in delivery for the fetal benefit of corticosteroids: uncontrolled hypertension, *complicated eclampsia**, pulmonary edema, suspected abruptio placenta, disseminated intravascular coagulation, nonreassuring fetal status, and intrauterine fetal demise. **Complicated eclampsia includes patients having recurrent seizures, suspected CNS bleed, failure of sensorium to improve*

  Continuing control of maternal blood pressure at high normal levels (140-150/90-100) with oral labetalol 200mg tid (if alert) or oral nifedipine 10mg tid (if alert)

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Guidelines for Documentation

On admission, document complete history and complete physical examination including any symptoms associated with preeclampsia

- ✓ Include symptoms of unremitting headaches, visual changes, epigastric pain, fetal activity, vaginal bleeding
- ✓ Baseline BPs over the course of the pregnancy
- ✓ Any medications/drugs taken during the pregnancy (including illicit and OTC)
- ✓ Current vital signs, including oxygen saturation
- ✓ Current and past fetal assessment (including FHR monitoring results, estimated fetal weight, and BPP, as appropriate)
- ✓ *The physician's thought process if any change in the guidelines is undertaken*

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Guidelines for Documentation

- In documentation of assessment and plan, include:
  - ✓ Whether a diagnosis of preeclampsia has been made and, if not, what steps are being taken to exclude the diagnosis or assign a diagnosis of another hypertensive disorder of pregnancy
  - ✓ Whether antihypertensive medications are required to control BP and, if so, medication, dose, route, and frequency
  - ✓ Current fetal status
  - ✓ Whether magnesium sulfate is being initiated for seizure prophylaxis and if so, dosing, route, and duration of therapy
  - ✓ Whether delivery is indicated and if so, timing, method, and route. If delivery is not indicated, document under what circumstances it would be indicated
  - ✓ Antenatal corticosteroids if < 34 weeks of gestation
  - ✓ *Was transfer to a higher level of maternal or neonatal care considered, requested or declined?*
- Ongoing assessment and documentation should be every 30 minutes until the patient is stabilized with blood pressures below the trigger SBP of 160 or DBP of 110

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Postpartum Surveillance: Inpatient

Once a hypertensive emergency is treated and the patient is delivered, additional monitoring, follow-up, and education is necessary to prevent additional morbidity.

- Preeclampsia and eclampsia can develop postpartum
- Blood pressure should be measured every 4 hours after delivery until stable.
- Nonsteroidal anti-inflammatory agents (such as high doses of Motrin) may increase blood pressure in some patients and should not be used in women with elevated blood pressure
- Patient should not be discharged until blood pressure is well controlled (SBP $\leq$ 150 and DBP $\leq$ 100)for at least 24 hours
- Blood pressure peaks 2-6 days after delivery so discharge planning should include repeat blood pressure measurements as outpatient and a review of the signs and symptoms that should prompt the patient to seek medical care

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Post-Discharge Evaluation: Elevated BP at home, in office, in triage

Postpartum triggers:
- SBP ≥ 160 or DBP ≥ 110 or
- SBP ≥ 140-159 or DBP ≥ 90-109 with any of the following:
  - unremitting headaches
  - visual disturbances
  - epigastric/RUQ pain

↓

Emergency Department treatment (with OB /MICU consultation as needed); antihypertensive therapy is suggested for women with persistent postpartum hypertension, SBP ≥ 150 or DBP ≥ 100 on at least two occasions that are at least 4 hours apart. Persistent SBP ≥ 160 or DBP ≥ 110 should be treated within 1 hour.

↓

Good response to antihypertensive treatment and asymptomatic

↓

Admit for further observation and management (e.g., 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 with a specialist (e.g., MFM, internal medicine, OB anesthesiology, critical care)

Discharge Information & Planning: Postpartum Patients without Preeclampsia

- All patients get a patient information sheet describing in lay terms the signs and symptoms of preeclampsia
- All new nursing and physician staff receive an information sheet regarding hypertension in pregnancy and postpartum

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Discharge Information & Planning: Postpartum Patients with a Diagnosis of Preeclampsia

- Patients get a patient information sheet describing in lay terms the signs and symptoms of preeclampsia as well as the importance of prompt reporting of this information to their health care provider
- Inpatient or Outpatient Blood pressure monitoring is recommended for the first 3 postpartum days and should be re-evaluated again within 5-10 days or earlier if persistent symptoms.

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Emergency Department: Postpartum Preeclampsia Checklist

Triage patients less than 6 weeks postpartum as follows:

[ ] Core evaluation and assessment

[ ] If BP ≥ 160/110 **OR** 140/90 with:

- Unremitting headaches
- Visual disturbance
- Epigastric pain

[ ] Begin stabilization

[ ] Call for Obstetric consult immediately

[ ] OBS contact documented

[ ] Call MFM/MICU consult immediately for refractory blood pressure

[ ] Labs should include:

- CBC
- PT, PTT
- Electrolyte panel (potassium, sodium)
- Fibrinogen
- CMP
- Uric Acid
- Liver function panel (AST, bilirubin, LDH)
- Type and Screen
- Urine drug screen

[ ] Initiate Intravenous Access

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Emergency Department: Postpartum Preeclampsia Checklist

[ ] Assess neurologic status
- LOC/arousal/orientation/behavior
- Deep tendon reflexes
- Speech

[ ] Assess vital signs including oxygen saturation/pulse oximetry

[ ] Assess complaints and report; unremitting headaches, epigastric pain, visual disturbances, speech difficulties, lateralizing neuro signs, shortness of breath, difficulty breathing

[ ] Place Foley catheter

[ ] Strict I&O report output less than *30 ml/hr for 4 hours*

[ ] Plan brain imaging studies (MRI preferred, CT with/without contrast if MRI unavailable) if:
- Unremitting headache
- Focal signs and symptoms
- Uncontrolled high blood pressure
- Lethargy
- Confusion
- Seizures
- Abnormal neurologic examination

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Emergency Department: Postpartum Preeclampsia Checklist

Initial medications

[ ] Load 4-6 grams of 10% magnesium sulfate in 100 ml solution IV over 20 minutes
[ ] Magnesium sulfate on infusion pump
[ ] Magnesium sulfate and pump labeled
[ ] Magnesium sulfate 10 grams of 50% solution IM (5 grams in each buttock) if no IV access
[ ] Magnesium sulfate maintenance 1-2 g/hour continuous infusion

Contraindications: pulmonary edema, renal failure (serum creatinine >1.2mg/dL), myasthenia gravis

If magnesium sulfate is contraindicated:
Keppra 500 mg PO or IV every 12 hours

Antihypertensive medications *(see relevant algorithm in intrapartum section)*

- Labetalol (20, 40, 80, 80 mg IV* over 2 minutes, escalating doses, repeat every 10 minutes or 200 mg orally if no IV access); avoid in asthma or heart failure, can cause neonatal bradycardia
- Hydralazine (5-10 mg IV* over 2 minutes, repeat in 20 minutes until target blood pressure is reached)
- Nifedipine (10, 20, 20 mg orally, escalating doses, repeat every 20
- Repeat blood pressure every 10 minutes during administration

* Maximum cumulative IV administered doses should not exceed 25 mg hydralazine; 220 mg labetalol in 24 hours.

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Conclusion

- Risk reduction and successful, safe clinical outcomes for women with preeclampsia, eclampsia, or chronic hypertension with superimposed preeclampsia require avoidance and management of severe systolic and severe diastolic hypertension
- Increasing evidence indicates that standardization of care improves patient outcomes
- Systolic BP ≥ 160 mm Hg or diastolic BP ≥ 110 mm Hg warrant prompt evaluation at the bedside and treatment to decrease maternal morbidity and mortality
- Consider transfer of the severely ill pregnant/postpartum patient to a higher level of maternal care after stabilization and a safe transfer can be assured. Also consider maternal transfer after stabilization to a higher level of neonatal care if likely needed (<32 weeks, <1500g).

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