RECOMMENDATIONS FOR EVALUATION AND MANAGEMENT OF SEVERE HYPERTENSION IN PREGNANCY

Target Audience:
Clinicians (providers and nurses) who care for the perinatal patient

Scope/Patient Population:
Hypertensive disorders including preeclampsia complicate 12-22% of pregnancies worldwide and constitute one of the leading causes of maternal and perinatal morbidity and mortality, with an estimated 50,000-60,000 preeclampsia related deaths worldwide each year. (ACOG Task Force on Hypertension in Pregnancy, 2013; Druzin, Shields, Peterson, & Cape, 2013). In the United States, it is estimated that for every death, there are 50-100 "near miss" events that stop short of death but are associated with significant maternal morbidity. (Druzin et al., 2013). The incidence of preeclampsia has increased by 25% in the United States over the past two decades. (ACOG Task Force on Hypertension in Pregnancy, 2013).

This guideline is based on updated recommendations that are endorsed by many national bodies including the American College of Obstetricians and Gynecologists, the American Academy of Neurology, the American Society of Hypertension, the Preeclampsia Foundation, the California Medical Quality Care Collaborative, and the Society for Maternal-Fetal Medicine.

Scope/Patient Population/Inclusion and Exclusion Criteria:
Perinatal patients who present to the primary care offices, labor and delivery departments, urgent care centers and emergency departments.

Rationale:
By treating severe range blood pressures within the recommended time frame (within 60 minutes of confirmed severe range blood pressure) severe morbidity, ICU admissions, and mortality (eclampsia, hemorrhage, stroke, death) would be prevented.

Objective
Antihypertensive treatment initiation within 60 minutes of confirmed severe range blood pressure would prevent hemorrhage, abruption, stroke and death; this treatment follows best practice guidelines for best outcomes in the preeclamptic patient promoting better outcomes, vaginal/expectant delivery when blood pressures are normalized, cutting the cost of emergent/cesarean

	delivery and resources required to initiate delivery emergently. This will in turn, decrease cost of care, surgical complications and length of stay.
	Recommendations: **Patients presenting with severe hypertension will be evaluated and treated in a manner consistent with current standard of care:** A. Patients presenting with severe hypertension will be evaluated for fetal and maternal stability 1. Severe hypertension will be confirmed within 30 minutes of diagnosis a. Correct technique will be used to check blood pressure. This includes use of: and appropriate cuff size (length 1.5 times the upper arm circumference or a cuff with a bladder that encircles 80% or more of the arm); and the patient should be in an upright or semi-fowlers position; blood pressure should be measured after the patient's arm has rested at heart level for five minutes (National High Blood Pressure Work Group, 2000) 2. Patients at or beyond the point of fetal viability will have continuous monitoring of the fetus until maternal status is stabilized 3. Pregnant patients will be evaluated for severe features of preeclampsia, including: a. Headache b. Visual changes c. Right upper quadrant or epigastric pain d. Pulmonary edema e. Thrombocytopenia f. Elevated liver enzymes (exceeding twice the upper limit of normal) g. Renal insufficiency (creatinine > 1.1) B. Pregnant or postpartum patients will receive magnesium sulfate for seizure prophylaxis in appropriate cases. 1. Please see the MHS policy on magnesium sulfate policy 2. Magnesium sulfate should not be considered an antihypertensive. 3. Note: magnesium sulfate may be given intramuscularly if unable to establish IV access within the targeted time for administration. Dose 10 grams in divided doses, deep IM (gluteal). 4. Note: Magnesium administration should be started only after return of serum creatinine results. If creatinine ≥ 1.1, use renal dosing of 2 grams loading dose and 1 gram per hour infusion. **II. Pregnant and postpartum patients presenting with severe hypertension will receive treatment of their hypertension within 60 minutes of confirmation of severe hypertension.** A. Pregnant patients with preterm pregnancies should be assessed for antenatal steroid administration in anticipation of preterm delivery.

B. Pregnant patients presenting initially to the emergency department will be transferred to labor and delivery to facilitate timely and appropriate care.
C. Some pregnant patients presenting with severe hypertension may require intensive care unit admission.
    1. This decision should be made on a case-by-case basis.
D. Appropriate first-line treatment regimens for severe hypertension in pregnancy (American College of Obstetrics and Gynecology Committee on Obstetric Practice, 2015):
    1. IV Labetalol: 20 mg IV over 2 minutes (initial dose) administered in escalating doses every 10 minutes
        a. Suggested dosing schedule: 20mg, 40mg, 80mg
        b. The typical maximum dose is 300 mg in a 24 hour period; higher doses may be used in select patients with ongoing monitoring.
        c. Most patients who will respond will have at least a partial response by the 80mg dose.
        d. Discontinue labetalol and begin hydralazine if patient develops bradycardia (HR< 60) and requires additional antihypertensive therapies.
        e. Contraindications: Hypersensitivity to labetalol, symptomatic asthma, heart block greater than 1st degree (except in patients with pacemaker), severe bradycardias, uncompensated heart failure, cardiogenic shock and persistent hypotension, heart disease and congestive heart failure are relative contraindications (Lexicomp, 2016)]
        f. Parenteral labetalol should not be considered a first line agent in patients with asthma, heart disease, or congestive heart failure.
        g. May result in transient neonatal bradycardia
    2. IV hydralazine: administered in 5-10mg doses every 20 minutes for up to 2 doses in a 20 minute period.
        a. Maximum dose is 20mg in the first hour of treatment
        b. Additional doses may be repeated per physician order
        c. Associated with a risk of maternal hypotension and tachycardia
    3. Oral immediate-release nifedipine:
        a. 10 mg doses
        b. May repeat every 20 minutes for up to a total of three doses
        c. The capsule must not be pierced prior to administration
        d. Contraindications include a history of ischemic cardiac disease
        e. Can result in overshoot hypotension
    4. Magnesium sulfate should not be used as an antihypertensive in pregnant patients with severe hypertension.
E. Second-line treatment of hypertension could include a continuous infusion of an antihypertensive drug (American College of Obstetrics and Gynecology Committee on Obstetric Practice, 2015).
    1. Examples include nicardipine continuous infusion as well as labetalol continuous infusion.

	2. These agents often require intensive care unit admission. 3. Patients requiring intensive care unit admission and continuous antihypertensive infusion should be cared for by or in consultation with a physician with critical care experience. **III. Pregnant patients presenting with severe hypertension will be assessed for the appropriate level of care** A. Pregnant patients under 34 weeks gestational age (or the minimum gestational age for the facility-specific nursery) and preeclampsia with severe features will be transported to a facility that can provide appropriate care to the newborn after delivery. B. Delivery is indicated in patients ≥37 weeks gestation who have preeclampsia.
	Algorithms: *Protocols are illustrated at the end of this document.* • **Evaluation and Management of Severe Hypertension in Pregnancy** • **Eclampsia Algorithm** • **Evaluation and Treatment of Antepartum and Postpartum Preeclampsia in the Emergency Department**
	Evidence: 1. ACOG Task Force on Hypertension in Pregnancy. (2013, 2013). **Hypertension in Pregnancy.** 2. American College of Obstetrics and Gynecology Committee on Obstetric Practice. (2015). Committee Opinion: **Emergent Therapy for Acute-Onset Severe Hypertension During Pregnancy and the Postpartum Period.** 3. Druzin, M. L., Shields, L. E., Peterson, N. L., & Cape, V. (2013). Preeclampsia Toolkit: **Improving Health Care Response to Preeclampsia In C. M. Q. C. Collaborative (Ed.). California: CMQCC.** 4. National High Blood Pressure Education Program Working Group on High Blood Pressure in Pregnancy. (2000). **Report of the national high blood pressure education program working group on high blood pressure in pregnancy**. *Am J Obstet Gynecol*; 183:S1-S22.
	List of Implementation Items and Patient Education:

	• *Order Set* ○ OB C-SECTION PRE-OP AND PACU POC ORDER SET [11129] • *Audio Power Point (Education)* • *CBL* • *Grand Rounds Webinar* • *Poster presentation* • *Prenatal and postpartum patient education*
	Metrics Plan: *Four metrics for outcome measurement will be measured:* 1. *Time from first (initial) blood pressure meeting severe range criteria = 160 systolic or greater and/or 110 diastolic or greater to time of confirmed blood pressure meeting severe range criteria Goal: 15 minutes* 2. *Time from confirmed severe range blood pressure to time of medication order (Order Set or initial acceptable antihypertensive order acceptable)* 3. *Time from confirmed severe range blood pressure to time of antihypertensive drug administration* 4. *Use of Order Set "OB Supplemental Severe Hypertension Order Set 11257"* in patients with confirmed severe range blood pressure
	PDCA Plan: *The Women's Collaborative is responsible for continuing review of literature and modifying pathway as needed when new evidence is published or every 3 years, whichever comes sooner.*
	Point of Contact: *Preeclampsia Workgroup Leader(s)*

Approval By:	***Date of Approval:***
Collaborative (Women's)	*05/2016*
MHS/Other Committee (CIT)	*10/2016*
MCC/Collaborative Leadership	*10/2016*
Original Date:	*04/2016*
Revision Dates:	*06/2016; 09/2016: 2/2017*
Reviewed with no Changes Dates:	*X/XX; X/XX*

Distribution: MultiCare Connected Care + MultiCare Health System

Evaluation and Management of Severe Hypertension in Pregnancy (>23 w/gestation)

Confirmed SBP≥ 160 and/or DBP ≥ 110 Two blood pressures SBP≥ 160 and/or DBP ≥ 110 in 15 minutes

Evaluation

Consult OB Provider

Continuous EFM

Maternal VS

Assess for severe features of preeclampsia:

- Headache
- Visual changes
- RUQ or Epigastric pain
- Pulmonary Edema
- Thrombocytopenia
- Elevated LFTs
- Creatinine > 1.1*(renal dosing may be required)

(Severe hypertension and any one or more of the above features is diagnostic for preeclampsia)

Labs

- CBC
- CMP
- UA
- Urine protein to creatinine ratio

Yes

Stabilization
(Do not wait for complete laboratory evaluation)

IV access

Seizure Prophylaxis

Magnesium Sulfate
Bolus: 6 grams over 20 minutes followed by infusion: 2grams/hr. May give IM if no IV access. 10 grams in divided doses
See MHS Magnesium policy

*Anticipate lower dosages for patient with decreased renal function

Antihypertensive Medications

Nifedipine - PO
(consider first line if no IV or difficulty obtaining IV access)

Initial Dose:
10 mg orally

Additional doses:
10mg
May repeat every 20 minutes to a total of 3 doses

Labetalol - IVP
Maximum dose 300mg in first hour of treatment

Initial dose:
20 mg IV push over 2 minutes
Repeat BP in 10 minutes,
If systolic ≥ 160 or diastolic ≥ 110 give 40mg IV push over 2 minutes
Repeat BP in 10 minutes, If systolic ≥ 160 or diastolic ≥ 110, give 80mg IV push over 2 minutes
Repeat BP in 10 minutes,
If systolic ≥ 160 or diastolic ≥ 110, notify provider and either repeat 80mg dose or switch to other agent

Hydralazine – IVP
Maximum dose 20 mg in first hour of treatment

Initial dose:
5-10 mg IV push over 2 minutes
Repeat BP in 20 minutes,
If systolic ≥ 160 or diastolic ≥ 110, give 5-10mg IV push over 2 minutes
Repeat BP in 20 minutes
If systolic ≥ 160 or diastolic ≥ 110, notify provider and give additional antihypertensive as ordered

Disposition/Management

Transfer urgently to labor and delivery

Nursery appropriate for gestational age of infant?

Yes → Severe features present?

Yes → Consider delivery vs. betamethasone administration

No → Strongly consider maternal transport to Level III/IV facility

Goal [Antihypertensive treatment initiation within **60 minutes** of confirmed severe range BP]

Education Services (ILD)

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Eclampsia Treatment Algorithm

Seizure

Call for help
Rapid Response & Anesthesia

- Position patient in left lateral decubitus position
- Establish open airway and maintain breathing
- Check oxygen level (SpO2)
- Check blood pressure and pulse
- Obtain IV access
- Check blood sugar
- **FHT continuous (if pregnant)**

Magnesium Sulfate 6 gram loading dose over 20 minutes; followed by a 2 gram/hour maintenance dose if renal function is normal . If no IV access consider IM magnesium per policy.

Transfer to appropriate OB site.

Recurrent Seizure:

- Maintain airway and oxygenation
- Give a 2nd loading dose of magnesium sulfate **4 grams** over 20 minutes
- Observe for signs of magnesium toxicity

Recurrent Seizure after a 2nd loading dose of magnesium sulfate, *consider the following:

- Midazolam (Versed) 1-2 mg IV (can repeat in 5-10 minutes) OR
- Lorazepam (Ativan) 4 mg IV over 2 minutes (can repeat in 5-15 minutes to maximum of 8 mg in 12 hours) OR
- Diazepam (Valium) 5-10 mg IV slowly (can repeat every 15 minutes up to 30 mg) OR
- Phenytoin (Dilantin) 1000mg IV over 20 minutes
- Monitor respiration, B/P, and ECG and signs of magnesium toxicity. Phenytoin may cause QRS or QT prolongation

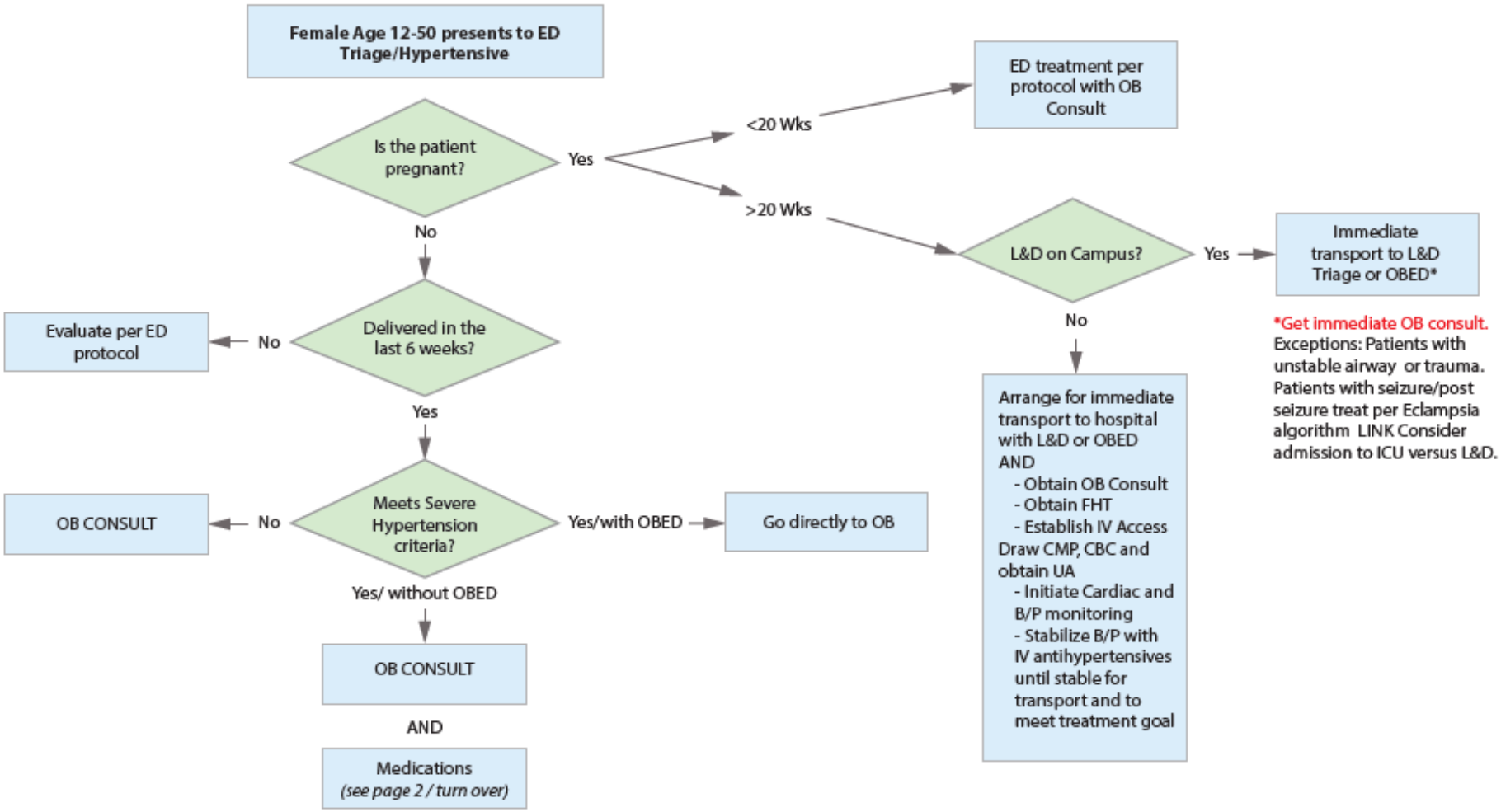
Resolution of seizures:

- Maintain magnesium infusion until 24 hours after the last seizure or after delivery whichever is later
- Assess for any signs of neurologic injury/focal deficit: head imaging should be considered if neurologic injury is suspected.
- Once the patient is stabilized preparations should be made for delivery: mode of delivery is dependent upon clinical circumstances surrounding the pregnancy

Discontinuation of therapy:
Severe preeclampsia and eclampsia: 24 hours after delivery or after last seizure

Education Services (ILD)

Evaluation and Treatment of Antepartum and Postpartum Preeclampsia in the Emergency Department



Goal [Antihypertensive treatment initiation within **60 minutes** of confirmed severe range BP: ≥160 Systolic &/OR ≥110 Diastolic. Treat as **HYPERTENSIVE CRISIS/EMERGENCY**]

Education Services (ILD)

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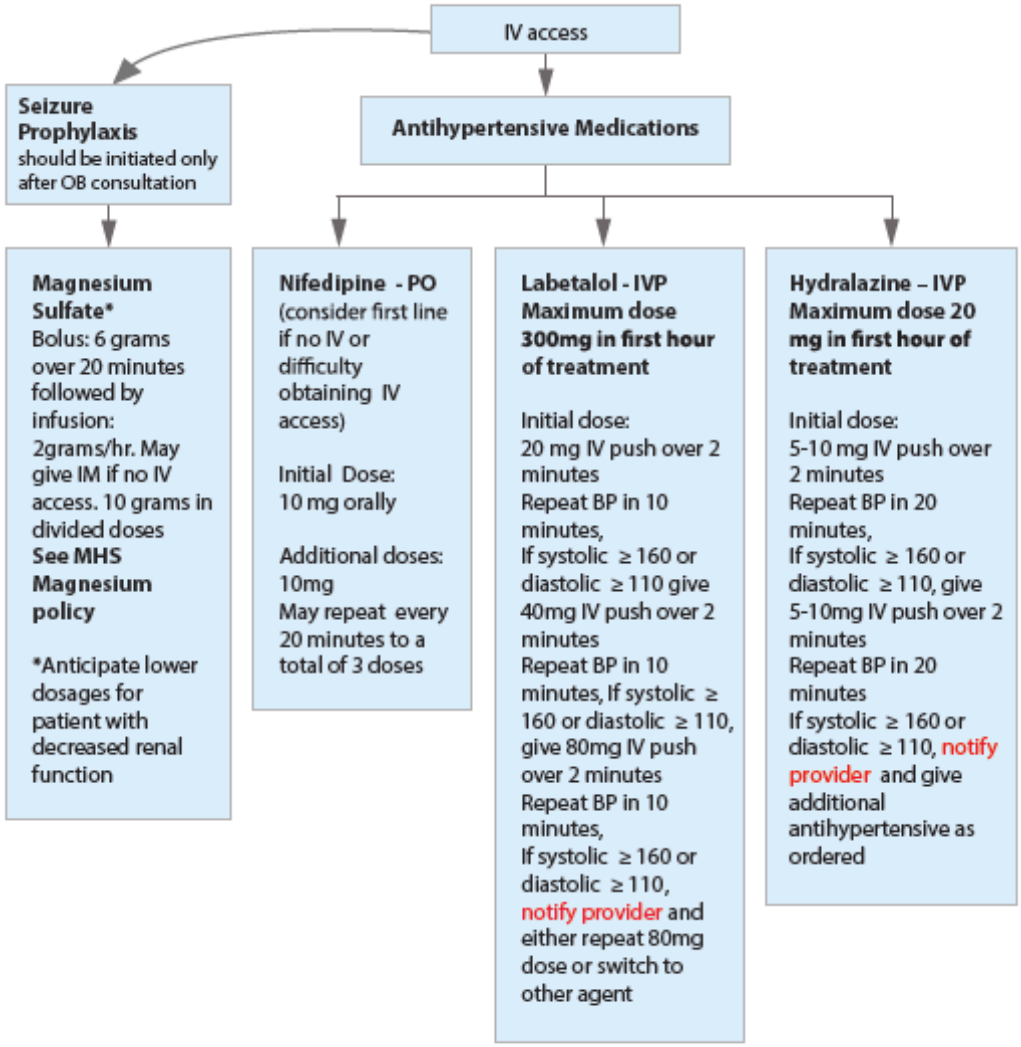
Evaluation and Treatment of Antepartum and Postpartum Preeclampsia in the Emergency Department



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