Driver 1: Readiness

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PREGNANCY-RELATED PROMPT OPTIMAL MANAGEMENT OF HYPERTENSION

Global Aim: Improve maternal health through hospital-facilitated timely recognition and treatment of hypertensive disorders of pregnancy during pregnancy and the postpartum period.

Primary Key Driver

Readiness: Implementation of standard protocols/processes

Secondary Drivers

- Develop standard protocols/processes for identification, management, and treatment of severe HTN
- Ensure rapid access to severe HTN medication
- Integrate a patient advisor in your QI team*

Respectful care is a universal component of every driver and activity

Develop standard protocols/processes for identification, management, and treatment of severe HTN

Potentially Better Practices:

1. **Standardized Protocol:** Implement protocols for early warning signs, diagnosis, and treatment of severe preeclampsia/eclampsia, including BP, lab, and fetal assessments.

2. **Timely Triage Process:** Ensure swift evaluation of pregnant/postpartum patients with severe hypertension.

3. **Escalation System**: Establish a plan for consultation, escalation, and maternal transfer.

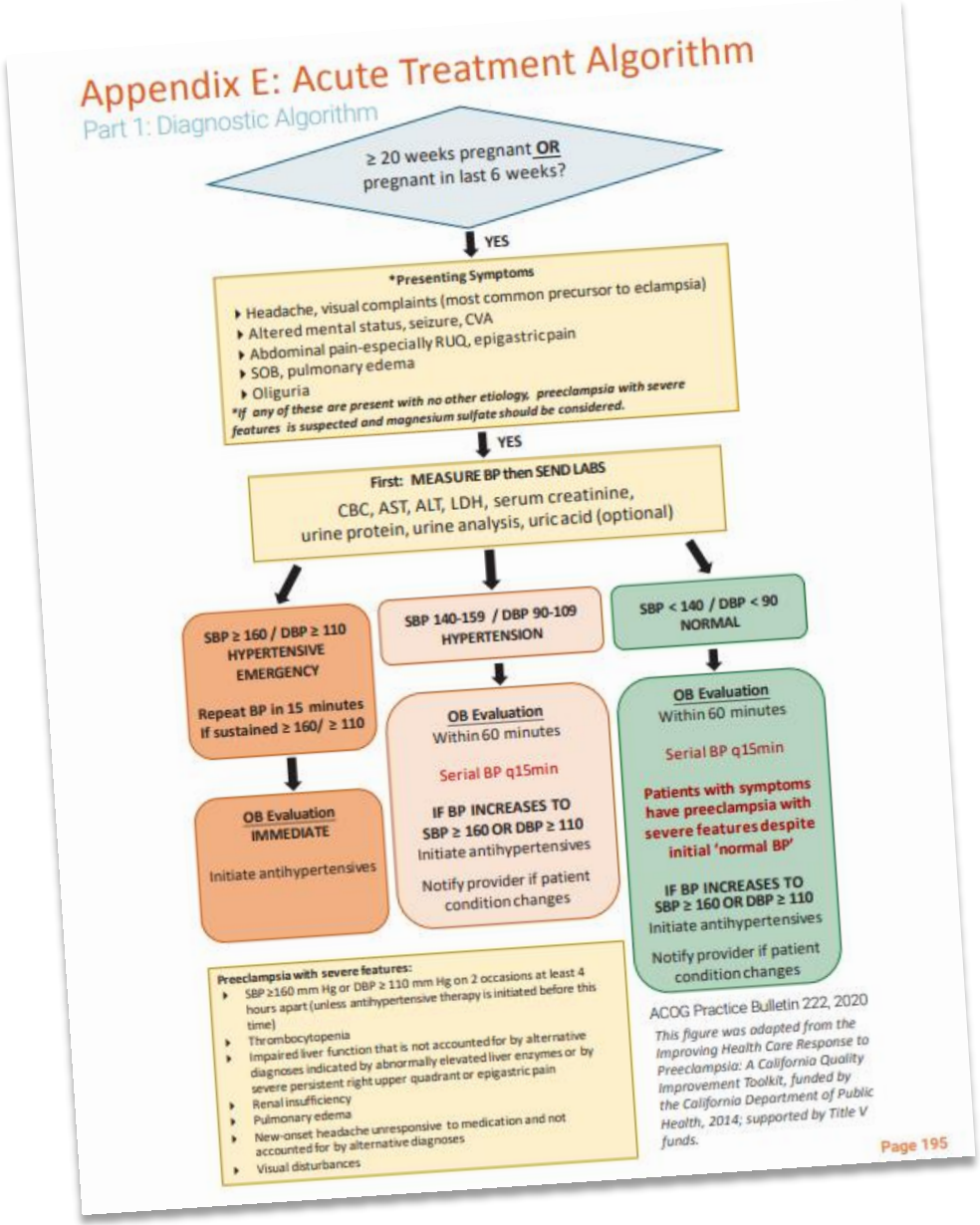
4. **Reference Algorithms:** Provide easy access to treatment algorithms for hypertension/preeclampsia across units.

5. **Align with ED/EMS:** Coordinate protocols with local emergency and EMS services.

Resource Examples

CMQCC Acute Treatment Algorithm

ACOG Checklists



Appendix E: Acute Treatment Algorithm

Part 1: Diagnostic Algorithm

≥ 20 weeks pregnant OR pregnant in last 6 weeks?

YES

***Presenting Symptoms**

- Headache, visual complaints (most common precursor to eclampsia)
- Altered mental status, seizure, CVA
- Abdominal pain-especially RUQ, epigastric pain
- SOB, pulmonary edema
- Oliguria

**If any of these are present with no other etiology, preeclampsia with severe features is suspected and magnesium sulfate should be considered.*

YES

First: MEASURE BP then SEND LABS

CBC, AST, ALT, LDH, serum creatinine, urine protein, urine analysis, uric acid (optional)

SBP ≥ 160 / DBP ≥ 110	SBP 140-159 / DBP 90-109	SBP < 140 / DBP < 90
HYPERTENSIVE EMERGENCY	HYPERTENSION	NORMAL
Repeat BP in 15 minutes If sustained ≥ 160/ ≥ 110	OB Evaluation Within 60 minutes	OB Evaluation Within 60 minutes
OB Evaluation IMMEDIATE	Serial BP q15min	Serial BP q15min
Initiate antihypertensives	IF BP INCREASES TO SBP ≥ 160 OR DBP ≥ 110 Initiate antihypertensives	Patients with symptoms have preeclampsia with severe features despite initial 'normal BP'
	Notify provider if patient condition changes	IF BP INCREASES TO SBP ≥ 160 OR DBP ≥ 110 Initiate antihypertensives
		Notify provider if patient condition changes

Preeclampsia with severe features:

- SBP ≥160 mm Hg or DBP ≥ 110 mm Hg on 2 occasions at least 4 hours apart (unless antihypertensive therapy is initiated before this time)
- Thrombocytopenia
- Impaired liver function that is not accounted for by alternative diagnoses indicated by abnormally elevated liver enzymes or by severe persistent right upper quadrant or epigastric pain
- Renal insufficiency
- Pulmonary edema
- New-onset headache unresponsive to medication and not accounted for by alternative diagnoses
- Visual disturbances

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This figure was adapted from the Improving Health Care Response to Preeclampsia: A California Quality Improvement Toolkit, funded by the California Department of Public Health, 2014; supported by Title V funds.

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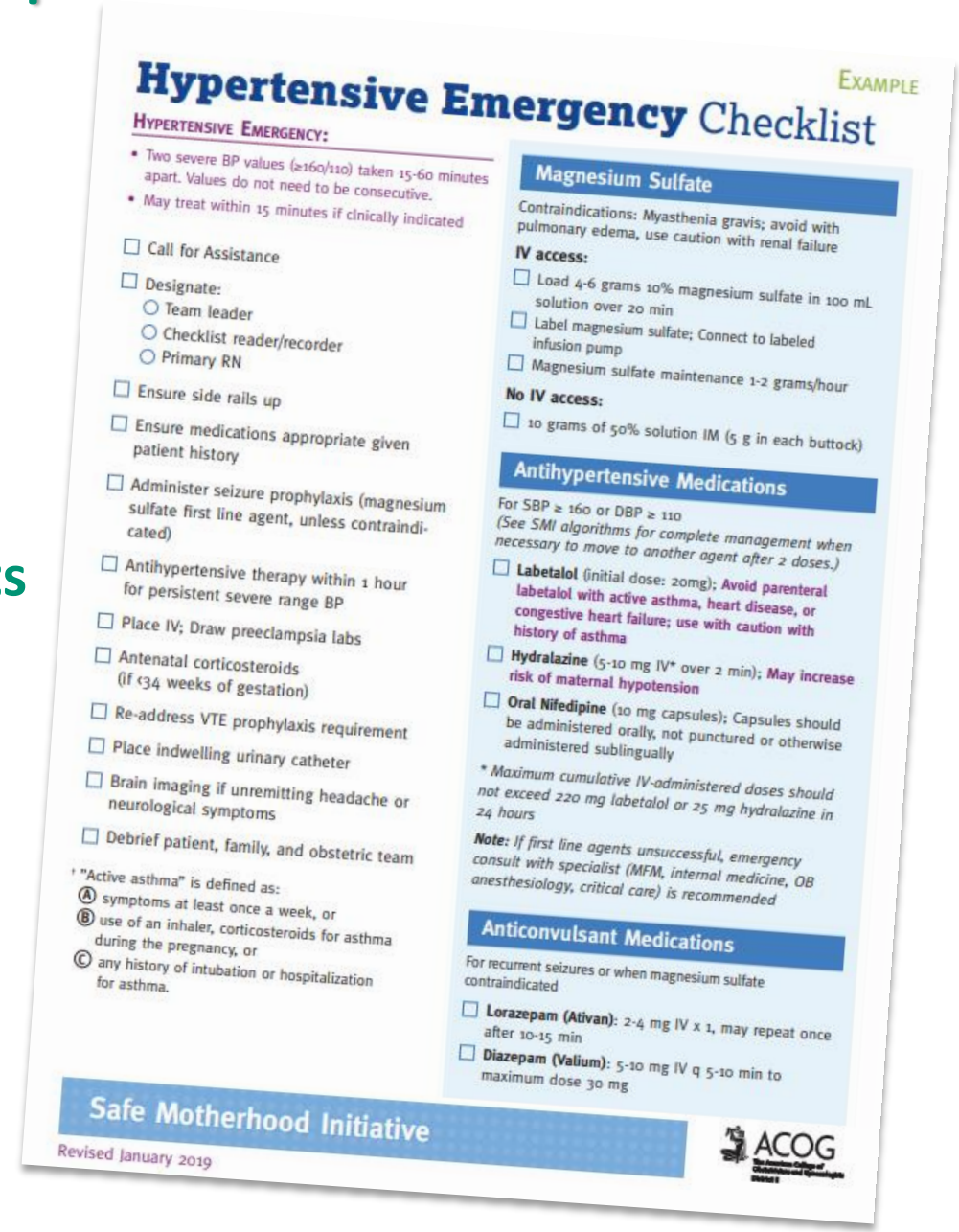


EXAMPLE

Hypertensive Emergency Checklist

HYPERTENSIVE EMERGENCY:

- Two severe BP values (≥160/110) taken 15-60 minutes apart. Values do not need to be consecutive.
- May treat within 15 minutes if clinically indicated

- ☐ Call for Assistance
- ☐ Designate:
  - ○ Team leader
  - ○ Checklist reader/recorder
  - ○ Primary RN
- ☐ Ensure side rails up
- ☐ Ensure medications appropriate given patient history
- ☐ Administer seizure prophylaxis (magnesium sulfate first line agent, unless contraindicated)
- ☐ Antihypertensive therapy within 1 hour for persistent severe range BP
- ☐ Place IV; Draw preeclampsia labs
- ☐ Antenatal corticosteroids (if <34 weeks of gestation)
- ☐ Re-address VTE prophylaxis requirement
- ☐ Place indwelling urinary catheter
- ☐ Brain imaging if unremitting headache or neurological symptoms
- ☐ Debrief patient, family, and obstetric team

† "Active asthma" is defined as:
Ⓐ symptoms at least once a week, or
Ⓑ use of an inhaler, corticosteroids for asthma during the pregnancy, or
Ⓒ any history of intubation or hospitalization for asthma.

Magnesium Sulfate

Contraindications: Myasthenia gravis; avoid with pulmonary edema, use caution with renal failure

IV access:

- ☐ Load 4-6 grams 10% magnesium sulfate in 100 mL solution over 20 min
- ☐ Label magnesium sulfate; Connect to labeled infusion pump
- ☐ Magnesium sulfate maintenance 1-2 grams/hour

No IV access:

- ☐ 10 grams of 50% solution IM (5 g in each buttock)

Antihypertensive Medications

For SBP ≥ 160 or DBP ≥ 110
(See SMI algorithms for complete management when necessary to move to another agent after 2 doses.)

- ☐ **Labetalol** (initial dose: 20mg); **Avoid parenteral labetalol with active asthma, heart disease, or congestive heart failure; use with caution with history of asthma**
- ☐ **Hydralazine** (5-10 mg IV* over 2 min); **May increase risk of maternal hypotension**
- ☐ **Oral Nifedipine** (10 mg capsules); Capsules should be administered orally, not punctured or otherwise administered sublingually

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

***Note:** If first line agents unsuccessful, emergency consult with specialist (MFM, internal medicine, OB anesthesiology, critical care) is recommended*

Anticonvulsant Medications

For recurrent seizures or when magnesium sulfate contraindicated

- ☐ **Lorazepam (Ativan)**: 2-4 mg IV x 1, may repeat once after 10-15 min
- ☐ **Diazepam (Valium)**: 5-10 mg IV q 5-10 min to maximum dose 30 mg

Safe Motherhood Initiative

Revised January 2019

ACOG

Ensure rapid access to severe HTN medication

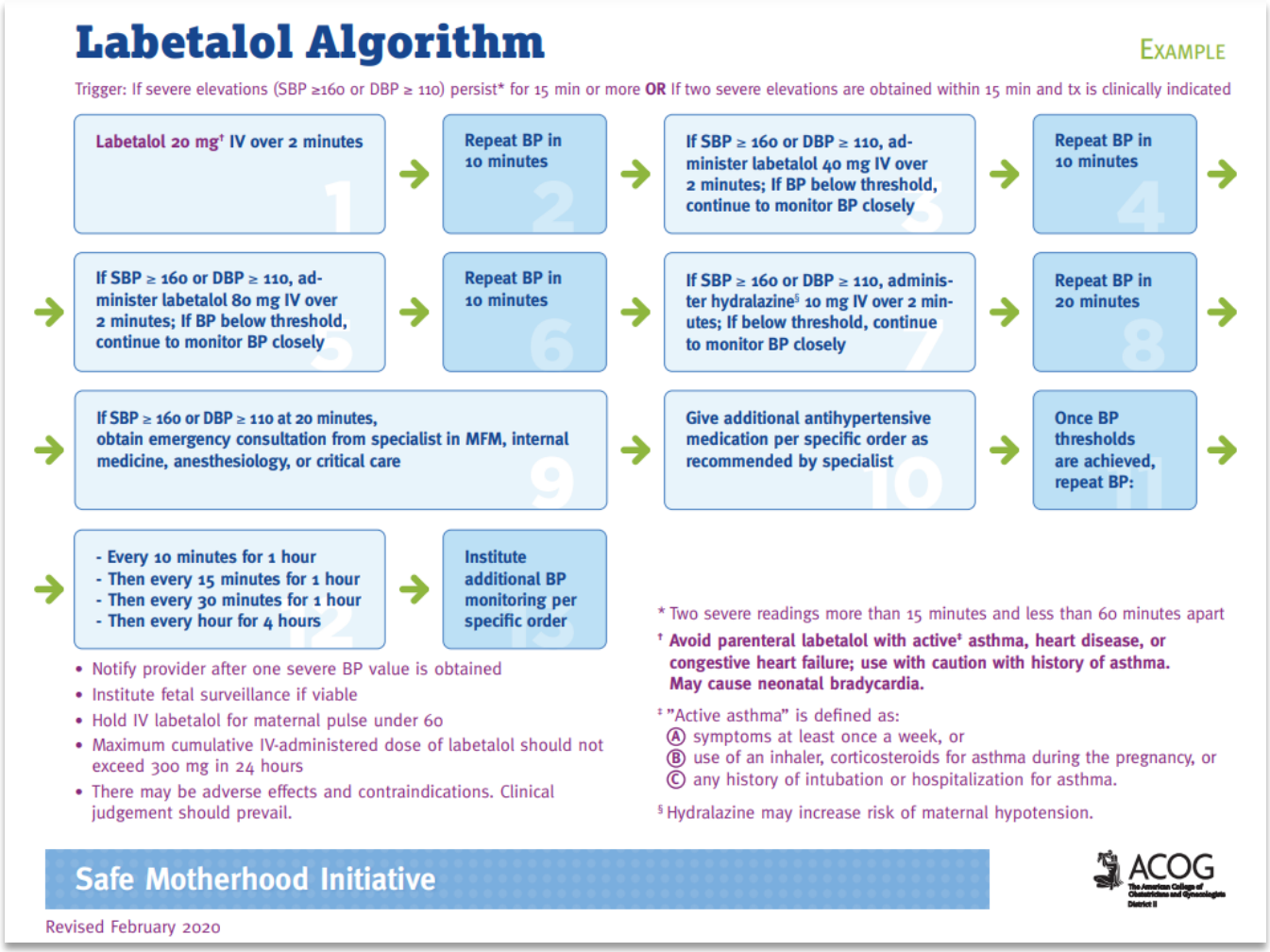
Potentially Better Practices:

1. **Key Medications Access:** Ensure rapid access to essential medications by clearly identifying their locations in all units (consider creating workflows).

2. **Dosage Instructions & Availability:** Provide easy access to dosage/administration instructions and regularly check medication availability.

3. **Standardize Order Sets:** Create or update standard order sets for hypertension/preeclampsia medications.

Resource Examples



Labetalol Algorithm

EXAMPLE

Trigger: If severe elevations (SBP ≥160 or DBP ≥ 110) persist* for 15 min or more **OR** If two severe elevations are obtained within 15 min and tx is clinically indicated

1. Labetalol 20 mg† IV over 2 minutes
2. Repeat BP in 10 minutes
3. If SBP ≥ 160 or DBP ≥ 110, administer labetalol 40 mg IV over 2 minutes; If BP below threshold, continue to monitor BP closely
4. Repeat BP in 10 minutes
5. If SBP ≥ 160 or DBP ≥ 110, administer labetalol 80 mg IV over 2 minutes; If BP below threshold, continue to monitor BP closely
6. Repeat BP in 10 minutes
7. If SBP ≥ 160 or DBP ≥ 110, administer hydralazine[§] 10 mg IV over 2 minutes; If below threshold, continue to monitor BP closely
8. Repeat BP in 20 minutes
9. If SBP ≥ 160 or DBP ≥ 110 at 20 minutes, obtain emergency consultation from specialist in MFM, internal medicine, anesthesiology, or critical care
10. Give additional antihypertensive medication per specific order as recommended by specialist
11. Once BP thresholds are achieved, repeat BP:
12. - 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
13. Institute additional BP monitoring per specific order

- Notify provider after one severe BP value is obtained
- Institute fetal surveillance if viable
- Hold IV labetalol for maternal pulse under 60
- Maximum cumulative IV-administered dose of labetalol should not exceed 300 mg in 24 hours
- There may be adverse effects and contraindications. Clinical judgement should prevail.

* Two severe readings more than 15 minutes and less than 60 minutes apart

† **Avoid parenteral labetalol with active‡ asthma, heart disease, or congestive heart failure; use with caution with history of asthma. May cause neonatal bradycardia.**

‡ "Active asthma" is defined as:
Ⓐ symptoms at least once a week, or
Ⓑ use of an inhaler, corticosteroids for asthma during the pregnancy, or
Ⓒ any history of intubation or hospitalization for asthma.

§ Hydralazine may increase risk of maternal hypotension.

Safe Motherhood Initiative

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Revised February 2020

ACOG Algorithms

- Labetalol
- Hydralazine
- Nifedipine

FPQC Sample Medication Kit

- Antihypertensive medications
- Seizure prophylaxis

FPQC

Integrate a patient advisor in your QI team

Potentially Better Practices:

1. **Community Collaboration:** Partner with local Healthy Start Coalition and community organizations to engage patients and families as hospital advisors.

2. **Patient Engagement Plan:** Develop a plan that includes recruitment, communication, orientation, and advisor expectations.