IN THE NAME OF GOD

Emergent Therapy for Severe Hypertension During Pregnancy and the Postpartum Period

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Definition and classification of hypertension in pregnancy

- The definition of hypertension in pregnancy is based only on office (or in-hospital) BP values] systolic BP (SBP) >_140 mmHg and/or DBP >_90 mmHg[

- distinguishes mildly (140–159/ 90–109 mmHg (
- or severely (>_ 160/110 mmHg) elevated BP

- in contrast to the grades used by the joint ESC/ESH Hypertension Guidelines.

SEVRE HYPERTENSION

Systolic blood pressure ≥ 160 mm Hg or
Diastolic blood pressure ≥ 110 mm Hg

There is no agreed definition of severe hypertension , with value ranging between
160-180 mmhg/>110 mmhg

HYPERTENSIVE EMERGENCY

Persistent, severe (>170 /110 mmhg) hypertension that can occur antepartum, intrapartum, or postpartum

Two severe BP values (≥ 160/110) taken 15-60 minutes apart
Severe values do not need to be consecutive

- If severe BP elevations persist for 15 min or more, begin treatment ASAP,preferably within 60 min of the second elevated value.

- If two severe BPs are obtained within 15 min, treatment may be initiated if clinically indicated

These conditions can occur in the second half of gestation in women not known to have chronic hypertension who develop sudden, severe hypertension)ie, with preeclampsia; gestational hypertension; or hemolysis ,elevated liver enzymes, and low platelet count [HELLP] syndrome ,(

but they also can occur among patients with chronic hypertension who are developing superimposed preeclampsia or a hypertensive exacerbation with acutely worsening, difficult to control, severe hypertension .

The degree of systolic hypertension (as opposed to the level of diastolic hypertension or relative increase or rate of increase of mean arterial pressure from baseline levels) may be the most important predictor of cerebral injury and infarction .

Endotracheal intubation is another risk of severe hypertension and is well known to increase BP sometimes to severe levels that require emergent therapeutic intervention Induction of general anesthesia and intubation should never be undertaken without first taking steps to eliminate or minimize the hypertensive response to intubation .

Treatment with first- line agents should be expeditious and occur as soon as possible within 30–60 minutes of confirmed severe hypertension to reduce the risk of maternal stroke.

Intravenous labetalol and hydralazine have long been considered first-line medications for the management of acute-onset, severe hypertension in pregnant women and women in the postpartum period .

Although relatively less information currently exists for the use of calcium channel blockers for this clinical indication, the available evidence suggests that immediate release oral nifedipine also may be considered as a first-line therapy, particularly when intravenous access is not available.

In the rare circumstance that intravenous bolus labetalol, hydralazine, or immediate release oral nifedipine fails to relieve acute-onset, severe hypertension and is given in successive appropriate doses, emergent consultation with an anesthesiologist, maternal–fetal medicine subspecialist, or critical care sub- specialist to discuss second-line intervention is recommended .

First line therapy

Intravenous labetalol

Intravenous hydralazine

Oral Nifedipine

The goal is not to normalize BP, but to achieve a range of 140–150/90–100 mm Hg in order to prevent repeated, prolonged exposure to severe systolic hypertension, with subsequent loss of cerebral vasculature autoregulation.

Close maternal and fetal monitoring by a physician and nursing staff are advised during the treatment of acute-onset, severe hypertension .

After initial stabilization, the team should monitor blood pressure closely and institute maintenance therapy as needed .

The use of IV labetalol, IV hydralazine, or immediate release oral nifedipine for the treatment of acute-onset, severe hypertension for pregnant or postpartum patients does not require cardiac monitoring .

Magnesium sulfate not recommended as antihypertensive agent

Should be used for: seizure prophylaxis and controlling seizures in eclampsia

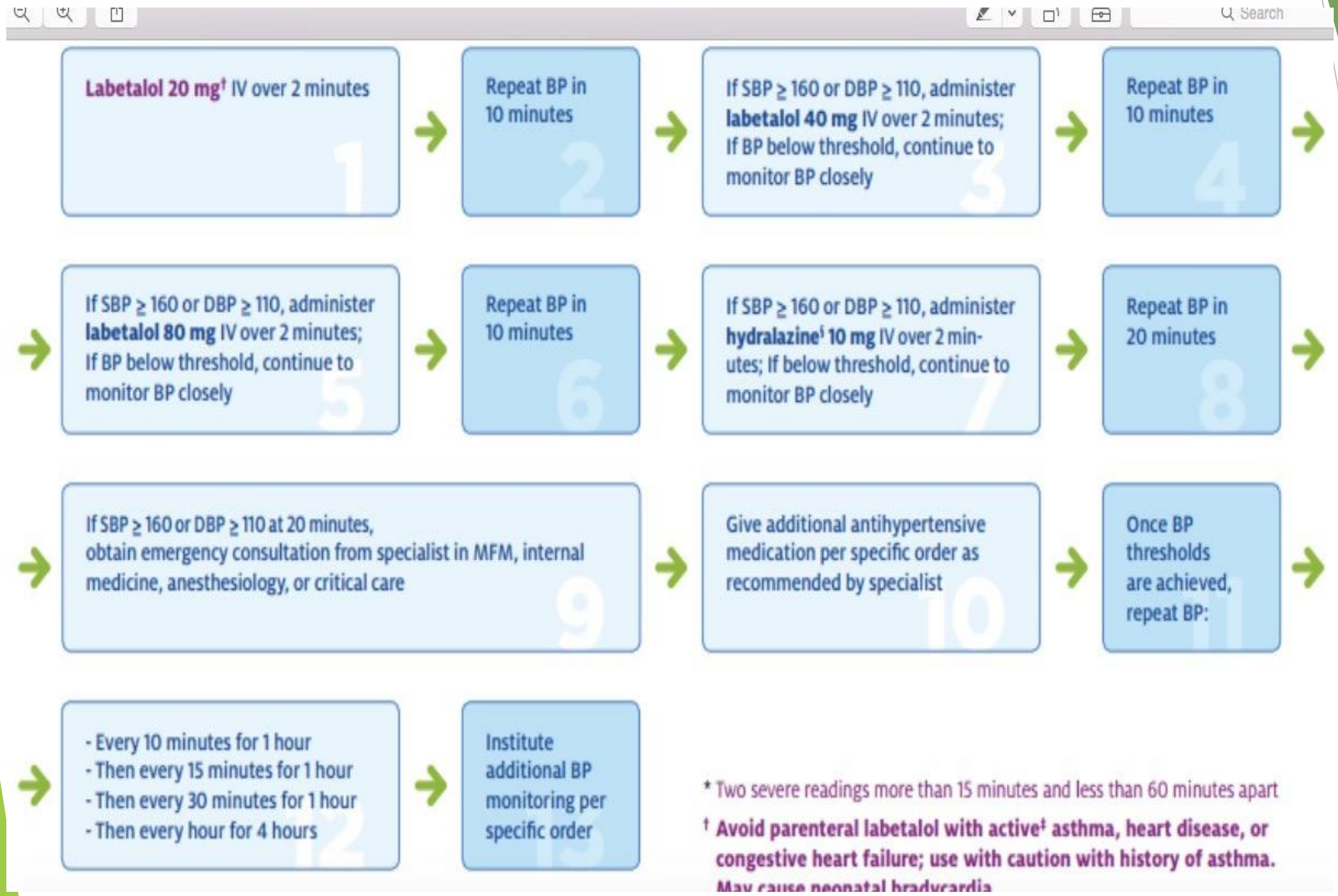
IV bolus of 4-6 grams in 100 ml over 20 minutes, followed by IV infusion of 1-2 grams per hour. Continue for 24 hours postpartum

If no IV access, 10 grams of 50% solution IM (5 g in each buttock(

Contraindications: pulmonary edema, renal failure, myasthenia gravis

Anticonvulsants (for recurrent seizures or when magnesium is C/I(

Starting magnesium should not be delayed in the setting of acute severe hypertension; it is recommended regardless of whether the patient has gestational hypertension with severe features, preeclampsia with severe features, or eclampsia



* 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**

Labetalol

20–10mg IV, then 20–80 mg every 20–30 min to a maximum dose of 300 mg

Or

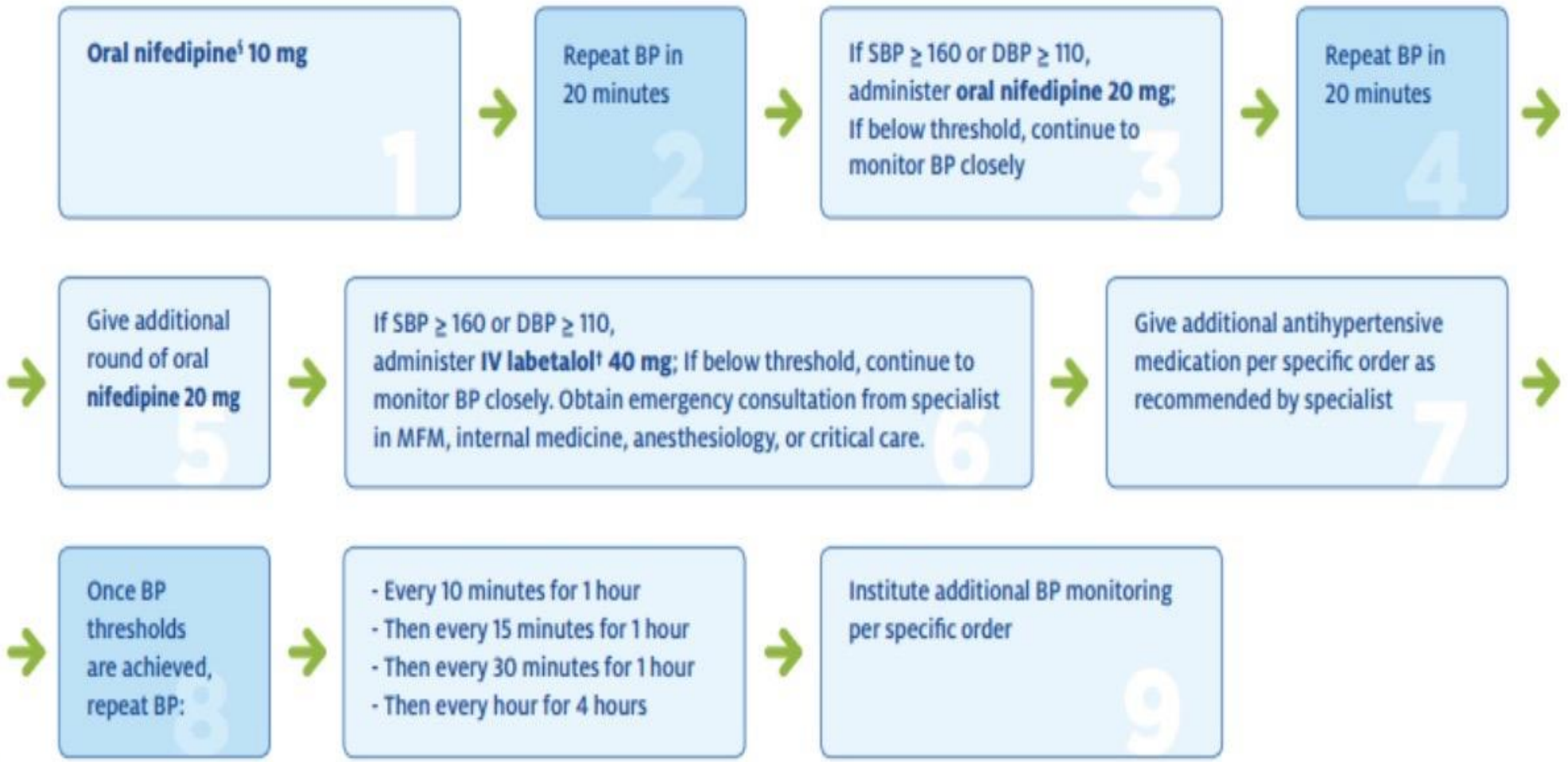
Constant infusion 1–2 mg/min IV

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. Administer **hydralazine† 5 mg or 10 mg** IV over 2 minutes
2. Repeat BP in 20 minutes
3. If SBP ≥ 160 or DBP ≥ 110, administer **hydralazine 10 mg** IV over 2 minutes
4. Repeat BP in 20 minutes
5. If SBP ≥ 160 or DBP ≥ 110, administer **labetalol 20 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 **labetalol 40 mg** IV over 2 minutes, and obtain emergency consultation from specialist in MFM, internal medicine, anesthesiology, or critical care
8. Give additional antihypertensive medication per specific order as recommended by specialist
9. Once BP thresholds are achieved, repeat BP:
10. - 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
11. Institute additional BP monitoring per specific order

- i.v. hydralazine is no longer the drug of choice as its use is associated with more perinatal adverse effects than other drugs.

- However, hydralazine is still commonly used when other treatment regimens have failed to achieve adequate BP control as most obstetricians find its side effect profile acceptable .


Oral nifedipine[i] 10 mg
1
Repeat BP in 20 minutes
2
If SBP ≥ 160 or DBP ≥ 110, administer oral nifedipine 20 mg; If below threshold, continue to monitor BP closely
3
Repeat BP in 20 minutes
4
Give additional round of oral nifedipine 20 mg
5
If SBP ≥ 160 or DBP ≥ 110, administer IV labetalol[i] 40 mg; If below threshold, continue to monitor BP closely. Obtain emergency consultation from specialist in MFM, internal medicine, anesthesiology, or critical care.
6
Give additional antihypertensive medication per specific order as recommended by specialist
7
Once BP thresholds are achieved, repeat BP:
8
- 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
9

Immediate release oral nifedipine capsules should be administered orally and not punctured or otherwise administered sublingually.

IF NO IV ACCESS AVAILABLE :

- Initiate oral nifedipine ,

- Oral labetalol, 200 mg

Repeat in 30 min if SBP remains ≥ 160 or DBP ≥ 110

Sodium nitroprusside for extreme emergencies

**Use for shortest amount of time due to cyanide/thiocyanate toxicity*

The drug of choice when preeclampsia is associated with pulmonary oedema is nitroglycerin (glyceryl trinitrate),given as an i.v.infusion of 5 lg/min,and gradually increased every 3–5min to a maximum dose of 100 lg

Although all three medications are appropriately used for the treatment of hypertensive emergencies in pregnancy, each agent can be associated with adverse effects.

Parenteral hydralazine may increase the risk of maternal hypotension

) systolic BP, 90 mm Hg or less (

Parenteral labetalol may cause neonatal bradycardia and should be avoided in women with asthma, heart disease, or congestive heart failure

Nifedipine has been associated with an increase in maternal heart rate, and less risk of overshoot hypotension

No significant changes in umbilical blood flow have been observed with the use of either labetalol or hydralazine

In the rare circumstance that IV bolus labetalol, hydralazine, or immediate release oral nifedipine fails to relieve acute-onset, severe hypertension second line alternatives to consider include nicardipine or esmolol by infusion pump

- Obtain baseline labs :

  - CBC
    - Platelets
    - LDH
    - Liver Function Tests

  - Electrolytes
    - BUN creatinine
    - Urine protein

ANTIHYPERTENSIVE THERAPY

• Recommended for persistent postpartum HTN: SBP ≥ 150 or DBP ≥ 100 on at least two occasions at least 4 hours apart

- Hypertension and lactation

- All antihypertensive agents taken by the nursing mother are excreted into breast milk.

- Most of the antihypertensive drugs are present at very low concentrations, except for propranolol and nifedipine, which have breast milk concentrations similar to those in maternal plasma.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