Pregnancy-Induced Hypertension (PIH)

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Based on AHA/ACC 2025 & UpToDate References

Definitions

- Pregnancy-induced hypertension (PIH): hypertension developing after 20 weeks gestation
- Includes gestational hypertension and preeclampsia
- Differentiate from chronic hypertension and superimposed preeclampsia

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Clinical Features – Hypertension

- New-onset hypertension after 20 weeks
- BP ≥140/90 mmHg on 2 occasions
- Severe: BP ≥160/110 mmHg

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Classification of Hypertensive Disorders

Condition	Definition
Chronic hypertension	Diagnosis prior to pregnancy or at <20 wks' gestation
Gestational hypertension	De novo hypertension at ≥20 wks' gestation in the absence of proteinuria or other signs of preeclampsia
Preeclampsia	Gestational hypertension with proteinuria or other maternal end-organ dysfunction including neurologic findings, pulmonary edema, hematologic findings, acute kidney injury, hepatic dysfunction (Section 5.5.2 "Preeclampsia and Eclampsia, Including Preeclampsia Superimposed on Chronic Hypertension")
Preeclampsia superimposed on chronic hypertension	Preeclampsia in a woman with a history of hypertension before pregnancy or before 20 weeks' gestation

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Gestational Hypertension

- Gestational hypertension should be suspected in a pregnant patient with **all** of the following :

- **New onset of hypertension** –SBP ≥140 mmHg and/or DBP ≥90 mmHg at ≥20 weeks of gestation. (at least two occasions, at least four hours apart).

- **Normal urine protein excretion for pregnancy** – Normal protein excretion in pregnancy is <300 mg per 24-hr urine

  or protein-to-creatinine ratio <0.3,

  or urine dipstick reading <2+ (if other quantitative methods are not available).

- **Absent signs and symptoms of end-organ dysfunction associated with preeclampsia with severe features** –

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Table 24. Diagnostic Criteria for Preeclampsia

Blood pressure	SBP ≥140 mm Hg or DBP ≥90 mm Hg on 2 occasions at least 4 h apart after 20 wks of gestation in a woman with previously normal BP *or* SBP ≥160 mm Hg or DBP ≥110 mm Hg (severe hypertension can be confirmed within a short interval [min] to facilitate timely antihypertensive therapy).
AND	
Proteinuria	≥300 mg per 24-h urine collection (or this amount extrapolated from a timed collection) *or* Protein/creatinine ratio ≥0.3 *or* Dipstick reading of 2+ (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 <100 × 10^9/L	
Renal insufficiency: Serum creatinine concentrations >1.1 mg/dL or a doubling of serum creatinine concentration in the absence of other renal disease	
Impaired liver function: Elevated blood concentration of liver transaminases to twice normal concentration	
Pulmonary edema	
New-onset headache unresponsive to medication and not accounted for by the alternative diagnoses or visual symptoms	

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Risk Factors

- First pregnancy, multiple gestation
- Advanced maternal age, obesity, diabetes
- Chronic kidney disease, preexisting hypertension
- Autoimmune diseases (SLE, antiphospholipid syndrome)

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RISK OF PROGRESSION TO PREECLAMPSIA

- Ten to 50 percent of patients diagnosed with gestational hypertension go on to develop preeclampsia in the next one to five weeks .

- It is unclear whether gestational hypertension and preeclampsia are independent diseases with a similar phenotype (hypertension) or if gestational hypertension is an early mild stage of preeclampsia.

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Management :

- **BLOOD PRESSURES ≥160/110 MMHG :**

  REFER TO ADMIT

- **BLOOD PRESSURES <160/110 MMHG :**

- Blood pressure measurements once or twice weekly
- Home blood pressure monitoring
- Urine protein-to-creatinine ratio
- Platelet count
- Serum creatinine
- Alanine transaminase, aspartate transaminase

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WHEN TO INITIATE ANTIHYPERTENSIVE THERAPY IN PREGNANCY

- All patients with severe hypertension :

Refer to admit for IV therapy

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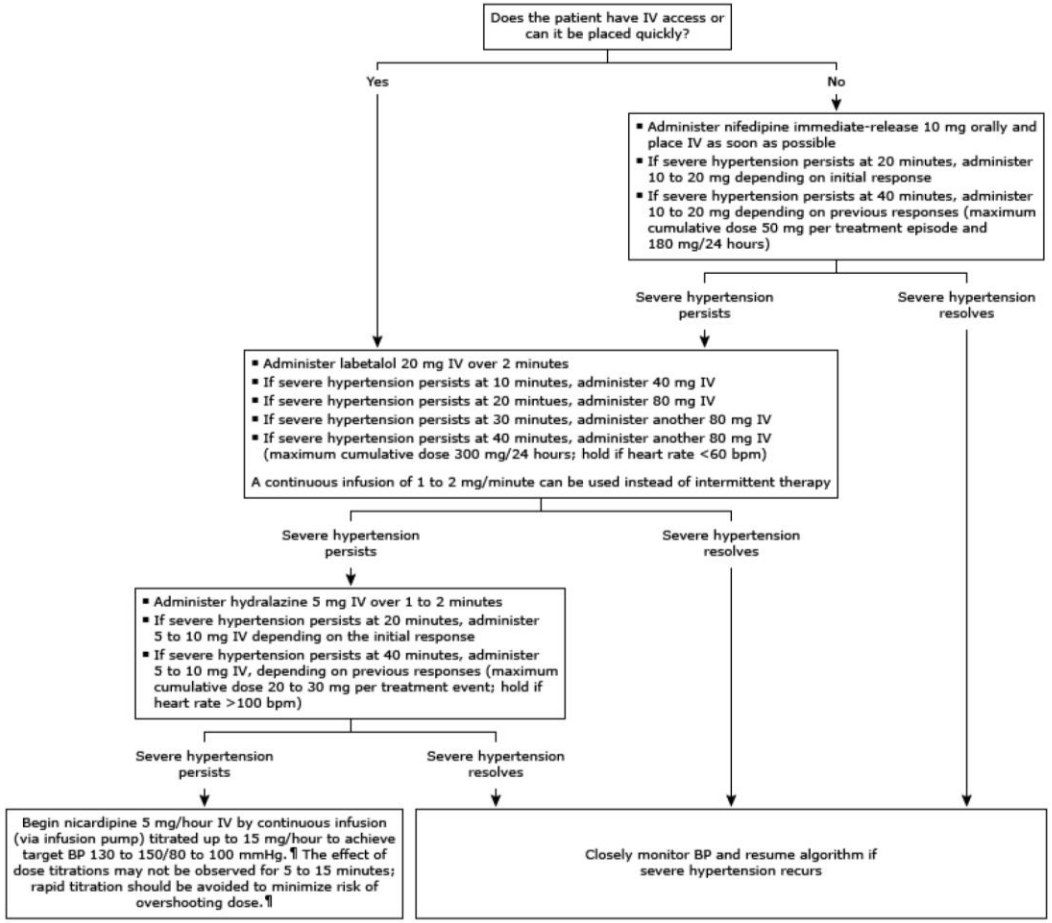
ACUTE THERAPY OF SEVERE HYPERTENSION



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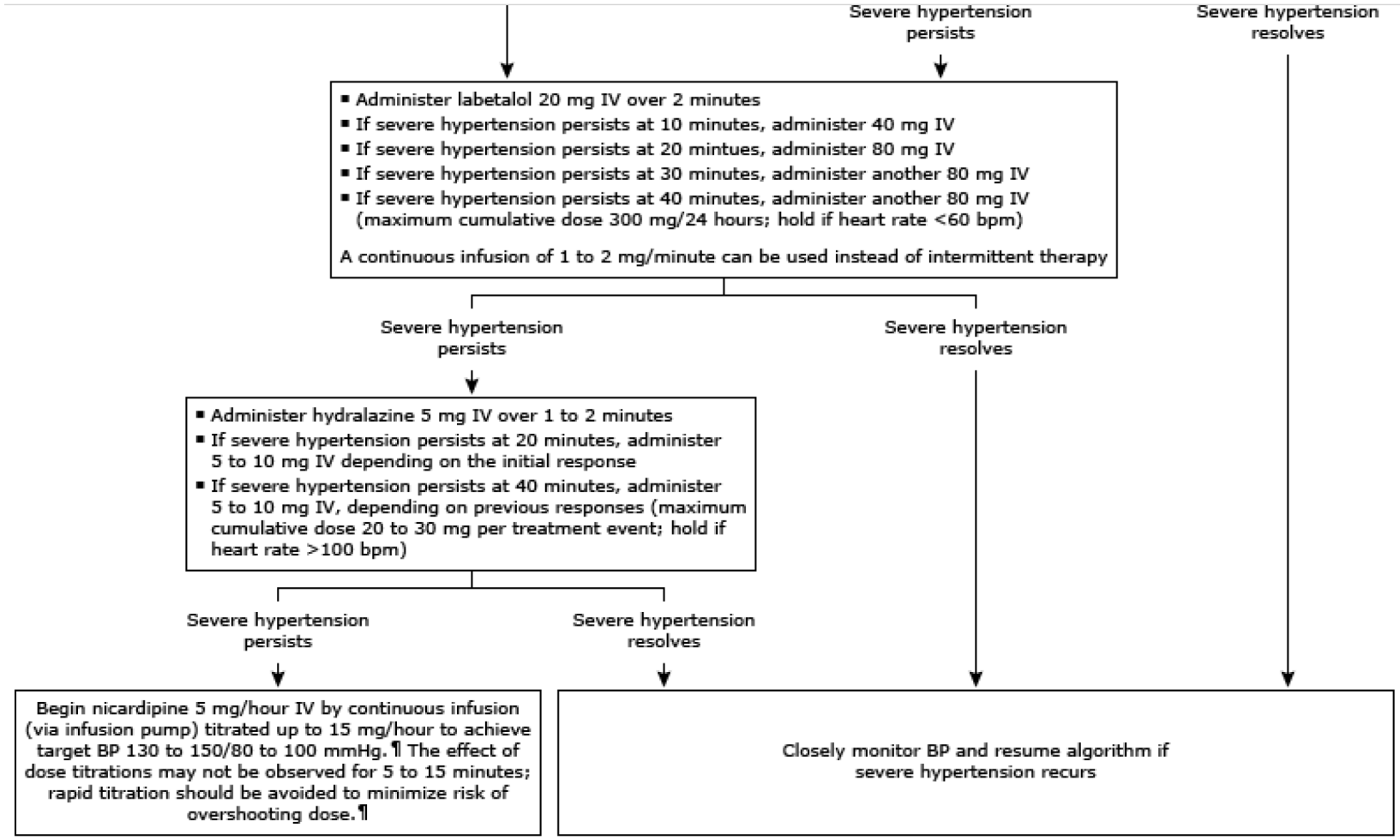

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Target blood pressure

- Once treatment is initiated, we attempt to reduce mean arterial pressure by no more than 25 percent over two hours to achieve target blood pressures of 130 to 150 mmHg systolic and 80 to 100 mmHg diastolic.

- We caution against aggressively lowering blood pressure (eg, <120/80) in such cases as this may reduce uteroplacental perfusion.

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WHEN TO INITIATE ANTIHYPERTENSIVE THERAPY IN PREGNANCY

- Patients with nonsevere hypertension (chronic or pregnancy-related)

Oral antihypertensive treatment

Antihypertensives

- Preferred: labetalol, nifedipine, hydralazine
- Methyldopa – safe but less effective
- Preferred calcium channel blockers
- Preferred beta blockers
- Use of thiazides

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- **Labetalol** (Combined alpha and beta blocker)

  - 100 mg 2 times daily, increase by 100 mg twice daily every 2 to 3 days as needed
  - 200 to 800 mg in 2 divided doses

Can cause bronchoconstriction. Avoid in patients with asthma, chronic obstructive lung disease, heart failure, bradycardia (heart rate <60 beats per minute), or greater than first-degree heart block.

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- **Nifedipine** extended release (ER) (Calcium channel blocker)

- 30 to 60 mg once daily as an extended release tablet, increase at 7 to 14 day intervals
- 30 to 90 mg once daily

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- **Methyldopa** (Centrally acting alpha agonist)

  - 250 mg 2 to 3 times daily, increase every 2 days as needed
  - 250 to 1000 mg in 2 to 3 divided doses

Sedation is a common side effect.

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- **Hydralazine** (Peripheral vasodilator)

  - Begin with 10 mg 4 times per day, increase by 10 to 25 mg/dose every 2 to 5 days
  - 50 to 100 mg in 2 to 4 divided doses 200 mg

Due to reflex tachycardia, monotherapy with oral hydralazine is not recommended; hydralazine may be combined with methyldopa or labetalol if needed as add-on therapy

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Antihypertensives

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DRUGS TO AVOID IN PREGNANCY

- Selected beta blockers: Atenolol and propranolol
- ACE inhibitors, ARBs, direct renin inhibitors
- Mineralocorticoid receptor antagonists
- Nitroprusside

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Common Oral Antihypertensive Agents in Pregnancy

Drug	Dosage	Comments
Labetalol	200-2400 mg/d orally in 2 to 3 divided doses. Commonly initiated at 100-200 mg twice daily.	Potential bronchoconstrictive effects. Avoid in women with asthma, preexisting myocardial disease, decompensated cardiac function, and heart block and bradycardia.
Nifedipine	30-120 mg/d orally of an extended-release preparation. Commonly initiated at 30-60 mg once daily (extended release).	Do not use sublingual form. Immediate-release formulation should generally be reserved for control of severe, acutely elevated blood pressures in hospitalized patients. Should be avoided in tachycardia.
Methyldopa	500-3000 mg/d orally in 2 to 4 divided doses. Commonly initiated at 250 mg 2 or 3 times daily.	Safety data up to 7 y of age in offspring. May not be as effective as other medications, especially in control of severe hypertension. Use limited by side effect profile (sedation, depression, dizziness).
Hydrochlorothiazide	12.5-50 mg daily	Second- or third-line agent.

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Maternal Complications

- Acute kidney injury, progression of CKD
- HELLP syndrome
- Eclampsia, stroke, DIC

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Fetal Complications

- Intrauterine growth restriction
- Prematurity (iatrogenic or spontaneous)
- Stillbirth, neonatal death

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Prevention – Aspirin & Calcium

- Low-dose aspirin is the only routinely recommended intervention that has been demonstrated to reduce the risk of preeclampsia and its sequelae when taken from 12 weeks of gestation in pregnant people at moderate and greater risk .

- Calcium supplementation in populations with low dietary calcium

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Timing of Delivery

- ≥37 weeks: delivery recommended
- Severe features: consider delivery ≥34 weeks or earlier if unstable
- Corticosteroids for fetal lung maturity if preterm

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Postpartum Management

- Monitor BP and renal function
- Adjust antihypertensives for lactation safety
- Counsel regarding long-term cardiovascular and renal risk

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Monitoring after discharge

- Blood pressure should be followed closely after discharge since blood pressure peaks three to six days postpartum when most patients are at home.
- Patients should be advised to seek medical attention if they develop severe headaches or if blood pressure increases to severe levels.
- Another approach is to ensure measurement at least once during postpartum days 3 to 5.

Monitoring after discharge

- An additional concern in patients discharged on antihypertensive drugs is that they may develop hypotension as their blood pressure returns to the normal baseline level.

- If prepregnancy blood pressure was normal and the patient is normotensive on medication, it is reasonable to stop the antihypertensive drug after approximately three weeks .

Long-Term Maternal Risks

- Increased lifetime risk of chronic hypertension
- Higher risk of CKD and ESKD
- Elevated long-term cardiovascular risk

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Long-Term Offspring Risks

- Higher risk of metabolic syndrome
- Increased risk of hypertension in adulthood
- Low birth weight linked to future renal risk

Guideline Summary

- AHA/ACC 2025: treat ≥160/110, consider ≥140/90 with comorbidities
- ACOG: delivery ≥37 weeks in gestational HTN/PE without severe features
- KDIGO: emphasize renal risk and long-term follow-up

AHA/ACC 2025; ACOG; KDIGO

Conclusion

- PIH is a leading cause of maternal and fetal morbidity
- Early recognition and management essential
- Long-term renal and cardiovascular risks warrant follow-up

References

- AHA/ACC 2025 Guideline
- UpToDate: Hypertensive Disorders in Pregnancy (2024)
- ACOG, KDIGO, ISSHP Guidelines