Chronic hypertension(cHTN) in pregnancy

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Topics

- Systemic hypertension, diagnosis and definition
- Definition and staging of cHTN
- Facts related to HTN in pregnancy
- Superimposed preeclampsia
- Treatment(indication and option)
- Postpartom treatment

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CLINICAL PRACTICE GUIDELINE

2017 ACC/AHA/AAPA/ABC/ACPM/AGS/APhA/ASH/ASPC/NMA/PC Guideline for the Prevention, Detection, Evaluation, and Management of High Blood Pressure in Adults: A Report of the American College of Cardiology/American Heart Association Task Force on Clinical Practice Guidelines

Table 6. Categories of BP in Adults* (Table view)

BP Category	SBP		DBP
Normal	<120 mm Hg	and	<80 mm Hg
Elevated	120–129 mm Hg	and	<80 mm Hg
Hypertension			
Stage 1	130–139 mm Hg	or	80–89 mm Hg
Stage 2	≥140 mm Hg	or	≥90 mm Hg

Technical considerations:

4.2. Out-of-Office and Self-Monitoring of BP

Recommendation for Out-of-Office and Self-Monitoring of BP

COR	LOE	Recommendation
I	A^{SR}	1. Out-of-office BP measurements are recommended to confirm the diagnosis of hypertension (Table 11) and for titration of BP-lowering medication, in conjunction with telehealth counseling or clinical interventions.[S4.2-1–S4.2-4]

Table 9. Selection Criteria for BP Cuff Size for Measurement of BP in Adults (Table view)

Arm Circumference	Usual Cuff Size
22–26 cm	Small adult
27–34 cm	Adult
35–44 cm	Large adult
45–52 cm	Adult thigh

Table 11. Corresponding Values of SBP/DBP for Clinic, HBPM, Daytime, Nighttime, and 24-Hour ABPM Measurements (Table view)

Clinic	HBPM	Daytime ABPM	Nighttime ABPM	24-Hour ABPM
120/80	120/80	120/80	100/65	115/75
130/80	130/80	130/80	110/65	125/75
140/90	135/85	135/85	120/70	130/80
160/100	145/90	145/90	140/85	145/90

ABPM indicates ambulatory blood pressure monitoring; BP, blood pressure; DBP, diastolic blood pressure; HBPM, home blood pressure monitoring; and SBP, systolic blood pressure.

with office measurements. Typically, a clinic BP of 140/90 mm Hg corresponds to home BP values of 135/85 mm Hg and to ABPM values defined as a daytime SBP/DBP of 135/85 mm Hg, a nighttime SBP/DBP of 120/70 mm Hg, and a 24-hour SBP/DBP of 130/80 mm Hg.[S4.3-

Definition and staging of chronic hypertension during pregnancy

Disorder	Definition
Hypertension in pregnancy	Systolic blood pressure ≥140 mm Hg or diastolic BP ≥90 mm Hg, or both, measured on two occasions at least 4 hours apart
Severe-range hypertension	Systolic blood pressure ≥160 mm Hg or diastolic BP ≥110 mm Hg, or both, measured on two occasions at least 4 hours apart
Chronic hypertension	Hypertension diagnosed or present before pregnancy or before 20 weeks of gestation; or hypertension that is diagnosed for the first time during pregnancy and that does not resolve it the postpartum period
Chronic hypertension with superimposed preeclampsia	Preeclampsia in a woman with a history of hypertension before pregnancy or before 20 weeks of gestation

Baseline evaluation for all type hypertension in Pregnancy

- Serum creatinine, BUN
- K
- CBC(platelet count)
- LFT
- Spot urine protein/creatinine ratio or dipstick test

(Electrocardiogram or echocardiogram as appropriate)

Screening for secondary hypertension

Primary Hypertension

- Gradual increase in BP, with slow rate of rise in BP
- Lifestyle factors that favor higher BP (eg, weight gain, high-sodium diet, decreased physical activity, job change entailing increased travel, excessive consumption of alcohol)
- Family history of hypertension

Secondary Hypertension

- BP lability, episodic pallor, and dizziness (pheochromocytoma)
- Snoring or hypersomnolence (obstructive sleep apnea)
- Muscle cramps or weakness (hypokalemia from primary aldosteronism or secondary aldosteronism due to renovascular disease)
- Weight loss, palpitations, heat intolerance (hyperthyroidism)
- Edema, fatigue, frequent urination (kidney disease or failure)
- History of coarctation repair (residual hypertension associated with coarctation)
- Central obesity, facial rounding, easy bruisability (Cushing syndrome)
- Medication or substance use (eg, alcohol, NSAIDS, cocaine, amphetamines)
- Absence of family history of hypertension

Staging of HTN during pregnancy:

- Mild HTN: 140-149/90-99
- Moderate HTN: 150-159/100-109
- Severe HTN: ≥160/110

Chronic HTN prevalence and complications

- Lesser prevalent form of hypertension during pregnancy(0.5-35%),
- (most prevalent is gestational HTN)
- Increased risk of HTN,CVD and stroke at long term
- 10 % have proteinuria at baseline during pregnancy

Maternal	Fetal and Neonatal
• Death	• Stillbirth or perinatal death
• Stroke	• Growth restriction
• Pulmonary edema	• Preterm birth
• Renal insufficiency and failure	• Congenital anomalies (eg, heart defects, hypospadias, esophageal atresia)
• Myocardial infarction	
• Preeclampsia	
• Placental abruption	
• Cesarean delivery	
• Postpartum hemorrhage	
• Gestational diabetes	

Decision for treatment of mild-moderate hypertension:

A 2014 Cochrane systematic review of 49 trials (4,723 women) concluded that treatment of mild-to-moderate hypertension reduced the risk of developing severe hypertension but had no effect on the incidence of preeclampsia, preterm birth, fetal death, fetal growth restriction, or any other measured outcome

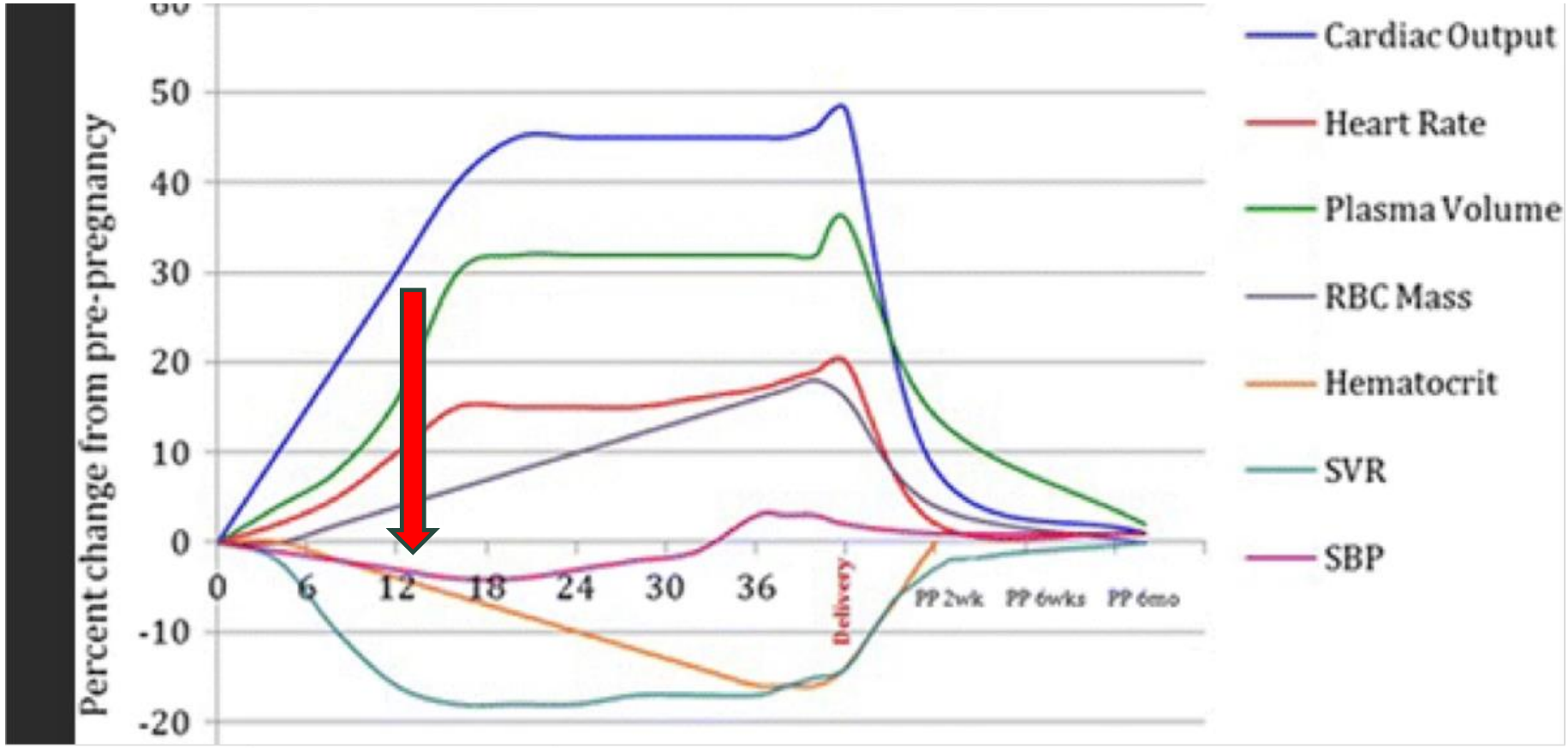
hypertension during pregnancy is worthwhile. The 2015 CHIPS trial, an international randomized controlled trial comparing less tight control (ie, target diastolic blood pressure below 100 mm Hg) to tight control (ie, target diastolic blood pressure below

(48). Tight control of hypertension conferred no benefit to the fetus and had only marginal effects for the woman, namely reduced frequency of progression to severe hypertension. A large multicenter, randomized

Treatment cut off at chronic hypertension during pregnancy

	ACOG/Texas heart institute 2019	ESC 2018	UPTODATE 2021
General population	≥160/105	≥150/95	≥150/95-99
symptoms (headache, chest discomfort, visual disturbense), younger woman with normal baseline or sign of end organ damage (renal impairment)	≥140/90	≥140/90	≥140/90

Physiologic hemodynamic changes during pregnancy



Continuing or discontinuing therapy at non-severe HTN????

- There are minimal data (controversy) to guide regarding continuing or discontinuing therapy (at BP≤ 160 mm Hg/ 110 mm Hg)
- Physiologic decrease of BP around10% at 7 weeks(even more at midpregnancy) with marked decrease in diastolic BP(more than 20 mmhg)
- requiring close monitoring , appropriate surveillance to ensure the patient does not develop blood pressures that do require treatment
- Selecting appropriate drugs

Common oral antihypertensive agents in Pregnancy

Drug	Dosage	Comments
Labetalol	200–2,400 mg/d orally in two to three 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	500–3,000 mg/d orally in two to four divided doses. Commonly initiated at 250 mg twice or three times daily	Safety data up to 7 years 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).

Contraindicated drugs:

- Hydrochlorothiazide may be used as third line.
- ACEI(captopril, enalapril , lisinopril), ARB(losartan, valsartan, telmisartan, candesartan), MRAs(spironolactone, eplerenon) are contraindicated during pregnancy.(during breastfeeding , ACEI may be used cautiously?)
- Atenolol must be avoided
- Propranolol, metoral and labetalol are preferred in breastfeeding women.
- Methyldopa should be avoided at postpartum (depression probability)

Target of therapy(ACOG):

- SBP >120-160 mmhg
- DBP >80-110 mmhg

- Prevention from over treatment(risk of placental hypo-perfusion)

Target blood pressure?

Recommended by	Target
ACOG	120-160/80-110 mmhg
UPTODATE	120-150/80-100 mmhg

Additional treatment

- +Low dose ASA (100-150mg) at moderate or high risk of preeclampsia from weeks 12 up to 36-37(ESC)

Treatment of severe hypertension (≥160/110)

- Confirming persistent severe HTN (15 minutes or more), antihypertensive agents should be administered within 30–60 minutes
- Hospitalization is recommended(ESC)
- Monitoring of viable foetuses
- Diastolic BP < 80 mm Hg may cause fetal heart rate abnormalities (uteroplacental hypoperfusion).
- epidural anesthesia decrease BP about15%,

Treatment of severe hypertension …

- IV Nitro-glycerine at pulmonary edema

Severe hypertension treatment(≥160/110)

Drug	Dosage	Comments	Onset of Action
Labetalol	10–20 mg IV, then 20–80 mg every 10–30 minutes to a maximum cumulative dosage of 300 mg; or constant infusion 1–2 mg/min IV	Tachycardia is less common and fewer adverse effects than other agents. Avoid in women with asthma, preexisting myocardial disease, decompensated cardiac function, and heart block and bradycardia.	1–2 minutes
Hydralazine	5 mg IV or IM, then 5–10 mg IV every 20–40 minutes to a maximum cumulative dosage of 20 mg; or constant infusion of 0.5–10 mg/hr	Higher or frequent dosage associated with maternal hypotension, headaches, and abnormal fetal heart rate tracings; may be more common than other agents.	10–20 minutes
Nifedipine (immediate release)	10–20 mg orally, repeat in 20 minutes if needed; then 10–20 mg every 2–6 hours; maximum daily dose is 180 mg	May observe reflex tachycardia and headaches.	5–10 minutes

Abbreviations: IM, intramuscularly; IV, intravenously.

Superimposed preeclampsia:

- 20-25% develop superimposed preeclampsia
- Sudden increase in BP
- Proteinuria after 20 weeks
- Evidence of end organ damage(pulmonary edema, increased Cr,LFT,platelet, or RUQ pain)
- Uterine Doppler velocimetry could predict!!

Postpartum period;

- After an initial decline immediately after delivery, blood pressure tends to rise.

(A rapid decrease in BP postpartum indicate substantial blood loss)

- Severe hypertension or superimposed preeclampsia also may develop for the first time in the postpartum period;

Take home message

- Home blood pressure and ABPM is helpful at suspicious white coat hypertension
- therapy is recommended for persistent chronic hypertension whe(ACOG recommendation ≥160/105 mmhg or ESC/UPTODATE 150/95 mmhgn)
- labetalol or nifedipine are reasonable options and are recommended above all other antihypertensive drugs(and methyldopa as alternative)
- Screening for superimposed preeclampsia at sudden increased BP, or symptoms of preeclampsia

- Target BP (ACOG recommendation 120-160/80-105 mmhg or ESC/UPTODATE 120-150/80-95 mmhgn)