

Hypertension in Pregnancy:
Breaking down the new ACOG
guidelines

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Disclosures

- None

Goals

- Describe the classification system and the diagnostic criteria of hypertensive disorders of pregnancy
- Define the indications for pharmacologic treatment of hypertension in pregnancy and the drugs of choice
- Outline the recommendations for delivery in women with various forms of hypertension in pregnancy

Classification of Hypertensive Disorders of Pregnancy

1. Preeclampsia–eclampsia
2. Chronic hypertension (of any cause)
3. Chronic hypertension with superimposed preeclampsia
4. Gestational hypertension

Case

- 26 y/o G1P0 at 36 weeks presents with new onset headache, blurry vision and BP 142/98.
 - OE: well appearing, size=dates, 3+ patellar reflexes, RNST.
 - Labs: TP/Cr ratio=0.2, cr= 0.8, plt= 180,000, AST/ALT= 22/24, uric acid= 7.2
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- What is the most likely dx:
 1. Mild preeclampsia
 2. Severe preeclampsia
 3. Gestational HTN
 4. Chronic HTN

TABLE E-1. Diagnostic Criteria for Preeclampsia

Blood pressure	<ul style="list-style-type: none"> Greater than or equal to 140 mm Hg systolic or greater than or equal to 90 mm Hg diastolic on two occasions at least 4 hours apart after 20 weeks of gestation in a woman with a previously normal blood pressure Greater than or equal to 160 mm Hg systolic or greater than or equal to 110 mm Hg diastolic, hypertension can be confirmed within a short interval (minutes) to facilitate timely antihypertensive therapy
and	
Proteinuria	<ul style="list-style-type: none"> Greater than or equal to 300 mg per 24-hour urine collection (or this amount extrapolated from a timed collection) or Protein/creatinine ratio greater than or equal to 0.3* Dipstick reading of 1+ (used only if other quantitative methods not available)
Or in the absence of proteinuria, new-onset hypertension with the new onset of any of the following:	
Thrombocytopenia	<ul style="list-style-type: none"> Platelet count less than 100,000/microliter
Renal insufficiency	<ul style="list-style-type: none"> Serum creatinine concentrations greater than 1.1 mg/dL or a doubling of the serum creatinine concentration in the absence of other renal disease
Impaired liver function	<ul style="list-style-type: none"> Elevated blood concentrations of liver transaminases to twice normal concentration
Pulmonary edema	
Cerebral or visual symptoms	

*Each measured as mg/dL.

T or F

- A woman at 35 weeks with persistent BP ~150/100 and 6 gm of protein in the urine has severe preeclampsia and should be delivered?

• F

Findings no longer part of the diagnostic criteria for severe preeclampsia

- Massive proteinuria (≥ 5 g): minimal relationship between quantity of urinary protein and pregnancy outcome
- Fetal growth restriction: managed similarly in pregnant women with and without preeclampsia

Eclampsia

- New-onset grand mal seizures in a woman with preeclampsia
- Can occur before, during, or after labor.
 - Antepartum: 38-55%
 - Intrapartum: 13-36%
 - PP:
 - ≤ 48 hours: 5-39%
 - >48 hours: 5-17%

Sibai Obstet Gynecol. 2005;105(2):402
Tuffnell BJOG. 2005;112(7):875

Chronic Hypertension

- Elevated BP (≥140/90 mm Hg) that predates conception or detected <20 wks
- Present in up to 5% of pregnant women
- Superimposed preeclampsia develops in 13– 40% of women with CHTN

Chronic Hypertension with Superimposed Preeclampsia

- DX is more likely in the following scenarios:
 1. CHTN w/new onset proteinuria >20 wks
 2. CHTN w/ baseline proteinuria w/sudden ↑ of HTN, or escalating dose of antihypertensive esp when previously well controlled
 3. Sudden lab abnl (↑ LFTs or plts <100,000)
 4. RUQ pain +/- or severe headaches
 5. Pulmonary edema
 6. Renal insufficiency (Cr: doubling or ↑ ≥1.1 mg/dL)
 7. Sudden, substantial, and sustained ↑ in protein excretion

Chronic Hypertension with Superimposed Preeclampsia

- Management is guided by the subcategory (analogous to “preeclampsia with severe features” and “preeclampsia without severe features”)

Gestational Hypertension

- New-onset HTN ($\geq 140/90$ mm Hg) >20 wks, often near term, w/o proteinuria
- Mild HTN: favorable outcome expected
- Severe HTN: outcomes similar to women with severe preeclampsia

Prevention of Preeclampsia

Case

- 32 y/o G2P0101 at 12 weeks with nl BP but h/o induced delivery at 33 wks from severe preeclampsia. The best option to minimize her risk of recurrent preeclampsia is?
1. Yoga
 2. Vitamin E
 3. Bed rest
 4. Low dose aspirin
 5. Fish oil

Prevention of Preeclampsia

- TASK FORCE RECOMMENDATION
- **For women w/ a h/o early-onset preeclampsia and preterm delivery <34 0/7 wks or preeclampsia in >1 prior pregnancy, daily low-dose (60–80 mg) aspirin beginning in the late first trimester is suggested**
- Quality of evidence: Moderate
- Strength of recommendation: Qualified

Low dose aspirin (LDA)

- 17% (CI 11-23%) reduction in the risk of preeclampsia (NNT= 72)
- High risk- 25%↓in the risk of preeclampsia (95% CI 34% to 15% reduction) (NNT= 19)
- Moderate-low risk: 14% reduction in the risk of preeclampsia (95% CI 21% to 5% reduction) (NNT= 119)

Duley. The Cochrane Library 2010, Issue 10

Management

Mild gestational hypertension (GHTN) or preeclampsia without severe features (P-sf)

- Mild gestational hypertension: progression to severe GHTN or preeclampsia often develops within 1–3 weeks
- P-sf: progression to severe preeclampsia could happen within days

Case

- 28 y/o G1 at 35 wks w/ GHTN and persistent BP of 150s/90-100. No sx's. EFW= 25%ile. AFV=nl, NST=R. ACOG recommends:
 1. Do not give antihypertensive medication
 2. Start labetalol
 3. Start methyldopa
 4. Place on strict bed rest
 5. Umbilical artery Doppler

Antihypertensive Therapy

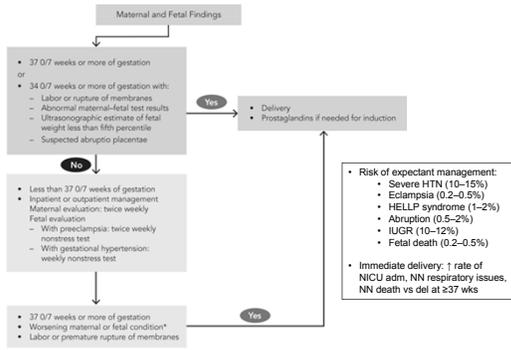
- TASK FORCE RECOMMENDATION
- **For mild GHTN or preeclampsia with a persistent BP <160 mm Hg systolic or 110 mm Hg diastolic, it is suggested that antihypertensive medications not be administered**
- Quality of evidence: Moderate
- Strength of recommendation: Qualified

T or F

- Same pt develops P-sf at 36w 2d. ACOG recommends delivery at this time

• **F**

Management of mild gestational hypertension or preeclampsia without severe features



Bed Rest

- TASK FORCE RECOMMENDATION
- **For women with GHTN or P-sf, it is suggested that strict bed rest not be prescribed***

*There may be situations in which different levels of rest, either at home or in the hospital, may be indicated for individual women. The previous recommendations do not cover advice regarding overall physical activity and manual or office work.

- Quality of evidence: Low
- Strength of recommendation: Qualified

T or F

- Your pt w/ P-sf comes in for del at 37 wks. She denies H/A or visual disturbance. ACOG recommends against magnesium sulfate for seizure prophylaxis

• T

Magnesium Sulfate Prophylaxis

- TASK FORCE RECOMMENDATION
- **For women with preeclampsia with BP <160/110 mm Hg and no maternal symptoms, it is suggested that magnesium sulfate not be administered universally for the prevention of eclampsia**

- Quality of evidence: Low
- Strength of recommendation: Qualified

Severe Preeclampsia

Antihypertensive Drugs to Treat Severe HTN in Pregnancy

Antihypertensive Drugs to Treat Severe HTN in Pregnancy

- TASK FORCE RECOMMENDATION
- **For women with preeclampsia with severe HTN (sustained BP \geq 160/110 mm Hg), the use of antihypertensive therapy is recommended.**
- Quality of evidence: Moderate
- Strength of recommendation: Strong

Case

- You are inducing a term nullip w/ severe preeclampsia and SBP persistently >160 mmHg. ACOG recommends which of the following?
- IV enalaprilat
- IV hydralazine
- IV labetalol
- PO nifedipine
- IV nitroglycerine

Order Set for Severe Intrapartum or Postpartum Hypertension Initial First-Line Management With Labetalol

1. BP is $\geq 160/110$ mm Hg.
2. **Labetalol (20 mg IV over 2 minutes).**
3. Repeat BP in 10 minutes.
4. If BP still \uparrow , **labetalol (40 mg IV over 2 minutes).**
5. Repeat BP in 10 minutes.
6. If BP still \uparrow , **labetalol (80 mg IV over 2 minutes).**
7. Repeat BP in 10 minutes.
8. If BP still \uparrow , **hydralazine (10 mg IV over 2 minutes)**
9. Repeat BP in 20 minutes.
10. If either BP threshold is still exceeded, obtain emergency consultation from MFM, internal medicine, anesthesia, or critical care specialists.
11. Once BP improved, repeat BP q 10 min x 1 hr, then q 15 min x 1 hr, then q 30 min x 1 hr, and then q hr x 4 hrs

ACOG Committee Opinion. #514. 12/11

Order Set for Severe Intrapartum or Postpartum Hypertension Initial First-Line Management With Hydralazine

1. BP is $\geq 160/110$ mm Hg.
2. **Hydralazine (5 mg or 10 mg IV over 2 minutes).**
3. Repeat BP in 20 minutes.
4. If BP still \uparrow , **hydralazine (10 mg IV over 2 minutes).**
5. Repeat BP in 20 minutes.
6. If BP still \uparrow , **labetalol (20 mg IV over 2 minutes).**
7. Repeat BP in 10 minutes.
8. If BP still \uparrow , **labetalol (40 mg IV over 2 minutes)** and obtain emergency consultation from maternal-fetal medicine, internal medicine, anesthesia, or critical care specialists.
9. Once BP improved, repeat BP q 10 min x 1 hr, then q 15 min x 1 hr, then q 30 min x 1 hr, and then q hr x 4 hrs

ACOG Committee Opinion. #514. 12/11

• TASK FORCE RECOMMENDATIONS

• Corticosteroids should be given if the fetus is viable and at ≤ 33 6/7 weeks, **but delivery not be delayed** after initial maternal stabilization regardless of gestational age for women with severe preeclampsia complicated by any of the following:

- uncontrollable severe HTN
- eclampsia
- pulmonary edema
- abruptio placentae
- disseminated intravascular coagulation
- evidence of nonreassuring fetal status
- intrapartum fetal demise

• Quality of evidence: Moderate
• Strength of recommendation: Strong

• TASK FORCE RECOMMENDATIONS

• corticosteroids should be administered and **delivery deferred for 48 hrs** if maternal/fetal conditions remain stable for women with severe preeclampsia and a viable fetus at ≤ 33 6/7 weeks with any of the following:

- PPROM or PTL
- HELLP or partial HELLP syndrome
- IUGR (<5th percentile)
- severe oligohydramnios
- reversed end-diastolic umbilical artery flow
- new-onset renal dysfunction or increasing renal dysfunction

• Quality of evidence: Moderate
• Strength of recommendation: Qualified

Route of Delivery in Preeclampsia

• Vaginal delivery can often be accomplished, but this is less likely with \downarrow gestational age.

• Rate of CD based on gestational age

- < 28 wks: 93–97%
- 28–32 wks: 53–65%
- 32–34 wks: 31–38%

Eclampsia

- New-onset grand mal seizures in pt w/ preecl
- Preceded by a wide range of S+Sx: severe to minimal or absent HTN, massive to no proteinuria, and prominent to no edema
- Clinical Sxs potentially helpful in predicting impending eclampsia:
 - persistent occipital or frontal headaches
 - blurred vision or photophobia
 - epigastric or RUQ pain or both
 - altered mental status

TASK FORCE RECOMMENDATIONS

- **For eclampsia, magnesium sulfate is recommended**
- **For severe preeclampsia, intrapartum–postpartum magnesium sulfate to prevent eclampsia is recommended**
 - Quality of evidence: High
 - Strength of recommendation: Strong
- **For women with preeclampsia undergoing cesarean delivery, continue intraoperative magnesium sulfate to prevent eclampsia.**
 - Quality of evidence: Moderate
 - Strength of recommendation: Strong

HELLP Syndrome

HELLP Syndrome

- Microangiopathic hemolytic anemia (haptoglobin \leq 25 mg/dL or LDH $>$ 600 IU/L)
- Platelet count \leq 100,000
- Serum AST \geq 70 IU/L

- Inc= 0.1-0.8% (10-20% w/ severe preecl)
- Usually betw 28-36 wks
- 70% antepartum (80% $<$ 37 wks and 15% $<$ 27 wks) and 30% PP (~20% had preecl before del)

HELLP Syndrome

- TASK FORCE RECOMMENDATIONS

- **For women with HELLP syndrome from the gestational age of fetal viability to 33 6/7 wks, it is suggested that delivery be delayed for 24–48 hours if maternal and fetal condition remain stable to complete a course of corticosteroids for fetal benefit**

- Quality of evidence: Low
- Strength of recommendation: Qualified

HELLP Syndrome

- Prompt delivery is indicated if:
 - \geq 34 wks or earlier if there is:
 - disseminated intravascular coagulation
 - liver infarction or hemorrhage
 - renal failure
 - pulmonary edema
 - suspected abruptio placentae
 - nonreassuring fetal status

Postpartum Hypertension and Preeclampsia

Case

- Pt calls 6 d after uneventful term CD. She c/o new onset H/A. SBP in triage is persistently in the 150s. Preecl labs= nl. The best course of action is:
1. Rx w/ antihypertensive and d/c home
 2. Admit, start MgSO₄, Rx HTN, stop Ibuprofen
 3. Admit, observe and stop Ibuprofen
 4. D/C from triage w/ f/u in 1 wk

Postpartum Hypertension and Preeclampsia

- Preeclampsia/eclampsia can develop up to 4 weeks postpartum (~5% of all preecl cases).
- In women with preeclampsia or superimposed preeclampsia, BP usually ↓ within 48 hrs after delivery, but BP↑ again 3–6 days postpartum
- Most women who presented with eclampsia in the postpartum period had Sxs for hours and days before presentation

Postpartum Hypertension and Preeclampsia

- TASK FORCE RECOMMENDATIONS
- **For women w/ HTN, BP monitoring in the hospital or home for at least 72 hrs postpartum and again 7–10 days after delivery or earlier in women with symptoms is suggested.**
- Quality of evidence: Moderate
- Strength of recommendation: Qualified

Postpartum Hypertension and Preeclampsia

- TASK FORCE RECOMMENDATIONS
- **All post partum women should receive discharge counseling about the S+Sxs of preeclampsia and should report such events promptly.**
- Quality of evidence: Low
- Strength of recommendation: Qualified

Postpartum Hypertension and Preeclampsia

- TASK FORCE RECOMMENDATIONS
- **Postpartum women with new-onset HTN w/ headache or blurred vision or preeclampsia with severe HTN, should receive magnesium sulfate.**
- Quality of evidence: Low
- Strength of recommendation: Qualified

Postpartum Hypertension and Preeclampsia

- TASK FORCE RECOMMENDATIONS
- **For women w/ persistent postpartum BP of $\geq 150/100$ mm Hg, on at least 2 occasions at least 4–6 hrs apart, antihypertensive therapy is suggested. Persistent BP of $\geq 160/100$ mm Hg should be treated within 1 hour.**
- Quality of evidence: Low
- Strength of recommendation: Qualified

Postpartum Hypertension and Preeclampsia

- Non-steroidal anti-inflammatory agents should be replaced by other analgesics in women with hypertension that persists for more than 1 day postpartum.

Chronic Hypertension in Pregnancy and Superimposed Preeclampsia

Case

- 36 y/o obese G2P1 w/ h/o CHTN presents at 8 wks on labetalol 100 mg bid. BP= 142/92. Preecl labs= nl. No end-organ injury. Best recommendation is:

1. Lose weight during pregnancy
2. Stop exercise
3. Stop labetalol
4. Continue labetalol
5. Switch to methyldopa

- TASK FORCE RECOMMENDATION

- **If BP <160/105 mm Hg and no evidence of end-organ damage, then do not treat.**

- Quality of evidence: Low
- Strength of recommendation: Qualified

- For women w/ CHTN, discontinuing medications during the first trimester and restarting them if BP approaches the severe range is reasonable practice.

- TASK FORCE RECOMMENDATION

- **For persistent CHTN of \geq 160/105 mm Hg, antihypertensive therapy is recommended.**

- Quality of evidence: Moderate
- Strength of recommendation: Strong

- **BP levels be maintained between 120/80 and 160/105 mm Hg**

- Quality of evidence: Low
- Strength of recommendation: Qualified

Common Oral Antihypertensive Agents in Pregnancy

Drug	Dose	Comments
Labetalol	200–2,400 mg/d orally in 2-3 divided doses	-Well tolerated -Potential bronchoconstrictive effects -Avoid in patients with asthma and CHF
Nifedipine	30–120 mg/d orally of a slow-release preparation	Do not use sublingual form
Methyldopa	0.5–3 g/d orally in 2-3 divided doses	-Childhood safety data up to 7 years of age -May not be as effective in control of severe hypertension
Thiazide diuretics	Depends on agent	Second-line agent
Angiotensin-converting enzyme inhibitors/angiotensin receptor blockers		Associated with fetal anomalies Contraindicated in pregnancy and preconception period

CHTN: timing of delivery

- TASK FORCE RECOMMENDATION
- **For women with chronic hypertension and no additional maternal or fetal complications, delivery before 38 0/7 weeks of gestation is not recommended.**
- Quality of evidence: Moderate
- Strength of recommendation: Strong

CHTN in the Postpartum Period

- BP often ↑er PP vs AP, esp 1st 2 wks
 - Need for meds is common
- Maintain BP <150/100
- Avoid NSAIDs PP if hypertensive

Summary

- Preecl= new onset BP $\geq 140/90$ w/ proteinuria
 - May dx w/o proteinuria (plt $< 100k$, LFT \uparrow , cr ≥ 1.2 , pulm edema, CNS disturbance)
- Preecl: prev= ~4%; severe ~1/3 of cases
 - ~10% < 34 wks and ~5% occur PP
- Protein $\geq 5gm$ + IUGR- no longer criteria for severe
- LDA $> 1st\Delta$ if h/o severe early preecl or rec preecl

Summary

- New onset HTN, RX $\geq 160/110$ mmHg
- CHTN, RX $\geq 160/105$ mmHg
- PP HTN, RX $\geq 150/100$ (w/in 1 hr if $\geq 160/100$)
 - Labetalol, hydralazine and nifedipine= 1st line urgent
 - Labetalol, nifedipine and methyldopa= 1st line PO

Summary

- Delivery
 - Mild GHTN/P-sf: ≥ 37 wks
 - Severe preecl: ≥ 34 wks; exp mngmnt only if stable
 - HELLP: ≥ 34 wks, < 34 wks after steroids if stable
 - CHTN (stable): ≥ 38 wks
- MgSO4 only for severe dz
- Severe preecl \neq CD
- PP preecl ~5%
- Avoid NSAIDs if hypertensive

Thank You
Questions?
