

# Postpartum Hypertension Management

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Oregon Perinatal Collaborative



# Disclosures

# Objectives



Establish the importance of postpartum hypertension management



Query the goals of postpartum hypertension management



Review pragmatic ways to manage blood pressure postpartum


# What is Postpartum Hypertension?

- Hypertensive disease of pregnancy (HDP): gestational hypertension and preeclampsia
- Chronic hypertension



# Definitions

- Preeclampsia:
  - SBP  $\geq$  140 mmHg or DBP  $\geq$  90 mmHg and
  - Proteinuria
    - Or, in absence of proteinuria:
      - Platelets  $<100 \times 10^9/L$
      - Renal insufficiency: Creatinine  $>1.1$  mg/dL or doubled
      - Impaired liver function: Transaminases twice normal
      - Pulmonary edema
      - New onset headache or visual symptoms
    - Severe hypertension: SBP  $\geq$  160 mmHg or DBP  $\geq$  110 mmHg
- Gestational Hypertension: elevated blood pressure alone



Why does it matter?

- **Common**
  - Hypertensive disorders of pregnancy (HDP) complicate 5-10% of pregnancies
- **Harmful**
  - Leads to severe maternal morbidity
- **Equity issue**
  - Increased risk in Black pregnant people

# What is Hypertension?

<b>BLOOD PRESSURE CATEGORY</b>	<b>SYSTOLIC mm Hg (upper number)</b>	<b>and/or</b>	<b>DIASTOLIC mm Hg (lower number)</b>
<b>NORMAL</b>	LESS THAN 120	and	LESS THAN 80
<b>ELEVATED</b>	120 – 129	and	LESS THAN 80
<b>HIGH BLOOD PRESSURE (HYPERTENSION) STAGE 1</b>	130 – 139	or	80 – 89
<b>HIGH BLOOD PRESSURE (HYPERTENSION) STAGE 2</b>	140 OR HIGHER	or	90 OR HIGHER
<b><u>HYPERTENSIVE CRISIS</u> (consult your doctor immediately)</b>	HIGHER THAN 180	and/or	HIGHER THAN 120



# Treatment for Mild Chronic Hypertension during Pregnancy

Alan T. Tita, M.D., Ph.D., Jeff M. Szychowski, Ph.D., Kim Boggess, M.D., Lorraine Dugoff, M.D., Baha Sibai, M.D., Kirsten Lawrence, M.D., Brenna L. Hughes, M.D., Joseph Bell, M.D., Kjersti Aagaard, M.D., Ph.D., Rodney K. Edwards, M.D., Kelly Gibson, M.D., David M. Haas, M.D., et al., for the Chronic Hypertension and Pregnancy (CHAP) Trial Consortium\*

- 2408 people, 61 centers
- Randomized to  $<140/90$  or  $<160/105$
- Primary composite outcome: preeclampsia with severe features, medically indicated PTB  $<35$  weeks, placental abruption, perinatal death
- 30% vs 37%, aRR 0.82 (95% CI 0.74-0.92)
- No difference in SGA, aRR 1.04 (95% CI 0.82-1.31)
- SMM 2.1 vs 2.8%





Based on these findings, **ACOG recommends utilizing 140/90 as the threshold for initiation or titration of medical therapy for chronic hypertension in pregnancy, rather than the previously recommended threshold of 160/110** **2** . For patients on blood pressure medications at the start of pregnancy, in the absence of mitigating factors or side effects, they can be maintained on their medications, rather than discontinuing them and waiting to initiate treatment for blood pressures in the severe range.

# Postpartum HDP

40% of all pregnancy-related deaths are postpartum

HDP are a leading cause of postpartum readmission

# Inpatient Treatment of Hypertension

- Goals of treatment:
  - Prevent heart failure, MI, renal injury, and stroke
- Persistent severe BP requires treatment within 30-60 minutes
- Timely treatment is less likely postpartum (Deshmukh 2021)
- Semiautonomous algorithms improved treatment within 15 minutes:
  - 36.5% pre-implementation vs 55.6% post-implementation (Martin 2021)



**Table 3. Antihypertensive Agents Used for Urgent Blood Pressure Control in Pregnancy**

Drug	Dose	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 with fewer adverse effects.  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.

# Oral Control Medications

Medication	Initial dose	Maximum dose	Mechanism	Contraindications
Labetalol	200mg every 12 hours	<ul style="list-style-type: none"><li>• 800mg every 8 hours</li><li>• 2400 mg/day</li></ul>	<ul style="list-style-type: none"><li>• Alpha and beta blockade (B1 and B2)</li><li>• Alpha:beta 1:3 with oral</li></ul>	<ul style="list-style-type: none"><li>• Overt cardiac failure</li><li>• Asthma</li><li>• &gt;1st degree heart block</li><li>• Severe bradycardia</li></ul>
Nifedipine XR	30mg daily	<ul style="list-style-type: none"><li>• 120mg daily (often split into two doses)</li></ul>	<ul style="list-style-type: none"><li>• Calcium channel blocker (dihydropyridine subclass)</li></ul>	<ul style="list-style-type: none"><li>• Hypersensitivity</li><li>• ST-elevation MI</li><li>• Severe aortic stenosis</li></ul>

# Furosemide?

RCT of 5 day course of furosemide 20mg PO for HDP (n=384)

Decrease in persistently elevated BP at 7 days (aRR 0.4, 95% CI 0.2-0.8)

Days to resolution of BP elevation shorter in non-severe disease (8.5 vs 10.5 days)

NO difference in the severe group

NO difference in additional anti-hypertensives, readmissions, ED visits, postpartum BPs in severe range (6.8 vs 6.6%)

# Optimizing Postpartum Care

Committee Opinion  | Number 736 | May 2018

Substantial morbidity occurs in the early postpartum period; more than one half of pregnancy-related maternal deaths occur after the birth of the infant [6](#). Blood pressure evaluation is recommended for women with hypertensive disorders of pregnancy no later than 7–10 days postpartum [28](#), and women with severe hypertension should be seen within 72 hours; other experts have recommended follow-up at 3–5 days [29](#). Such assessment is critical given that more than one half of postpartum strokes occur within 10 days of discharge [30](#).





Society for  
Maternal • Fetal  
Medicine  
High-risk pregnancy experts

**SMFM Special Statement**

[smfm.org](https://smfm.org)

# Society for Maternal-Fetal Medicine Special Statement: Quality metric for timely postpartum follow-up after severe hypertension

**Society for Maternal-Fetal Medicine (SMFM); Kelly S. Gibson, MD; C. Andrew Combs, MD, PhD; Samuel Bauer, MD; Rebecca Feldman Hamm, MD; Andrew Healy, MD; Jamie Morgan, MD; Lorraine Toner, MD; Amy Whitsel, MD; Patient Safety and Quality Committee**



# Outpatient Follow up

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- 14% with HDP had BP check within 10 days of delivery (Campbell 2022)

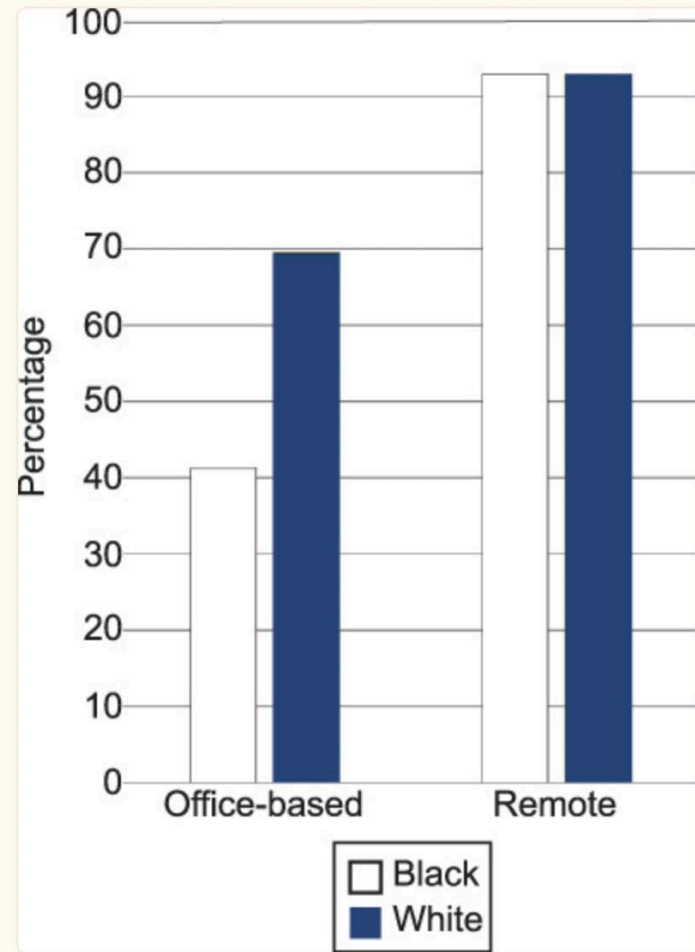
# Telehealth

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			Impact of Telehealth
Hoppe KK, AJOG 2020	Nonrandomized controlled trial	428	<ul style="list-style-type: none"> <li>Fewer HTN readmissions in standard: 0.5 vs 3.7%, aRR 0.12</li> <li>More BP reviews within 10 days of delivery: 94.4 vs 60.3%</li> </ul>
Hauspurg A, Obstet Gynecol 2019	Feasibility	499	<ul style="list-style-type: none"> <li>171 had medication management</li> <li>88% attended 6-week postpartum visit</li> </ul>
Janssen MK, AJOG MFM 2021	Feasibility	199	<ul style="list-style-type: none"> <li>97% submitted at least 1 BP</li> <li>35% had at least one elevated</li> </ul>
Khosla K, AJOG MFM 2022	Retrospective cohort, pre- and post-Telehealth	473 (76.3% non-hispanic Black)	<ul style="list-style-type: none"> <li>PP HTN follow up attendance increased from 48.5 to 76.3% among non-Hispanic Black people (p&lt;0.001) but stayed the same in non-Hispanic white people (73.1 to 76.7%)</li> </ul>
Triebwasser JE, Preg Hypertens 2020	Comparison between RCT and implementation	Implementation n=333 Trial n=103	<ul style="list-style-type: none"> <li>Any BP check 95.5% vs 92.2%; &lt;10 days 84.7% vs 81.6%</li> <li>No differences in BP ascertainment among Black and non-Black people in either group</li> </ul>
Arkerson BJ, Obstet Gynecol 2023	RCT	197	<ul style="list-style-type: none"> <li>Higher ascertainment within 10 days: 91.7 vs 58.4% (p&lt;0.001)</li> <li>No difference in readmission (4.2 vs 5.0%) or initiation of medication (9.4 vs 6.9%)</li> <li>Black patients had lower rates in in-office arm (41.2 vs 69.5%) but no difference in remote management arm (92.9 vs 92.9%)</li> <li>17.9% of Black patients had medication initiation in remote group but only 5.9% in in-office group</li> </ul>





[Fig. 2.](#)

**Blood pressure ascertainment in each arm, stratified by race.**

*Arkerson. Remote Blood Pressure Monitoring Postpartum. Obstet Gynecol 2023.*

# Patient perceptions of Telehealth



## **Pros:**

- Convenience
- Communication with RNs
- Sense of control
- More information

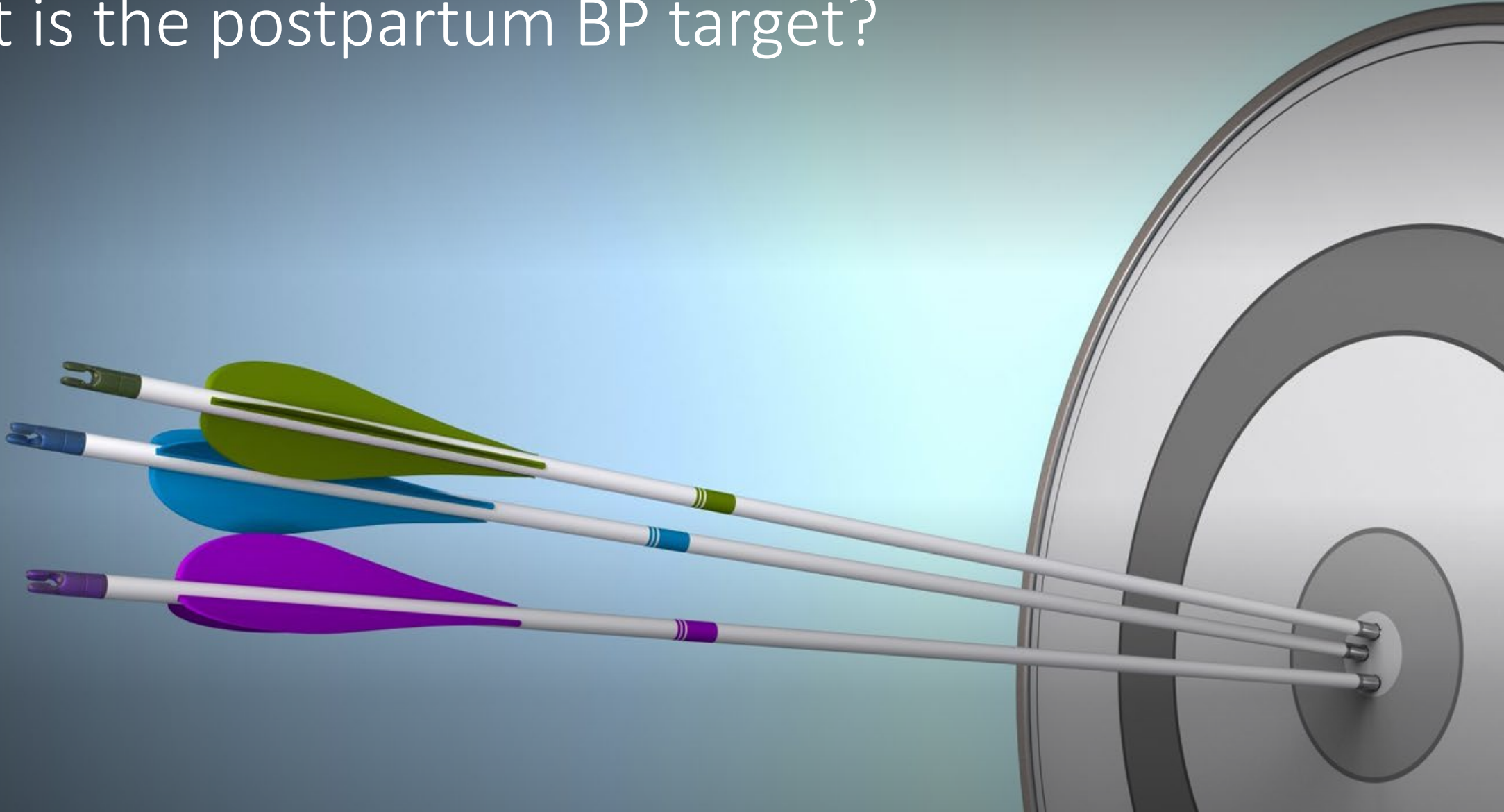


## **Cons:**

- Barriers of BP cuff size
- Wireless connection
- Stress associated with monitoring

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What is the postpartum BP target?

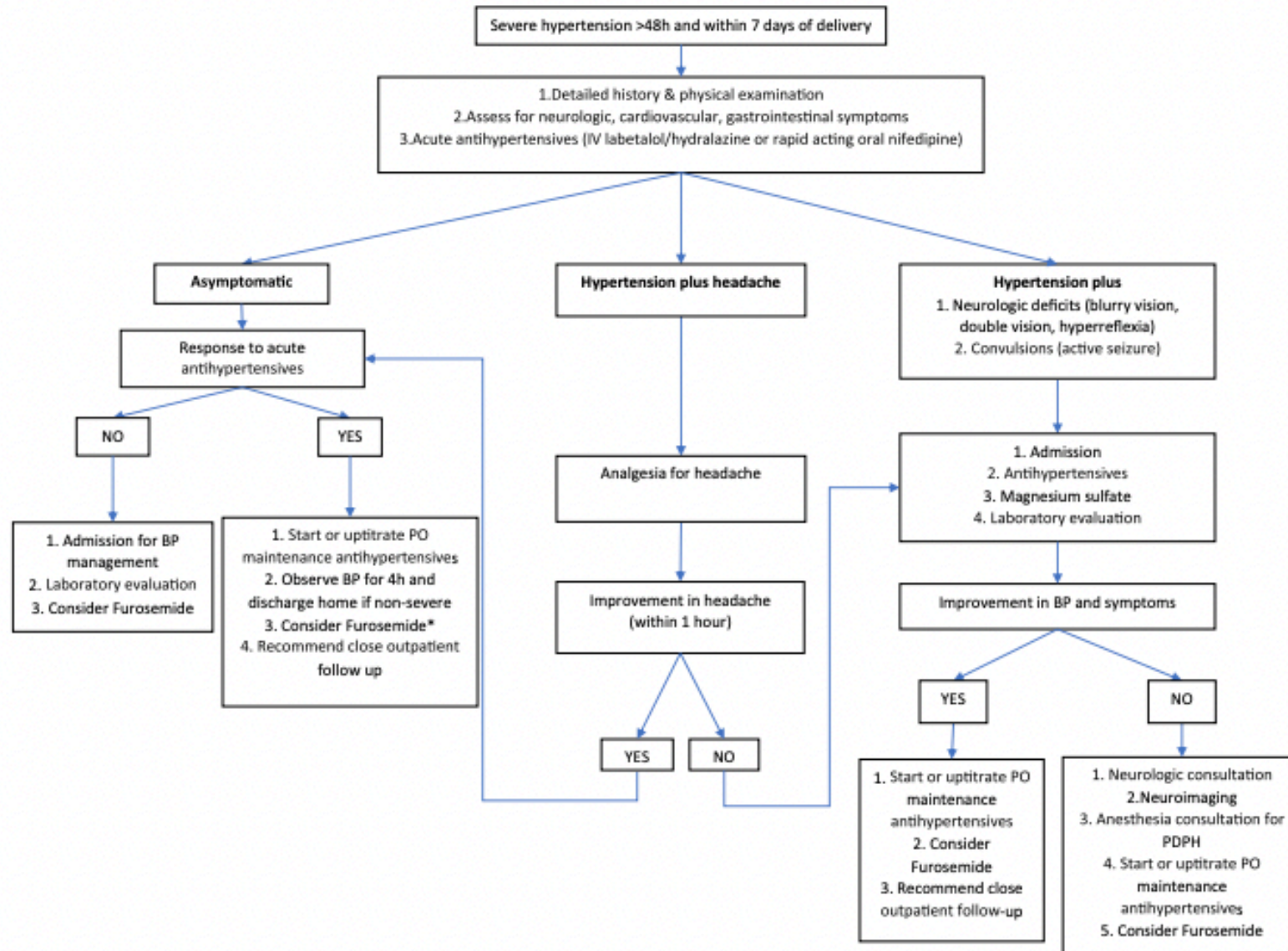




## **Is magnesium sulfate therapy warranted in all cases of late postpartum severe hypertension? A suggested approach to a clinical conundrum**

Kristen Cagino, MD; Malavika Prabhu, MD; Baha Sibai, MD

- Antenatal preeclampsia with severe features: NNT 71
- Largest case series of eclampsia >48 hours: 45/54 had prodromal CNS symptoms
- Recommendations:
  - only check labs if symptomatic
  - Only administer magnesium sulfate for severe HTN plus persistent neurologic symptoms within 1 week postpartum

**FIGURE 1****Algorithm for the evaluation and management of late postpartum severe hypertension without symptoms and with neurologic symptoms**

BP, blood pressure; IV, intravenous; PDPH, postdural puncture headache; PO, per oral.

Cagino. Magnesium sulfate prophylaxis for late-postpartum severe hypertension. *Am J Obstet Gynecol* 2023.

# Ongoing care

20-30% persist

Transition to  
"non-pregnant"  
medication

Increased lifelong  
cardiovascular  
risk



# Future directions:

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- Enalapril?
- Improved access to Telehealth?



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Thank You!  
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