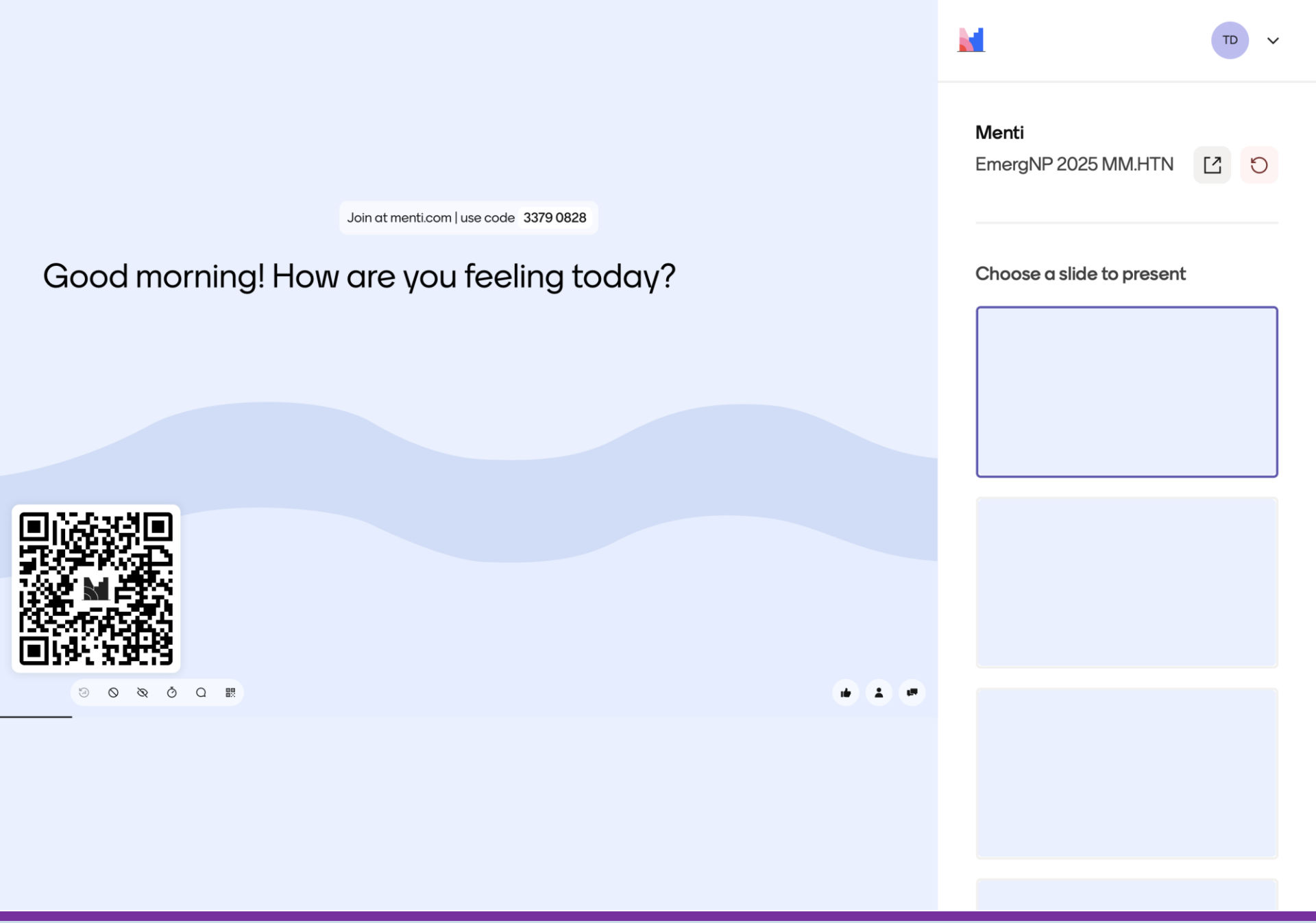
Don’t Ask, Don’t Tell!

Pregnancy-Related, Hypertensive Emergencies That Are Easy to Miss.

Toni Dobson, MSN, APRN, FNP-C, ENP-C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Good morning! How are you feeling today?
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HTN: What numbers worry you?

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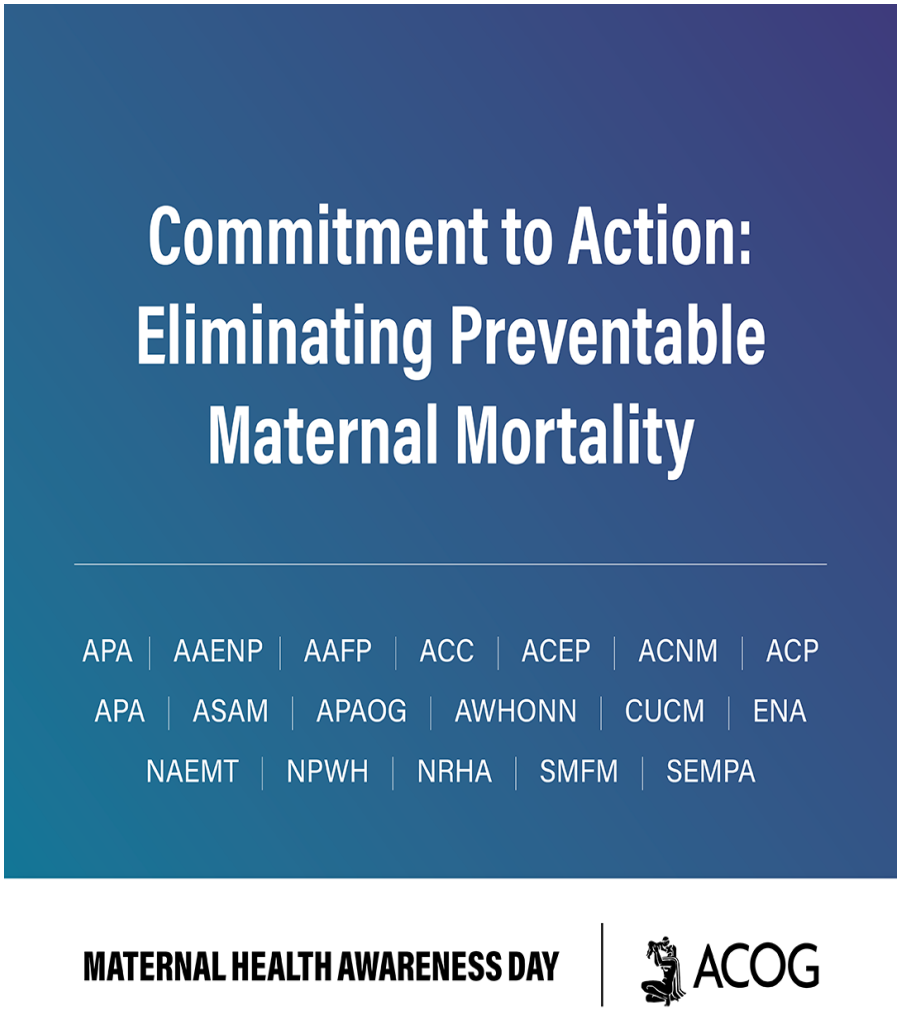
Program Goals

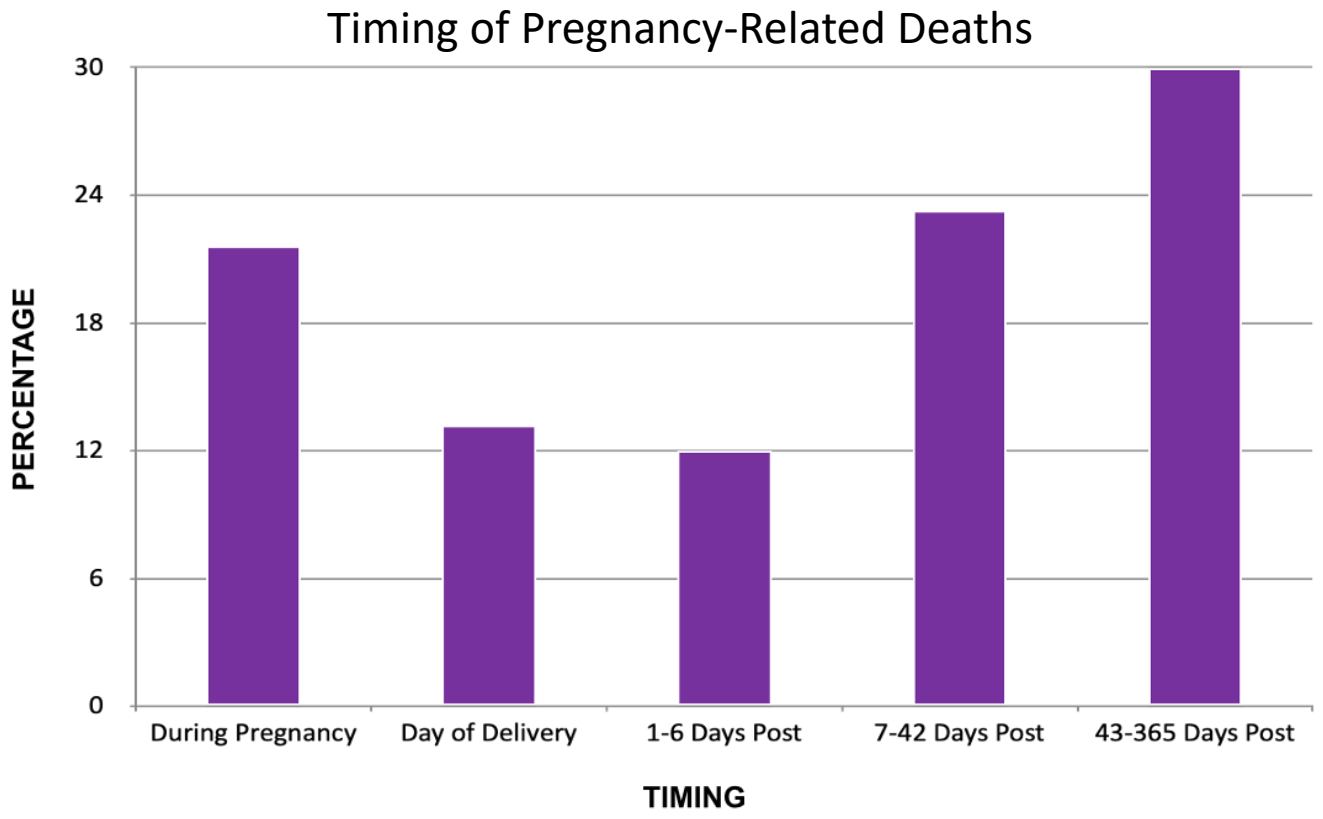
- Increase awareness of the critical role of non-obstetric health care practitioners in recognizing and managing obstetric emergencies.
- Improve identification of patients who are pregnant or have been pregnant in the last 12 months.
- Enhance recognition of signs and symptoms of obstetric emergencies and readiness to stabilize or treat patients who present outside the obstetric setting.



Objectives

- Develop a method to identify this at-risk population of women.
- Define mild and severe range blood pressure and identify what requires urgent management.
- Discuss which medications would be appropriate for the management of severe range blood pressures.
- Identify where providers can find resources for the management of hypertension in pregnancy.

Identify the Population



Add this Question to your HPI

Are you pregnant now or have you been pregnant in the last 365 days?

HTN in pregnancy

- Affects 16% of pregnancies
- 31.6% of maternal deaths had a Dx of HTN
- HTN: short-term and long-term effects for mom and baby
- Emergent HTN: 20 weeks – 6 weeks PP

Hypertensive Disorders of Pregnancy

- Chronic Hypertension
- Gestational Hypertension
- Pre-eclampsia
- Eclampsia
- HELLP Syndrome

Hypertension in Pregnancy

- Mild Range Hypertension: 140/90 - 159/109
- Severe Range Hypertension: 160/110 or Greater

HTN Emergency in Pregnancy

160/110

158/112 192/90

Case #1

24 y/o F

G1P0 at 37w3d

CC: Headache x2 days

VS: BP 149/90; Resp 16; HR 104; Temp 98.9

PE: +2 pitting pedal edema

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What are you going to include in your DDx?

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Pre-Eclampsia

- Pre-Eclampsia (without Severe Features)
- Pre-Eclampsia with Severe Features

Severe Features

- Serum Abnormalities
  - Platelets < 100
  - LFTs Double or Greater
  - Creatinine Double Baseline or 1.1 and Above
- Symptoms/Exam Findings
  - Headache Unimproved with Tylenol
  - Visual Disturbances
  - RUQ or Epigastric Pain
  - Pulmonary Edema
  - Severe Range BP

Pre-Eclampsia (without Severe Features)

- Mild Hypertension and Proteinuria (protein creatinine ratio 0.3 or greater, UA dip 2+ proteinuria, 24h urine 300 or greater)
- No Serum Abnormalities
- No Concerning Sxs

Pre-Eclampsia with Severe Features

- HTN and a SF (proteinuria does not have to be present)
- Severe Features
  - Severe Range BPs
  - Serum Lab Abnormalities: plat <100, LFTs Doubled, Creatinine Double Baseline or 1.1 and Above
  - Concerning Sxs: HA Unimproved with Tylenol, RUQ or Epigastric Pain, Visual Disturbances

Acute Hypertension Algorithm

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Acute Hypertension in Pregnancy & Postpartum Algorithm

Ask the patient:

"Are you pregnant or have you been pregnant in the last 6 weeks?"

If yes, these symptoms may be related to pregnancy and can occur up to 6 weeks postpartum.

≥20 weeks pregnant **OR** ≤6 weeks postpartum
AND
SBP ≥ 140 or DBP ≥ 90 (with normal BP previously):
- Monitor BP every 15 minutes for up to 4 hours
- Assess for signs/symptoms ***(see Box 1)***
- Consider obtaining labs ***(see Box 2)***

NOTE: If at any time the SBP ≥ 160 or DBP ≥ 110, confirm in 15 minutes and then *proceed directly to "Preeclampsia with severe features" box* — do NOT wait to initiate therapy.

Box 1

Potential Signs/Symptoms
- New-onset headache
- Visual disturbances
- RUQ or epigastric pain
- Shortness of breath; pulmonary edema
- Oliguria
- **If your pregnant or postpartum patient has hypertension and severe headache, consider STROKE.**

Box 2

Labs to Consider
- CBC
- AST, ALT
- Serum creatinine
- Urine protein:
  - Urine protein/creatinine ratio
  - Urine dipstick if 24-hour urine protein or protein/creatinine ratio is not available

Imaging to Consider
- Head CT if severe headache or any neurological symptoms

- SBP < 140 and DBP < 90
- Normal labs
- No symptoms

"Normal"
- No acute treatment required
- Create plan for follow-up BP assessment and OB follow-up

SBP 140–159 or DBP 90–109 persisting for 4 hours

NOTE: If at any time during monitoring, the SBP ≥ 160 or DBP ≥ 110, confirm in 15 minutes and refer to *"Preeclampsia with severe features" box* — do NOT wait for 4 hours to initiate therapy.

- SBP 140–159 or DBP 90–109
- Normal labs
- No symptoms

Gestational Hypertension

Management
- Serial BP (q 15 minutes) for 1 hour
- If ≥37 weeks, consult OB for delivery planning
- If <37 weeks, arrange for prompt OB follow-up and provide explicit return precautions (patient at high risk for preeclampsia)

- SBP 140–159 or DBP 90–109, **AND** proteinuria
- Urine protein/creatinine ratio: ≥0.3
- Urine dipstick: ≥2+

Preeclampsia

Management
- Serial BP (q 15 minutes)
- OB consultation
- Observe for preeclampsia with severe features, HELLP syndrome, and/or hypertensive emergency

- SBP ≥ 160 or DBP ≥ 110 ***(see NOTE below)***
  OR
- SBP 140–159 or DBP 90–109 plus **ANY** lab abnormalities or symptoms:
  - Thrombocytopenia (platelet count < 100 x 10^9/L
  - Transaminases elevated to 2x upper limit of normal
  - Persistent/severe RUQ or epigastric pain
  - Serum creatinine > 1.1 mg/dL or doubling of serum creatinine in absence of other renal disease
  - Pulmonary edema
  - New-onset headache unresponsive to medications and not otherwise explained
  - Visual disturbances

NOTE: SBP ≥ 160 or DBP ≥ 110 is considered a hypertensive emergency and constitutes preeclampsia with severe features regardless of symptoms or lab abnormalities — severe hypertension should be confirmed within 15 minutes to initiate antihypertensive therapy *(see Box 3)* — DO NOT WAIT 4 HOURS TO CONFIRM SEVERE BP ELEVATION.

Preeclampsia with Severe Features

Management
- **Initiate antihypertensives if persistent SBP ≥ 160 or DBP ≥ 110 *(see Box 3)***
- Serial BP (q 15 minutes)
- OB evaluation or transfer to a facility with OB capability
- Observe for HELLP syndrome, and/or hypertensive emergency
- Initiate magnesium sulfate therapy ***(see Box 4)***

Box 3

Treatment Recommendations for Sustained Systolic BP ≥ 160 mm Hg OR Diastolic BP ≥ 110 mm Hg*

*Antihypertensive treatment and magnesium sulfate should be administered simultaneously. If concurrent administration is not possible, antihypertensive treatment should be first priority.

Management Considerations — Choose any of the three agents as primary antihypertensive but consider the following:
- If no IV access initially, choose nifedipine.
- If the patient has a history of asthma **OR** is bradycardic, choose hydralazine or nifedipine as the initial agent.

Labetalol IV as Primary Antihypertensive	Hydralazine IV as Primary Antihypertensive	Nifedipine PO as Primary Antihypertensive
Initial dose: 20 mg labetalol IV over 2 minutes	Initial dose: 5–10 mg hydralazine IV over 2 minutes	Initial dose: nifedipine 10 mg PO immediate release (IR)
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Target BP: 130–150/80–100 mm Hg
Once BP threshold is achieved, stop antihypertensives and monitor BP:
- Q10 minutes for 1 hour then → Q15 minutes for 1 hour then → Q30 minutes for 1 hour then → Q1 hour for 4 hours
- If at any point BP ≥ 160/110, readminister antihypertensives.

Adapted from Druzin ML, Shields LE, Peterson NL, Sakowski C, Cape V, Morton CH. Improving Health Care Response to Hypertensive Disorders of Pregnancy, a California Maternal Quality Care Collaborative Quality Improvement Toolkit, 2021.

Box 4

Magnesium Sulfate Treatment
- Loading dose: 4–6 g IV over 20–30 minutes
- Maintenance dose: 1–2 g/h
- See Eclampsia Algorithm if IV access cannot be established or if patient has altered renal function
- Be aware of potential magnesium toxicity. For more information, see Eclampsia Algorithm.

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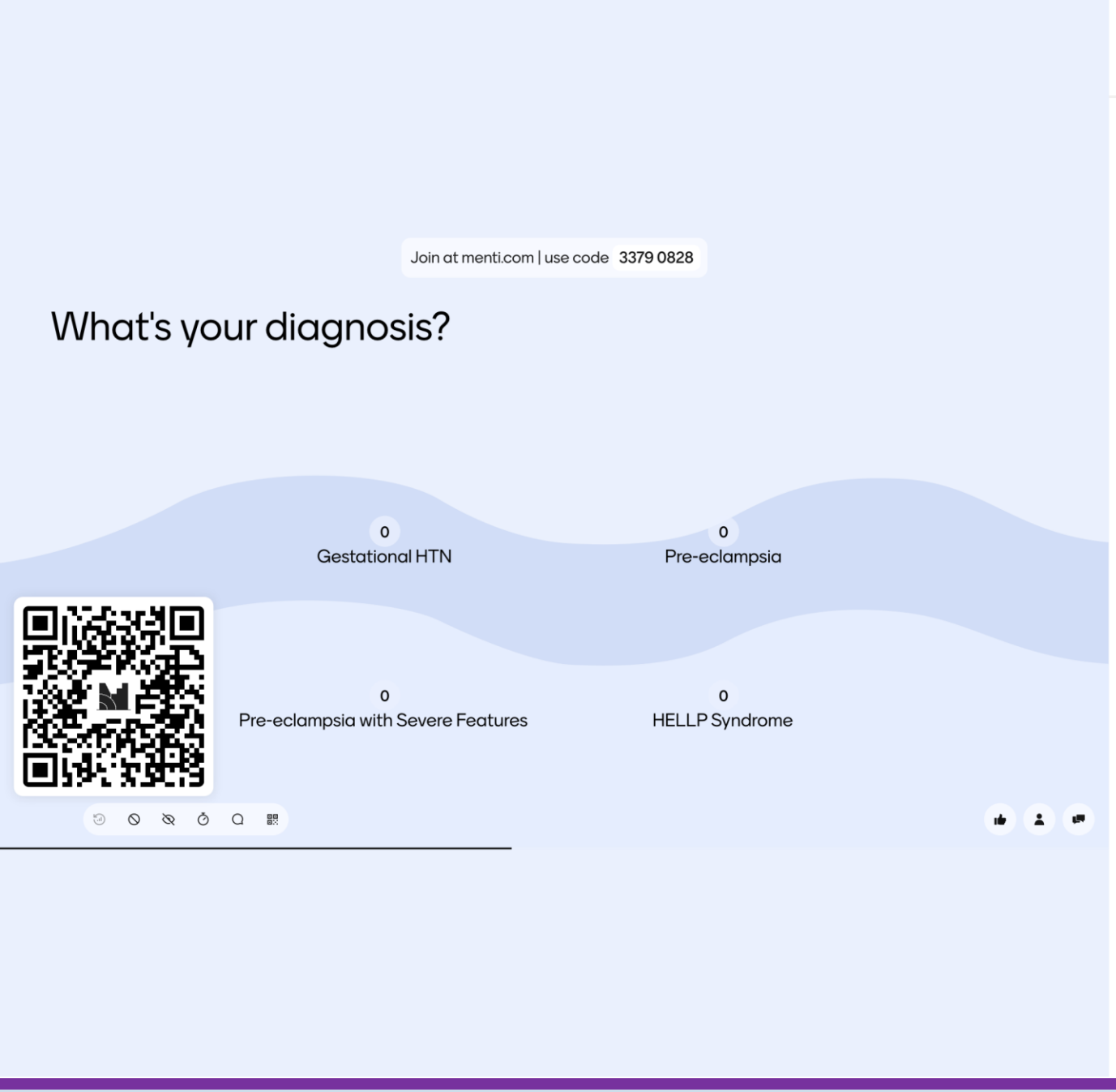
Management

- Monitor BP q15m
- FHTs or NST
- Consult Algorithm
- Treat her HA with Tylenol
- Get labs: CBC, CMP, UA, Urine Protein Creatinine Ratio
- Results
  - CBC: H&H 12&36, Plat 168
  - CMP: Creatinine 0.5, AST 34, ALT 30
  - UA: 2+ Protein
  - Urine PCR: 0.45
  - Patient reports her HA improved with Tylenol



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Case #2

32 y/o F

CC: RUQ abd pain, N/V x1 day

VS: BP 176/98; Resp 20; HR 120; Temp 99.1

PE: Pt looks uncomfortable

RUQ tenderness with +Murphy

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What else do you want to know?

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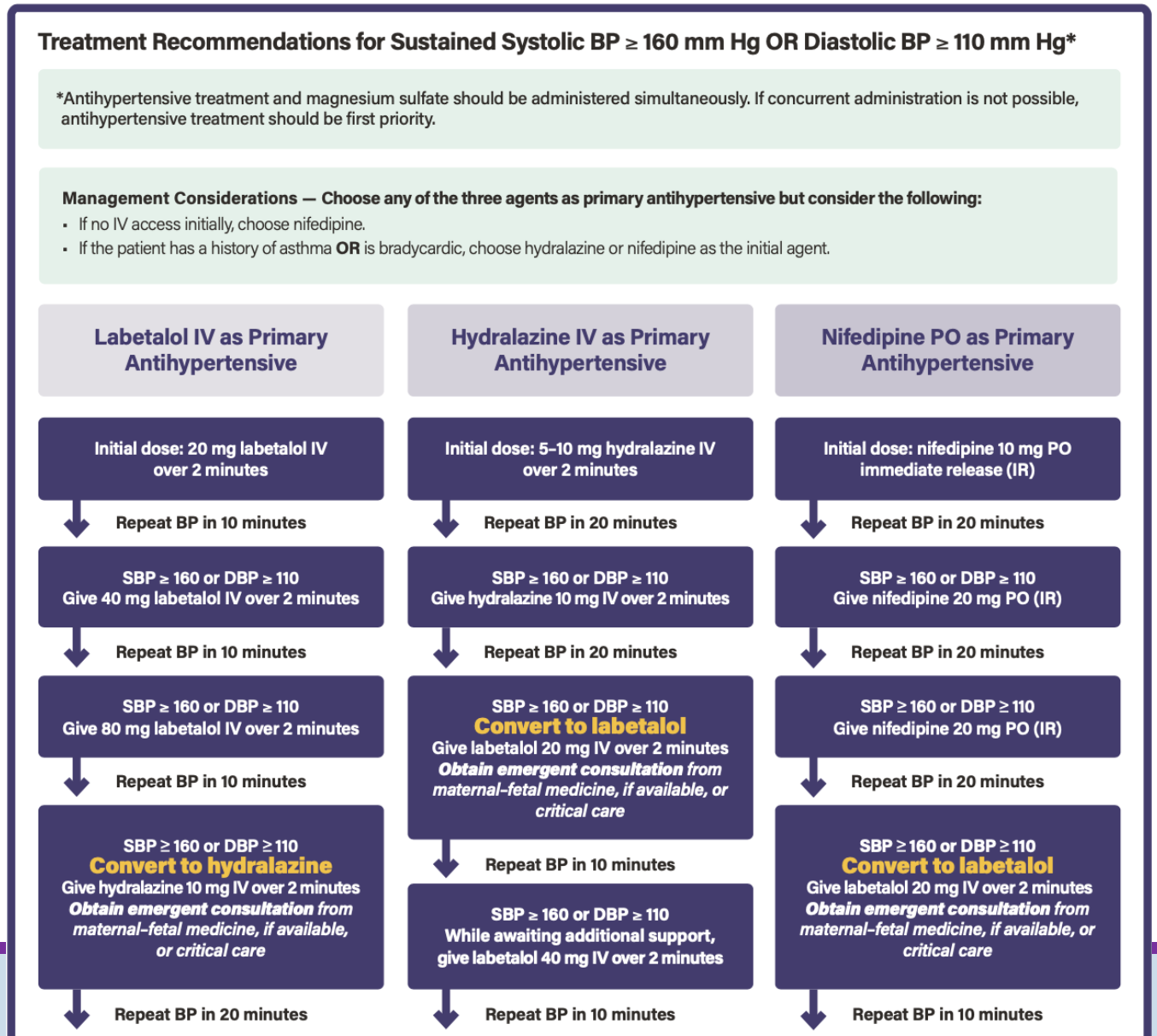
Severe Range BP Management

- Patients greater than 20 weeks and within first six weeks PP
- After 2 Consecutive Severe Range BPs, give Antihypertensive
  - Monitor BP q15m
  - Consult Algorithm
  - Follow Algorithm until Severe Range BPs are Resolved
  - Start Magnesium

Acute Hypertension Algorithm

Box 3



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Lab Results

- CBC: H&H 10&30, Plat 98
- CMP: Creatinine 0.9, AST 50, ALT 62
- Lipase: 60
- UA: 3+ Protein
- Urine PCR: 0.8
- RUQ US: Negative

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Box 4

Magnesium Sulfate Treatment
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- See Eclampsia Algorithm if IV access cannot be established or if patient has altered renal function
- Be aware of potential magnesium toxicity. For more information, see Eclampsia Algorithm.

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Pre-E with SF Management

- Aggressive Management of BP
- Start Magnesium
- Consult OB
- Admit

Case #3

25 y/o F

CC: Arrives via EMS, awake but post ictal.

EMS report: Found seizing at home. Sz stopped before they could give meds. Post ictal since. No hx of sz. No trauma. Family OTW.

VS: BP 202/102; Resp 24; HR 125; Temp 98.9

PE: Pt is confused seems post ictal

Generalized abdominal tenderness

3+ pitting pedal edema

DTRs 4+, 2 beats clonus BL

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Mentimeter

What is your first priority for this patient?

BP Control	Magnesium	Head CT	FHTs/NST
0	0	0	0

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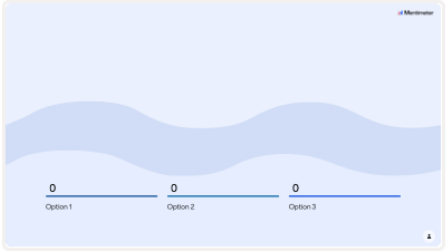

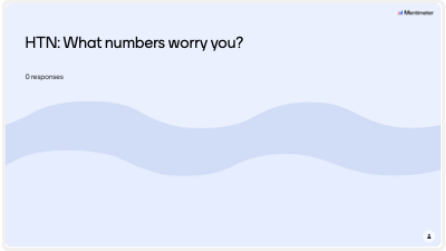

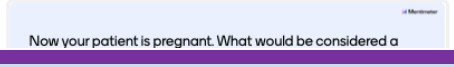

Eclampsia Algorithm

Eclampsia Algorithm

Known or suspected pregnancy
OR
Possible pregnancy within the last 6 weeks

Initial Intervention: Presumed Eclamptic Seizure

- Perform usual seizure patient care
- If pregnant, try to position patient in left lateral decubitus position, head of bed down
- Prepare to initiate medical therapy
- Request immediate obstetric consultation

Administer Magnesium Sulfate

First-line therapy for suspected eclamptic seizure

If no IV access (not available or cannot be established):

- Administer magnesium sulfate intramuscularly (IM) — 10–g loading dose (5 g in each buttock) followed by 5 g IM every 4 hours
- The medication can be mixed with 1 mL of a 2% xylocaine solution to reduce discomfort
- There are no data on IO administration of magnesium sulfate in eclamptic seizures

Magnesium Initial Treatment

1) **Loading dose:** 4–6 g IV over 20–30 minutes, then start maintenance dose
2) **Maintenance dose:** 1–2 g/h

If altered renal function (creatinine ≥ 1 mg/dL), maintenance dosing of magnesium will need to be adjusted. Consult pharmaceutical reference or request guidance from obstetric consultant for specifics.

Persistent or recurrent seizure after magnesium sulfate loading dose:

Continue magnesium sulfate maintenance infusion, administer one of the following medications, and prepare for possible intubation

Preferred next medication class: benzodiazepines

- **Lorazepam** 4 mg IV over 3–5 minutes, **OR**
- **Diazepam** 5–10 mg IV slowly
- **If no IV access**, can administer **midazolam** 10 mg IM

If still seizing:

- **Fosphenytoin** 20 mg PE/kg IV at 150 mg PE/min

If persistent,

- **Levetiracetam** 60 mg/kg IV, max 4,500 mg
- Consider intubation with **propofol** and consultation with neurology, anesthesia, critical care, or maternal–fetal medicine.

Resolution of Seizure

1) **Assess BP — if SBP ≥ 160 or DBP ≥ 110, initiate Acute Hypertension Algorithm**
2) **OB evaluation ASAP**
3) If seizure responds to magnesium sulfate and the patient is maintained on magnesium sulfate (and unable to be urgently transported to an obstetric unit for further evaluation and treatment):
   a. Continue magnesium sulfate infusion at 1–2 g/h
   b. Monitor serum magnesium levels every 4 hours (first level at 4 hours after therapy initiated — therapeutic range: 4.9–8.5 mg/dL)
   c. Observe for possible toxicity ***(see Box 1)***
4) Maintain magnesium sulfate infusion for at least 24–48 hours after the last seizure or after delivery, whichever is later
5) Obtain head CT
6) Perform thorough neurological examination to evaluate for focal deficits
7) Preparation should be made for delivery, as applicable; mode and timing of delivery depend on obstetric circumstances
8) For potential magnesium toxicity:
   a. **If serum magnesium > 9.6 mg/dL, the infusion should be stopped**
   b. Re-start when the level decreases to <8.4 mg/dL
   c. Calcium gluconate or calcium chloride should be readily available for impending respiratory depression
      - Calcium gluconate: 10% solution, 10 mL (1,000 mg or 1 g) IV over 3 minutes
      - Calcium chloride: 10% solution, 5 mL (500 mg) IV over 5–10 minutes

Box 1

Serum Magnesium Concentration

Range (mg/dL)	Effect
4.9–8.5	Therapeutic range for seizure prophylaxis
8.5–12.2	Loss of deep tendon reflexes
12.2–15.8	Respiratory paralysis
>18.2	Altered cardiac conduction
>30	Cardiac arrest

Data from Chau AT. Magnesium toxicity. In: McEvoy MD, Furse CM, editors. Advanced perioperative crisis management. Oxford Academic; 2017. p. 431-5.

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AAENP American Academy of Emergency Nurse Practitioners

American College of Emergency Physicians Advancing Emergency Care

ENA Emergency Nurses Association

Society of Emergency Medicine Physician Assistants

Eclampsia Management

- Monitor BP q5m
- Consult Algorithms
- Start Magnesium Immediately
- Aggressive Management of BP
- CT Head
- Get Labs: CBC, CMP, UA, Urine Protein Creatinine Ratio
  - CBC: H&H 9&28, Plat 215
  - CMP: Creatinine 1.2, AST 214, ALT 330
  - UA: 4+
  - Urine PCR: 10
- Consult OB/MFM
- Admit

Case #4

25 y/o F from Ukraine, non-English speaking

CC: “Not feeling well” and swelling

VS: BP 182/98; Resp 18; HR 105; Temp 97.7

PE: Generalized edema, 3+ pitting pedal edema

Mild RUQ abdominal tenderness

Fundal height just above the umbilicus

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Mentimeter

What are the initial steps in management for this patient?

All responses to your question will be shown here

Each response can be up to 200 characters long

Turn on voting to let participants vote for their favorites

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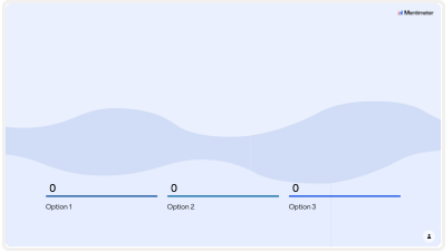

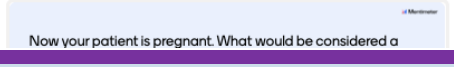

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- Assess for signs/symptoms ***(see Box 1)***
- Consider obtaining labs ***(see Box 2)***

NOTE: If at any time the SBP ≥ 160 or DBP ≥ 110, confirm in 15 minutes and then *proceed directly to "Preeclampsia with severe features" box* — do NOT wait to initiate therapy.

Box 1

Potential Signs/Symptoms
- New-onset headache
- Visual disturbances
- RUQ or epigastric pain
- Shortness of breath; pulmonary edema
- Oliguria
- **If your pregnant or postpartum patient has hypertension and severe headache, consider STROKE.**

Box 2

Labs to Consider
- CBC
- AST, ALT
- Serum creatinine
- Urine protein:
  - Urine protein/creatinine ratio
  - Urine dipstick if 24-hour urine protein or protein/creatinine ratio is not available

Imaging to Consider
- Head CT if severe headache or any neurological symptoms

- SBP < 140 and DBP < 90
- Normal labs
- No symptoms

"Normal"
- No acute treatment required
- Create plan for follow-up BP assessment and OB follow-up

SBP 140–159 or DBP 90–109 persisting for 4 hours

NOTE: If at any time during monitoring, the SBP ≥ 160 or DBP ≥ 110, confirm in 15 minutes and refer to *"Preeclampsia with severe features" box* — do NOT wait for 4 hours to initiate therapy.

- SBP 140–159 or DBP 90–109
- Normal labs
- No symptoms

Gestational Hypertension

Management
- Serial BP (q 15 minutes) for 1 hour
- If ≥37 weeks, consult OB for delivery planning
- If <37 weeks, arrange for prompt OB follow-up and provide explicit return precautions (patient at high risk for preeclampsia)

- SBP 140–159 or DBP 90–109, **AND** proteinuria
- Urine protein/creatinine ratio: ≥0.3
- Urine dipstick: ≥2+

Preeclampsia

Management
- Serial BP (q 15 minutes)
- OB consultation
- Observe for preeclampsia with severe features, HELLP syndrome, and/or hypertensive emergency

- SBP ≥ 160 or DBP ≥ 110 ***(see NOTE below)***
  OR
- SBP 140–159 or DBP 90–109 plus **ANY** lab abnormalities or symptoms:
  - Thrombocytopenia (platelet count < 100 x 10^9/L
  - Transaminases elevated to 2x upper limit of normal
  - Persistent/severe RUQ or epigastric pain
  - Serum creatinine > 1.1 mg/dL or doubling of serum creatinine in absence of other renal disease
  - Pulmonary edema
  - New-onset headache unresponsive to medications and not otherwise explained
  - Visual disturbances

NOTE: SBP ≥ 160 or DBP ≥ 110 is considered a hypertensive emergency and constitutes preeclampsia with severe features regardless of symptoms or lab abnormalities — severe hypertension should be confirmed within 15 minutes to initiate antihypertensive therapy *(see Box 3)* — DO NOT WAIT 4 HOURS TO CONFIRM SEVERE BP ELEVATION.

Preeclampsia with Severe Features

Management
- **Initiate antihypertensives if persistent SBP ≥ 160 or DBP ≥ 110 *(see Box 3)***
- Serial BP (q 15 minutes)
- OB evaluation or transfer to a facility with OB capability
- Observe for HELLP syndrome, and/or hypertensive emergency
- Initiate magnesium sulfate therapy ***(see Box 4)***

Box 3

Treatment Recommendations for Sustained Systolic BP ≥ 160 mm Hg OR Diastolic BP ≥ 110 mm Hg*

*Antihypertensive treatment and magnesium sulfate should be administered simultaneously. If concurrent administration is not possible, antihypertensive treatment should be first priority.

Management Considerations — Choose any of the three agents as primary antihypertensive but consider the following:
- If no IV access initially, choose nifedipine.
- If the patient has a history of asthma **OR** is bradycardic, choose hydralazine or nifedipine as the initial agent.

Labetalol IV as Primary Antihypertensive	Hydralazine IV as Primary Antihypertensive	Nifedipine PO as Primary Antihypertensive
Initial dose: 20 mg labetalol IV over 2 minutes	Initial dose: 5–10 mg hydralazine IV over 2 minutes	Initial dose: nifedipine 10 mg PO immediate release (IR)
Repeat BP in 10 minutes	Repeat BP in 20 minutes	Repeat BP in 20 minutes
SBP ≥ 160 or DBP ≥ 110 Give 40 mg labetalol IV over 2 minutes	SBP ≥ 160 or DBP ≥ 110 Give hydralazine 10 mg IV over 2 minutes	SBP ≥ 160 or DBP ≥ 110 Give nifedipine 20 mg PO (IR)
Repeat BP in 10 minutes	Repeat BP in 20 minutes	Repeat BP in 20 minutes
SBP ≥ 160 or DBP ≥ 110 Give 80 mg labetalol IV over 2 minutes	SBP ≥ 160 or DBP ≥ 110 **Convert to labetalol** Give labetalol 20 mg IV over 2 minutes ***Obtain emergent consultation** from maternal-fetal medicine, if available, or critical care*	SBP ≥ 160 or DBP ≥ 110 Give nifedipine 20 mg PO (IR)
Repeat BP in 10 minutes	Repeat BP in 10 minutes	Repeat BP in 20 minutes
SBP ≥ 160 or DBP ≥ 110 **Convert to hydralazine** Give hydralazine 10 mg IV over 2 minutes ***Obtain emergent consultation** from maternal-fetal medicine, if available, or critical care*	SBP ≥ 160 or DBP ≥ 110 While awaiting additional support, give labetalol 40 mg IV over 2 minutes	SBP ≥ 160 or DBP ≥ 110 **Convert to labetalol** Give labetalol 20 mg IV over 2 minutes ***Obtain emergent consultation** from maternal-fetal medicine, if available, or critical care*
Repeat BP in 20 minutes	Repeat BP in 10 minutes	Repeat BP in 10 minutes
SBP ≥ 160 or DBP ≥ 110 While awaiting additional support, give hydralazine 10 mg IV over 2 minutes	SBP ≥ 160 or DBP ≥ 110 While awaiting additional support, give labetalol 80 mg IV over 2 minutes	SBP ≥ 160 or DBP ≥ 110 While awaiting additional support, give labetalol 40 mg IV over 2 minutes
		Repeat BP in 10 minutes
		SBP ≥ 160 or DBP ≥ 110 While awaiting additional support, give labetalol 80 mg IV over 2 minutes

Target BP: 130–150/80–100 mm Hg
Once BP threshold is achieved, stop antihypertensives and monitor BP:
- Q10 minutes for 1 hour then → Q15 minutes for 1 hour then → Q30 minutes for 1 hour then → Q1 hour for 4 hours
- If at any point BP ≥ 160/110, readminister antihypertensives.

Adapted from Druzin ML, Shields LE, Peterson NL, Sakowski C, Cape V, Morton CH. Improving Health Care Response to Hypertensive Disorders of Pregnancy, a California Maternal Quality Care Collaborative Quality Improvement Toolkit, 2021.

Box 4

Magnesium Sulfate Treatment
- Loading dose: 4–6 g IV over 20–30 minutes
- Maintenance dose: 1–2 g/h
- See Eclampsia Algorithm if IV access cannot be established or if patient has altered renal function
- Be aware of potential magnesium toxicity. For more information, see Eclampsia Algorithm.

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Management

- Monitor BP q15m
- Consult Algorithm
- Aggressive Management of BP
- Start Magnesium
- Get labs: CBC, CMP, UA, Urine Protein Creatinine Ratio
  - CBC: H&H 10&30, Plat 71
  - CMP: Creatinine 0.9, AST 238, ALT 318
  - UA: 4+ Protein
  - Urine PCR: 10
- FHTs or NST

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What's the diagnosis?

- Gestational HTN
- Pre-Eclampsia
- Pre-Eclampsia with Severe Features
- HELLP Syndrome

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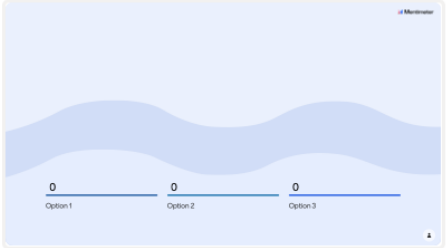
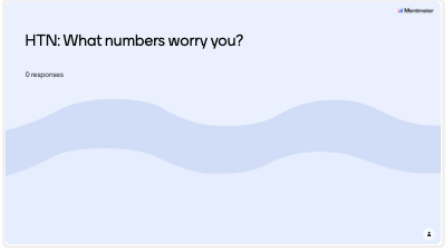
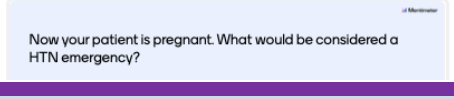






HELLP Management

- Aggressive Management of BP
- Start Magnesium
- Consult OB/MFM
- Admit

Review

- Are you pregnant or have you been pregnant in the last year?
- Mild range BP: 140/90 – 159/109
  Severe range BP: 160/110 or greater.
  Sustained severe range BP in pregnancy 20 weeks or greater and up to 6 weeks postpartum is a hypertensive emergency.
- ACOG recommendations for management of HTN in pregnancy include nifedipine PO, labetalol IV, and hydralazine IV.
- Algorithms for the management of pregnancy related HTN, eclampsia and CVD are available on the ACOG website at https://www.acog.org/programs/obstetric-emergencies-in-nonobstetric-settings

Identifying and Managing Obstetric Emergencies in Nonobstetric Settings

For Emergency Department, EMS, and Urgent Care Practitioners

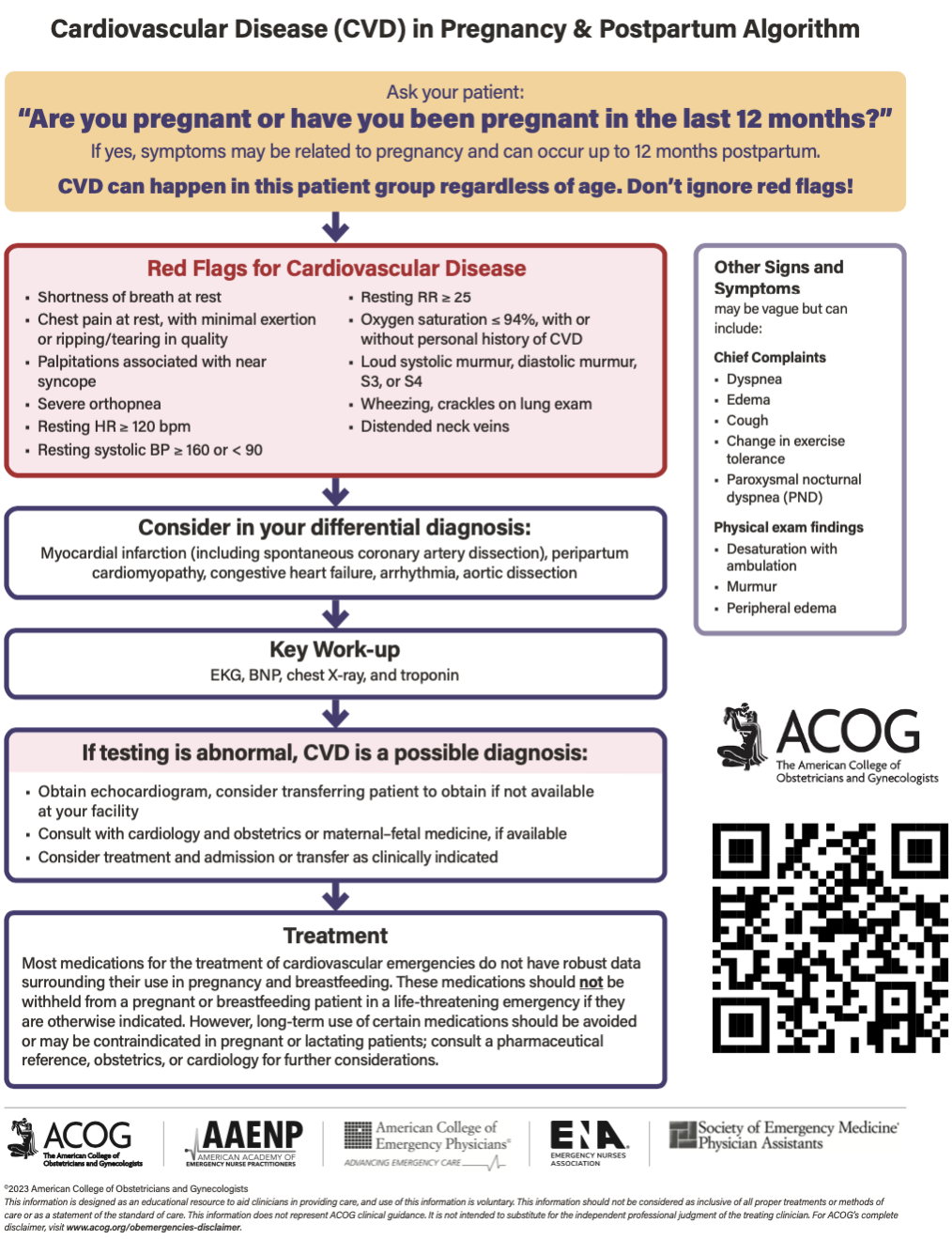
ACOG
The American College of Obstetricians and Gynecologists

Pregnancy-Related Complications and Conditions

Identifying and Managing Obstetric Emergencies in Nonobstetric Settings is a multiyear project to enhance identification and management of pregnancy-related emergencies in nonobstetric settings.

Website: https://www.acog.org/programs/obstetric-emergencies-in-nonobstetric-settings

CVD Algorithm



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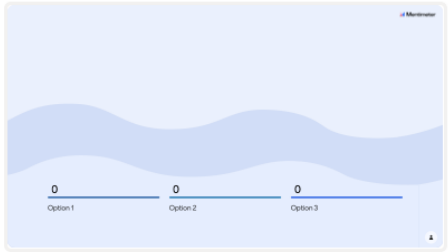

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