tchmb
Texas Collaborative for Healthy Mothers & Babies

Preventing Maternal Mortality and Morbidity

Postpartum Preeclampsia Care in the ED

TCHMB is funded by the Department of State Health Services (DSHS)

50 YEARS TCEP TEXAS COLLEGE of EMERGENCY PHYSICIANS

ENA Texas State Council

University Health

UTHealth Houston School of Public Health

The University of Texas System
THIRTEEN INSTITUTIONS. UNLIMITED POSSIBILITIES.

Disclosures

- Nothing to Disclose

Objectives

1. Illustrate the outcomes of postpartum women in Texas with preeclampsia
2. Discuss the gaps in identification of postpartum women with preeclampsia
3. What Emergency Departments can do to prevent Postpartum Preeclampsia Mortality and Morbidity
4. Outline best practice for timely treatment of postpartum preeclampsia
5. Coordinate transfers utilizing the maternal levels of care structure and regionalization existing within Texas
6. Q &A

The Dallas Morning News

NEWS › PUBLIC HEALTH

Death rates for new Texas moms leap over last two decades

The Institute for Health Metrics a nd Evaluation report broke mat
and racial and ethnic groups

HOUSTON CHRONICLE

Texas' maternal mortality rates have more than doubled since 1999, new report says

Shanieca Holmes-Brown
July 21, 2023 | Updated: July 24, 2023 10:50 a.m.

THE TEXAS TRIBUNE

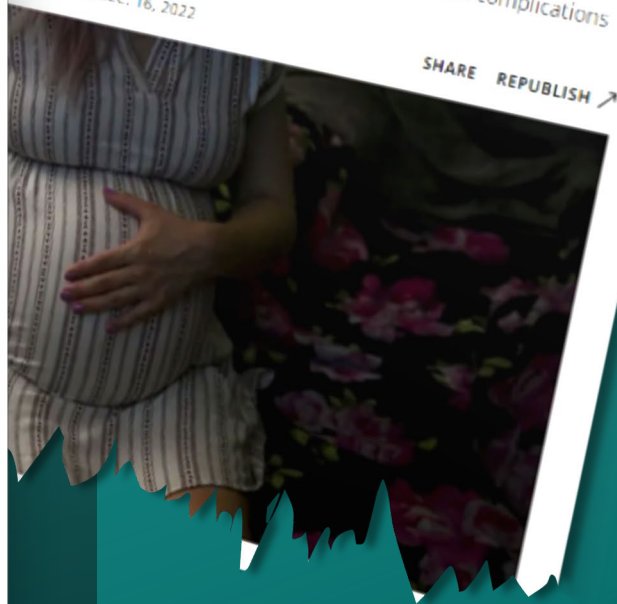
Independent news. Trusted by Texans. Support us.

New Texas maternal mortality report shows disparities persist

The Maternal Mortality and Morbidity Review Committee report, delayed by more than three months, esti
90% of the deaths may have been preventable. Severe complications also increased significantly.

UPDATED: DEC. 16, 2022

SHARE REPUBLISH



WHAT IS HAPPENING?

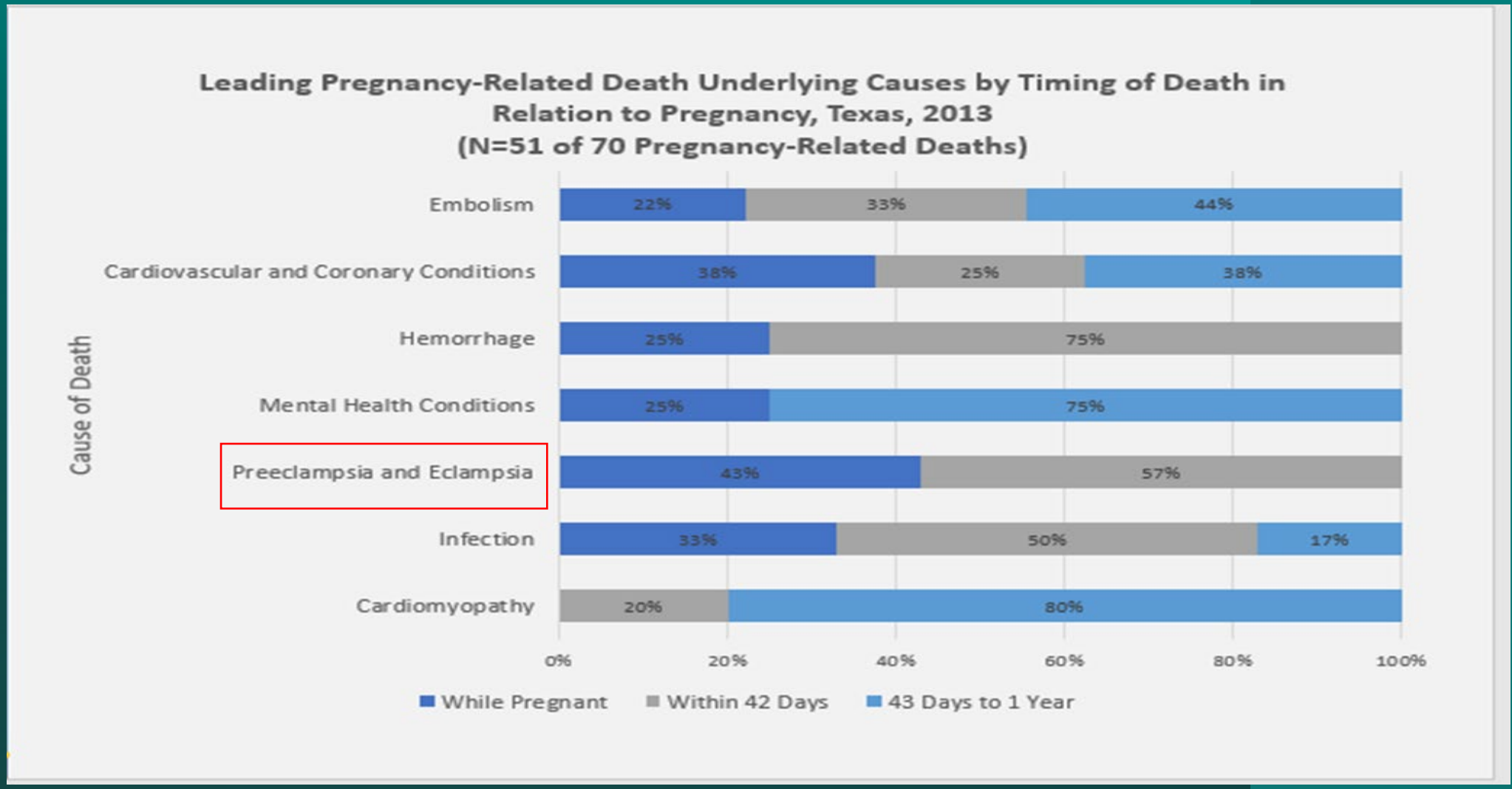
Texas 2019 data revealed

140 CASES OF PREGNANCY ASSOCIATED DEATHS RESULTED IN

7,034 YEARS OF POTENTIAL LIFE LOST BY THE WOMEN WHO DIED	291 LIVING CHILDREN WHO HAVE LOST THEIR MOTHER

Source: https://www.dshs.texas.gov/sites/default/files/legislative/2022-Reports/Letter-to-Governor-Abbott_Infographic-Attachments.pdf

WHEN AND HOW ARE MOTHERS DYING IN TEXAS?

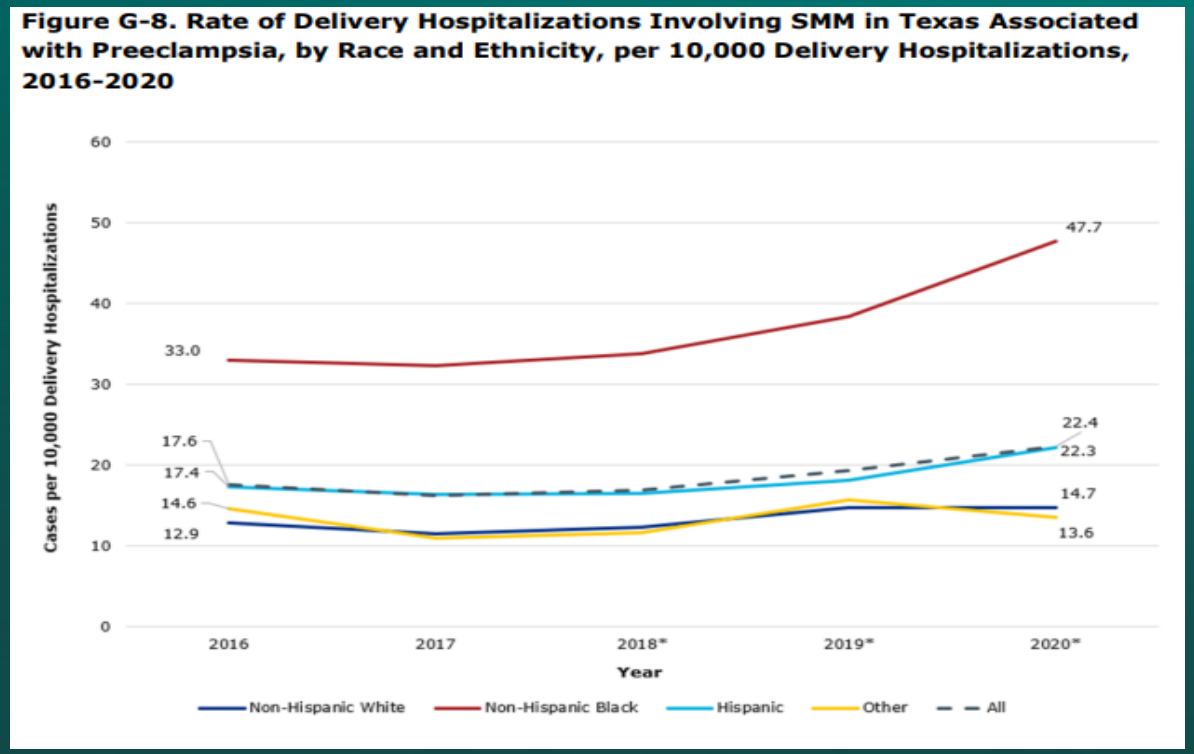


Source: From the Texas Maternal Mortality and Morbidity Review Committee and Department of State Health Services: 2022 Joint Biennial Report

Prepared by: Maternal and Child Health Unit (MCHU), Healthy Texas Mothers and Babies (HTMB) Branch, Community Health Improvement (CHI) Division, the Department of State Health Services (DSHS). Data Source: 2013 Death Files, DSHS Notes: The MMMRC classified deaths as pregnancy-related through the MMMRC review process. For 2013, the MMMRC reviewed 70 pregnancy-related deaths. Amniotic fluid embolism is not included in the embolism grouping due to differences in etiology and opportunities for prevention.

WHO IS MOST AT RISK FOR SEVERE MORBIDITY FROM PREECLAMPSIA?

Figure G-8. Rate of Delivery Hospitalizations Involving SMM in Texas Associated with Preeclampsia, by Race and Ethnicity, per 10,000 Delivery Hospitalizations, 2016-2020



In 2020, Black women were 2x more likely to experience critical health issues –

1.7x more likely to have **hemorrhage-related** health issues.

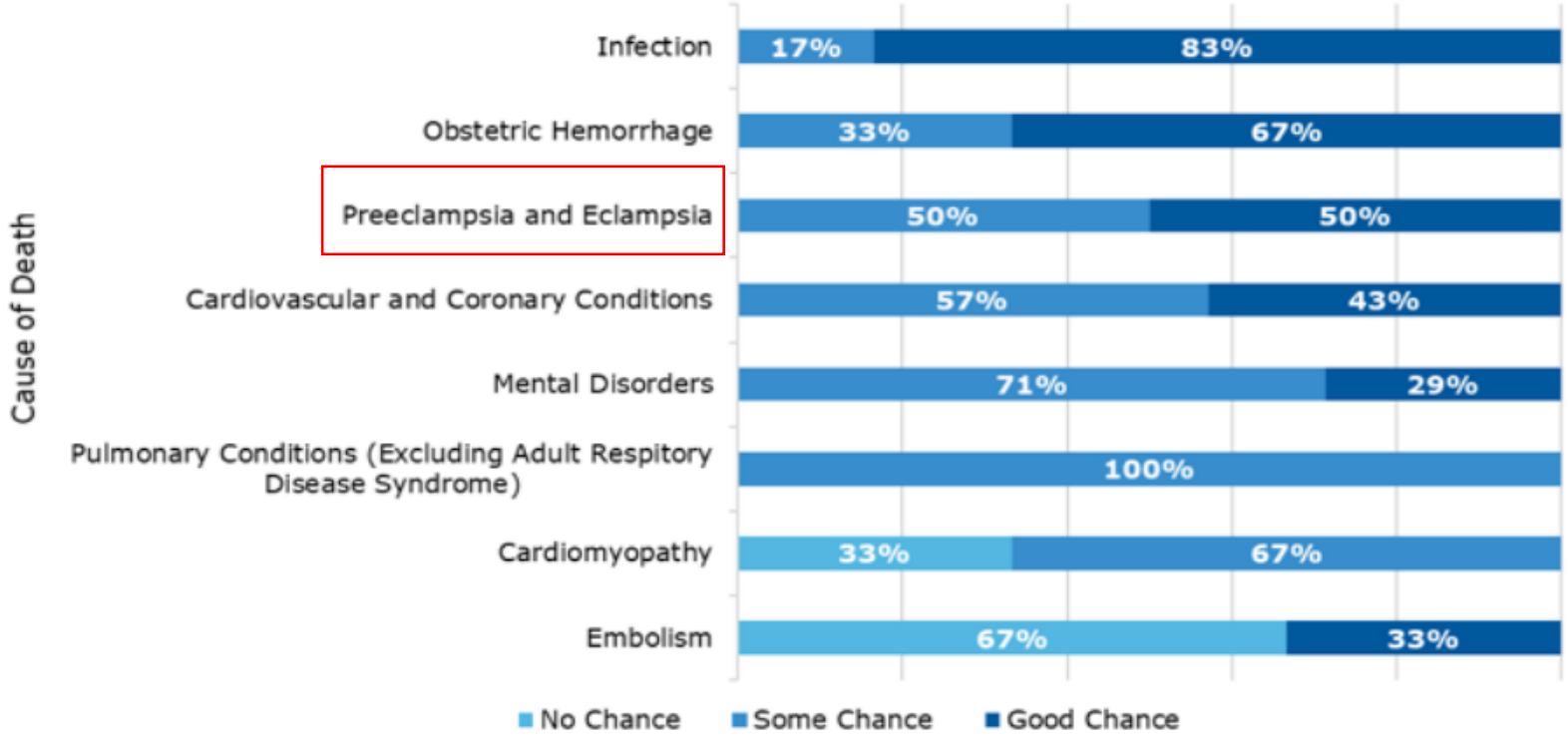
3.2x more likely to have **preeclampsia-related** health issues.

2.3x more likely to have **sepsis-related** health issues.

Source: Texas Maternal Mortality and Morbidity Review Committee and Department of State Health Services: 2022 Joint Biennial Report

IS MATERNAL MORTALITY PREVENTABLE?

Figure 50: Degree of Preventability for Top Underlying Causes of Reviewed Pregnancy-Related Deaths by Rating of Chance to Alter Outcome, Texas, 2013 (Partial Review of Cohort)



n = 44
Source: Texas Maternal Mortality and Morbidity Review Committee and Department of State Health Services Joint Biennial Report, 2020, revised February 2022.
Prepared by: Maternal & Child Health Epidemiology
May 2021

- **100% of preeclampsia and eclampsia cases had at least some chance of preventability in partial review of 2013 and 2019 cohorts.**

Per the published MMMRC/DSHS 2020 Joint Biennial Report regarding the 2013 cohort (shown in graph) and the MMMRC/DSHS 2022 Joint Biennial Report regarding the 2019 cohort.

2022 Texas MMMRC and DSHS Recommendations

Emergency services have been noted in MMMRC reviews to be significant in the circumstances that preceded death.

ED providers knowledge about maternal health, as well as communication and coordination with OB are critical factors in preventing pregnancy related deaths.

Optimize coordination between emergency and maternal health services

Incorporate emergency department representation in existing maternal health and safety programs

Source: DSHS, 2022 Texas Maternal Mortality and Morbidity (MMMRC) and Texas Department of State Health Services (DSHS) 2022 Joint Biennial Report. December 2022

IDENTIFYING POSTPARTUM PATIENTS

IDENTIFYING POSTPARTUM PATIENTS

Ask all women ages 15-45 years, “Are you pregnant, or have you been in the past year?

This questions should be integrated into your EHR and asked on initial contact with the patient.

Source: Florida PQC

IDENTIFYING POSTPARTUM PATIENTS

If a woman has been pregnant in the past year, postpartum complications such as preeclampsia should be added to your differential.

DIAGNOSIS

DIAGNOSIS

Diagnosis	Blood Pressure Criteria	Other Criteria
Preeclampsia without severe features	BP SBP >140 or DBP >90 on two occasional >4 hours apart greater than 20 weeks	AND proteinuria (≥300mg in 24 hours) OR urine p/c ≥ 0.3
Gestational HTN		n/a
Preeclampsia with Severe Features	BP SBP >160 or DBP >110 on two occasional. Can be confirmed in a shorter interval to facilitate timely treatment	Platelets <100K, Cr>1.1 or doubling, LFTs >2x ULN, pulmonary edema, new onset headache not accounted by alternate diagnosis or responsive to medications
Severe Gestational HTN		n/a

DIAGNOSIS

Diagnosis	Blood Pressure Criteria	Other Criteria	Management
Preeclampsia without severe features	BP SBP >140 or DBP >90 on two occasional >4 hours apart greater than 20 weeks	AND proteinuria (≥300mg in 24 hours) or urine p/c ≥ 0.3	• Delivery by 37 weeks
Gestational HTN		n/a	
Preeclampsia with Severe Features	BP SBP >160 or DBP >110 on two occasional. Can be confirmed in a shorter interval to facilitate timely treatment	Platelets <100K, Cr>1.1 or doubling, LFTs >2x ULN, pulmonary edema, new onset headache not accounted by alternate diagnosis or responsive to medications	• Delivery by 34 weeks • Magnesium sulfate during delivery and for 24 hours thereafter
Severe Gestational HTN		n/a	

- 50% with gestational HTN develop preeclampsia
- Most likely when diagnosis is <32 weeks
- Long term cardiovascular risks are the same

POSTPARTUM PREECLAMPSIA

Unknown incidence

Development or worsening of preeclampsia in the postpartum period

Can occur up to 42 days from delivery

CONDITIONS PRECLUDING EXPECTANT MANAGEMENT

Box 4. Conditions Precluding Expectant Management

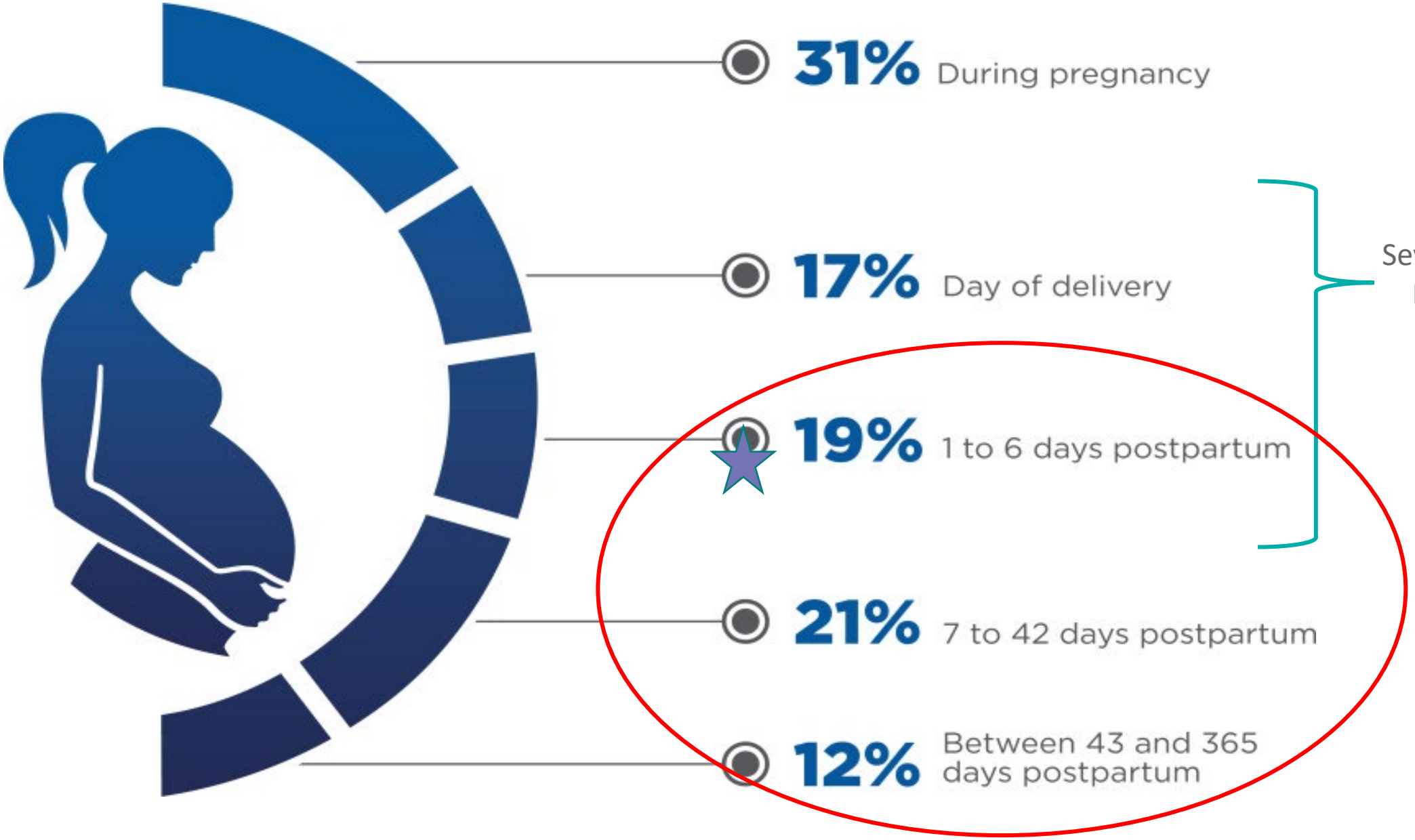
Maternal

- Uncontrolled severe-range blood pressures (persistent systolic blood pressure 160 mm Hg or more or diastolic blood pressure 110 mm Hg or more not responsive to antihypertensive medication
- Persistent headaches, refractory to treatment
- Epigastric pain or right upper pain unresponsive to repeat analgesics
- Visual disturbances, motor deficit or altered sensorium
- Stroke
- Myocardial infarction
- HELLP syndrome
- New or worsening renal dysfunction (serum creatinine greater than 1.1 mg/dL or twice baseline)
- Pulmonary edema
- Eclampsia
- Suspected acute placental abruption or vaginal bleeding in the absence of placenta previa

Fetal

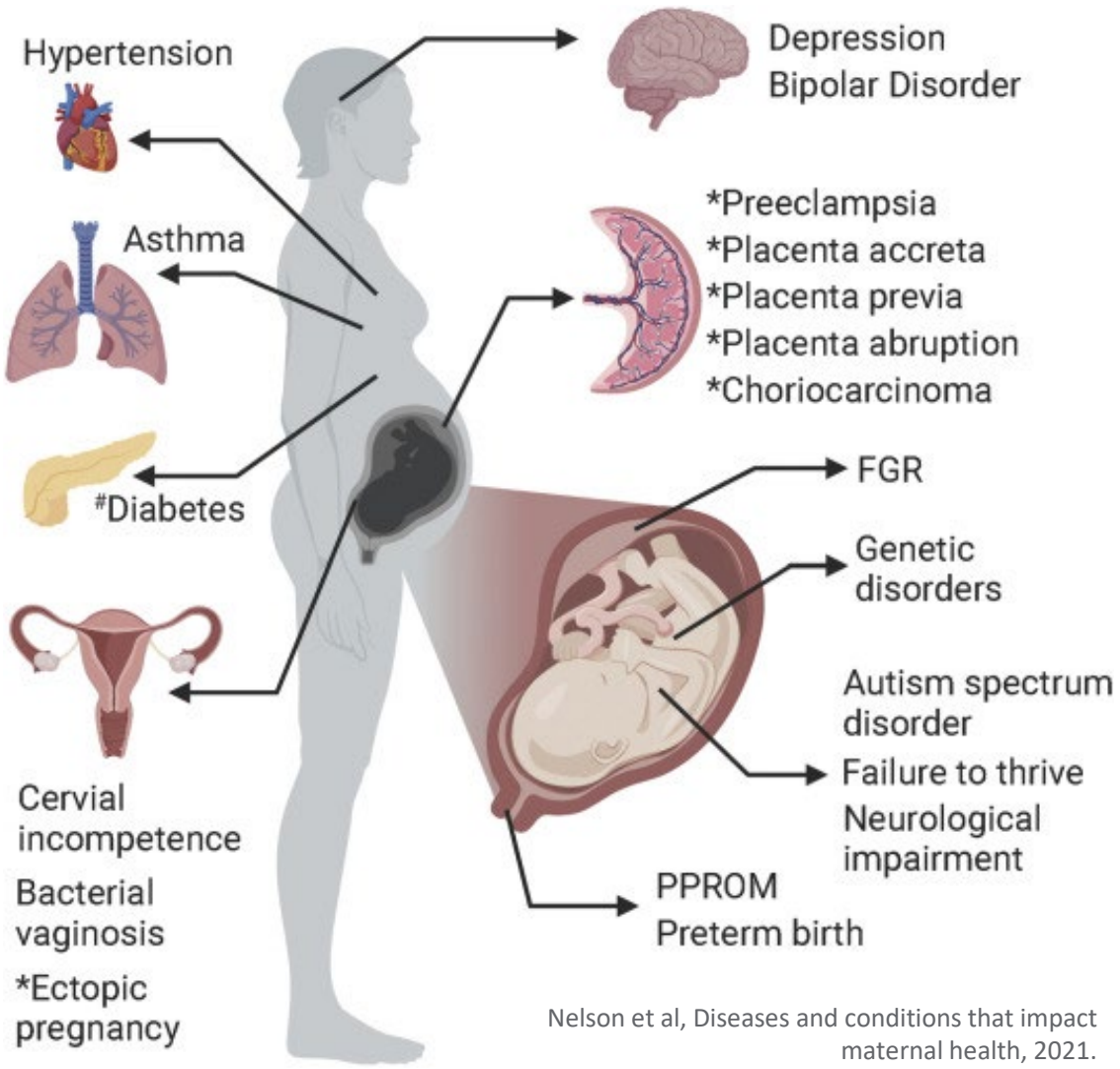
- Abnormal fetal testing
- Fetal death
- Fetus without expectation for survival at the time of maternal diagnosis (eg, lethal anomaly, extreme prematurity)
- Persistent reversed end-diastolic flow in the umbilical artery

WHY IS THIS PERIOD SO IMPORTANT?



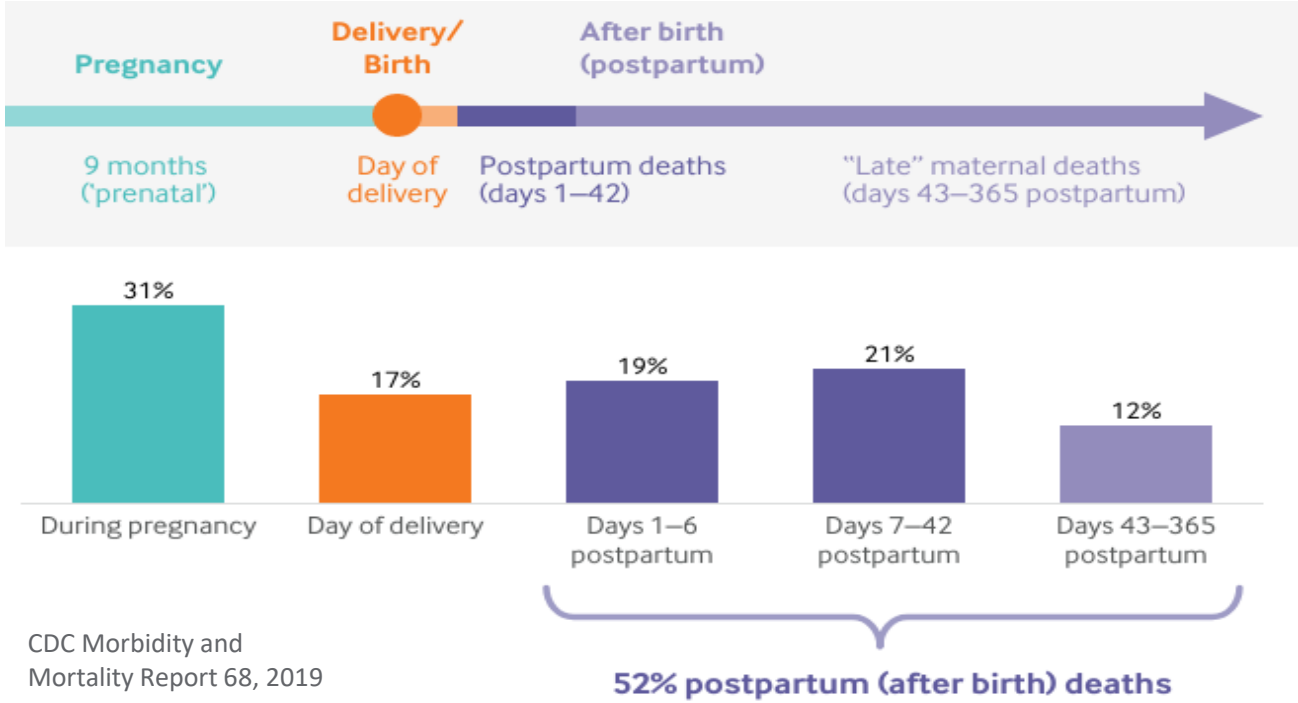
Pregnancy-related deaths by time of death relative to the end of pregnancy – Pregnancy Mortality Surveillance System, U.S., 2011–2015

WHY IS DOCUMENTATION OF CURRENT OR RECENT PREGNANCY SO IMPORTANT?



Nelson et al, Diseases and conditions that impact maternal health, 2021.

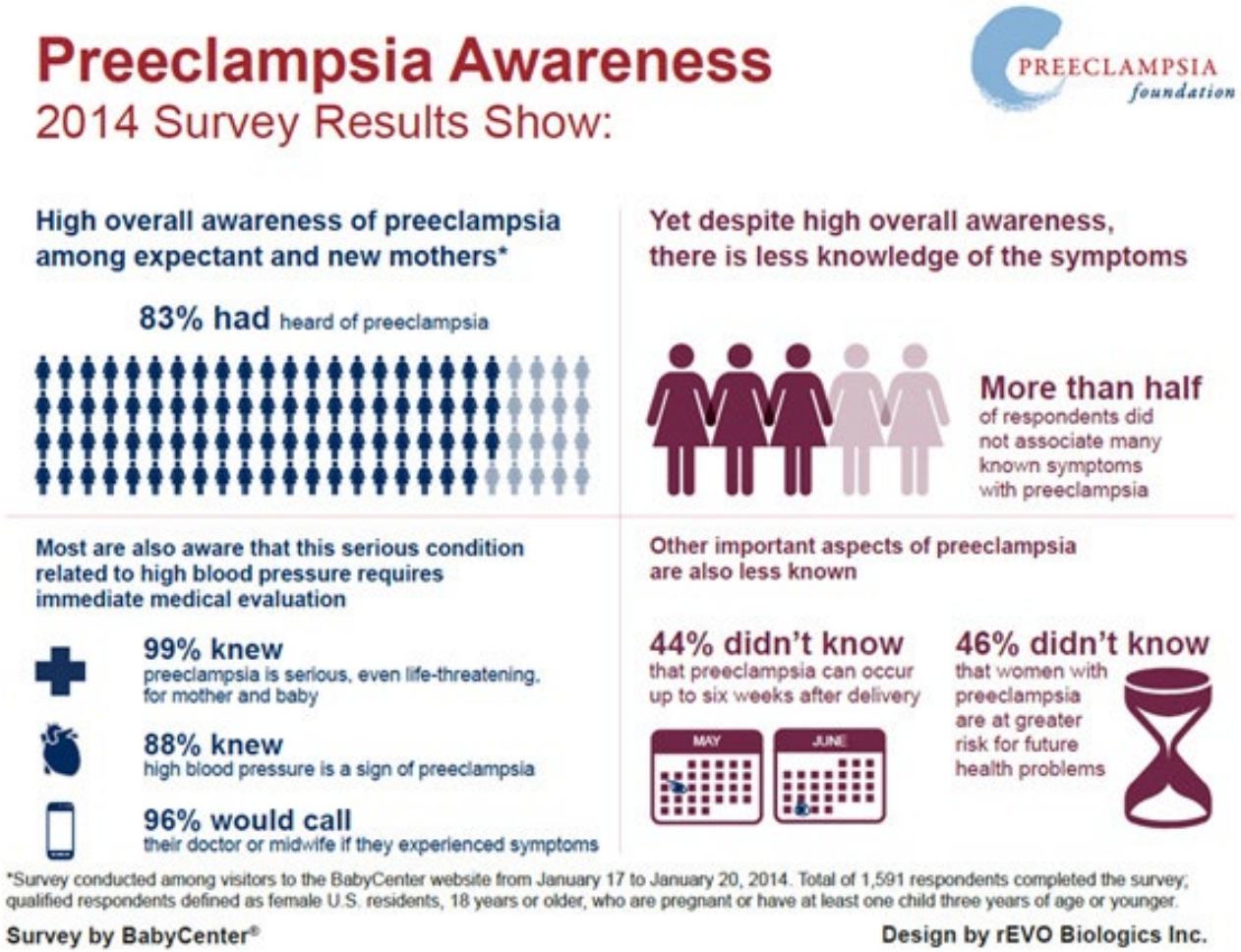
1. Pregnancy involves many physiologic changes that may not be fully recognized or appreciated by non-OB providers
2. Interpretation of signs and symptoms requires recognition and knowledge of pregnancy/postpartum pathophysiology
3. Pregnant and recently pregnant women are at risk for morbidity and mortality, with half of deaths in the PP period



CDC Morbidity and Mortality Report 68, 2019

WHY ARE CLOSE FOLLOW-UP AFTER DELIVERY AND POSTPARTUM PREECLAMPSIA EDUCATION SO CRITICAL?

- BP decreases in 1st 48 hours after delivery, then increases 3-6 days postpartum
  - Most patients have been discharged by this time
- 55% of women diagnosed with postpartum preeclampsia had not been previously diagnosed



TOP PREECLAMPSIA MYTHS

FACT: Severe range blood pressures should be treated with antihypertensives. An epidural may address pain, but assuming that severe range blood pressures are caused by pain is an example of normalcy bias.

Myth: Preeclampsia is "cured" by delivery.

FACT: Preeclampsia often resolves postpartum, but it can take a number of weeks for it to completely resolve. Some women develop preeclampsia for the first time postpartum. A substantial number of deaths related to preeclampsia occur in the first 5 days postpartum. Inaccurately telling women that preeclampsia is cured with delivery has led to delays in recognition and may be a contributor to postpartum mortality and morbidity.

Myth: Magnesium is a treatment for severe range blood pressures in preeclampsia.

FACT: Magnesium is used for prophylaxis eclampsia. It is NOT an antihypertensive agent. Women with severe range blood pressures and preeclampsia should receive BOTH an antihypertensive agent and magnesium.

Myth: First line treatment in eclampsia is a benzodiazepine.

FACT: Magnesium should be the first line treatment of eclampsia and has been shown to reduce recurrence of repeat seziures compared to other agents.

Myth: The main source of morbidity/mortality from preeclampsia is seizure.

FACT: The main source of morbidity and mortality is related to stroke. Numerous studies have found that women who die and had preeclampsia often have delayed treatment of hypertension. This emphasizes the importance of timely treatment with an antihypertensive agent for all women with preeclampsia/gestational hypertension/severe hypertension.

MANAGEMENT

EXAMPLE OF PREECLAMPSIA EDUCATION

Preeclampsia Foundation Educational Brochures

INSTRUCTIONS FOR USE

Tips: it's best to measure your blood pressure in the morning and experts recommend measurement at the same time every day

Step 1,Put the display screen on the inner sides of your wrist, and wrap the wrist-band well

Step 2, Check the wrist-band, ensure that the wrist-band is not too tight or too loose

Step 3,The device should be 10-15mm distence from your palm (about 1 finger width)

Step 4, Make sure keep the device at the level of your heart when you start to measure

TOOLS AND EXAMPLES

CMQCC

Guidelines for Management of HDP

5 Key Elements

1. Recognize symptoms and diagnose HDP
2. Blood pressure control
3. Seizure prevention
4. Delivery
   - 34 weeks – preeclampsia with severe features
   - 37 weeks – preeclampsia without severe features *or* gestational hypertension
5. Postpartum surveillance

Download:

Improving Health Care Response to Hypertensive Disorders of Pregnancy Toolkit (2021)

Slide Set for Professional Education

Informational Webinar Recording and Webinar Slide Set

EMERGENCY DEPARTMENT

Postpartum Preeclampsia Checklist

IF PATIENT < 6 WEEKS POSTPARTUM WITH:

- BP ≥ 160/110 or
- BP ≥ 140/90 with unremitting headache, visual disturbances, epigastric pain

- ☐ Call for Assistance
- ☐ Designate:
  - ○ Team leader
  - ○ Checklist reader/recorder
  - ○ Primary RN
- ☐ Ensure side rails up
- ☐ Call obstetric consult; Document call
- ☐ Place IV; Draw preeclampsia labs
  - ○ CBC
  - ○ PT
  - ○ PTT
  - ○ Fibrinogen
  - ○ Chemistry Panel
  - ○ Uric Acid
  - ○ Hepatic Function
  - ○ Type and Screen
- ☐ Ensure medications appropriate given patient history
- ☐ Administer seizure prophylaxis
- ☐ Administer antihypertensive therapy
  - ○ Contact *MFM* or Critical Care for refractory blood pressure
- ☐ Consider indwelling urinary catheter
  - ○ Maintain strict I&O — patient at risk for pulmonary edema
- ☐ Brain imaging if unremitting headache or neurological symptoms

† "Active asthma" is defined as:
Ⓐ symptoms at least once a week, or
Ⓑ use of an inhaler, corticosteroids for asthma during the pregnancy, or
Ⓒ any history of intubation or hospitalization for asthma.

Magnesium Sulfate

Contraindications: *Myasthenia gravis; avoid with pulmonary edema, use caution with renal failure*

IV access:

- ☐ Load 4-6 grams 10% magnesium sulfate in 100 mL solution over 20 min
- ☐ Label magnesium sulfate; Connect to labeled infusion pump
- ☐ Magnesium sulfate maintenance 1-2 grams/hour

No IV access:

- ☐ 10 grams of 50% solution IM (5 g in each buttock)

Antihypertensive Medications

For SBP ≥ 160 or DBP ≥ 110
(See SMI algorithms for complete management when necessary to move to another agent after 2 doses.)

- ☐ **Labetalol** (initial dose: 20mg); **Avoid parenteral labetalol with active asthma, heart disease, or congestive heart failure; use with caution with history of asthma**
- ☐ **Hydralazine** (5-10 mg IV* over 2 min); **May increase risk of maternal hypotension**
- ☐ **Oral Nifedipine** (10 mg capsules); Capsules should be administered orally, not punctured or otherwise administered sublingually

** Maximum cumulative IV-administered doses should not exceed 220 mg labetalol or 25 mg hydralazine in 24 hours*

***Note:** if first line agents unsuccessful, emergency consult with specialist (MFM, internal medicine, OB anesthesiology, critical care) is recommended*

Anticonvulsant Medications

For recurrent seizures or when magnesium sulfate contraindicated

- ☐ **Lorazepam (Ativan):** 2-4 mg IV x 1, may repeat once after 10-15 min
- ☐ **Diazepam (Valium):** 5-10 mg IV q 5-10 min

GOALS WITH TREATMENT

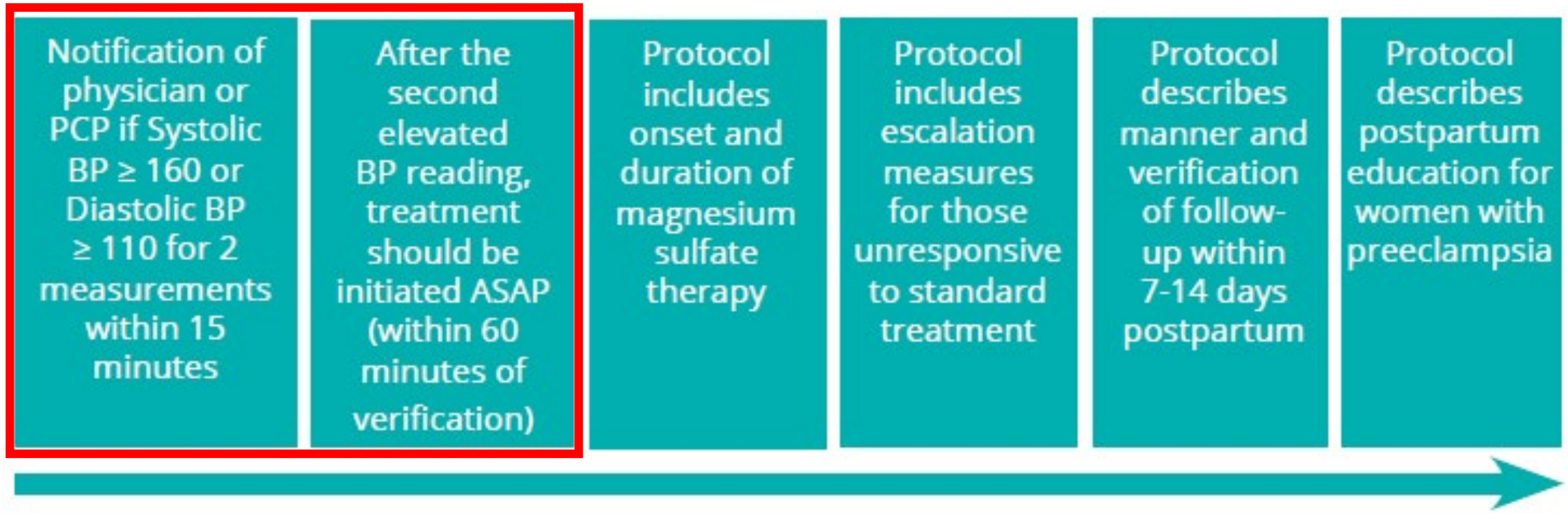
- BP >160/110 in pre-eclampsia results in loss of auto-regulation and an increase in maternal stroke/hemorrhage
  - Therefore goal is treatment with out delay, ideally <60 min from onset of severe range BP
- All forms of preeclampsia have a risk of eclampsia, with neurologic signs indicating a higher risk
  - Initiation of magnesium sulfate: 6g bolus and 2g/hr infusion
- Transition to OB unit or with OB involvement for admission/monitoring

WHAT ARE YOUR OB UNITS REQUIRED TO HAVE FOR PREECLAMPSIA?

STANDARD PROTOCOLS WITH CHECKLISTS AND ESCALATION POLICIES

- Facility-wide standard protocols (including checklists, escalation protocols, treatment algorithms, etc.) addressing management of:
  1. Preeclampsia, including use of magnesium for seizure prophylaxis
  2. Magnesium overdose
  3. Severe hypertension
  4. Eclampsia
  5. Postpartum preeclampsia/severe hypertension

MINIMUM REQUIREMENTS FOR PROTOCOLS



WHY IS PROMPT NOTIFICATION AND TREATMENT OF SEVERE HTN SO CRITICAL?

Untreated hypertension leads to preventable maternal death

1. Stroke is the major cause of maternal mortality associated with preeclampsia or eclampsia
2. Antihypertensive treatment was not implemented in the majority of stroke cases
3. Opportunities for care improvement around severe hypertension treatment may significant affect maternal morbidity and mortality

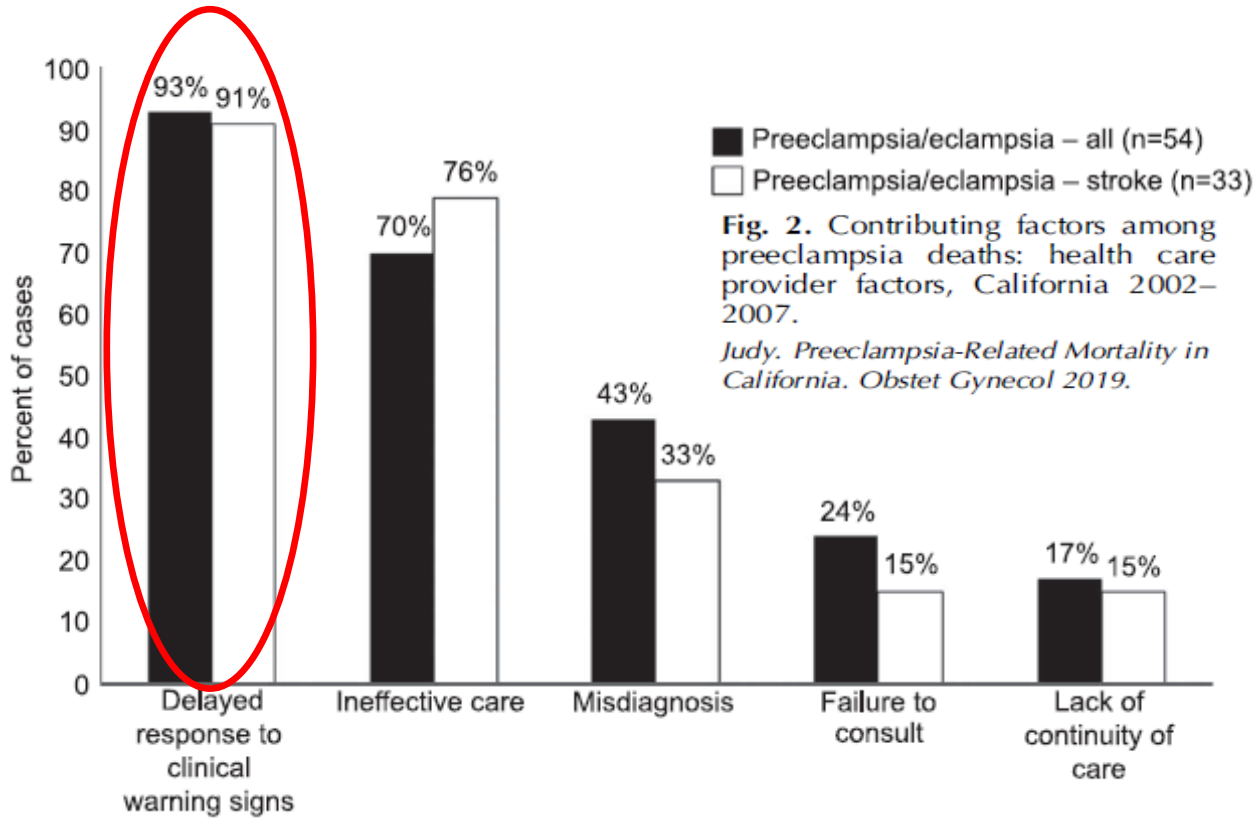


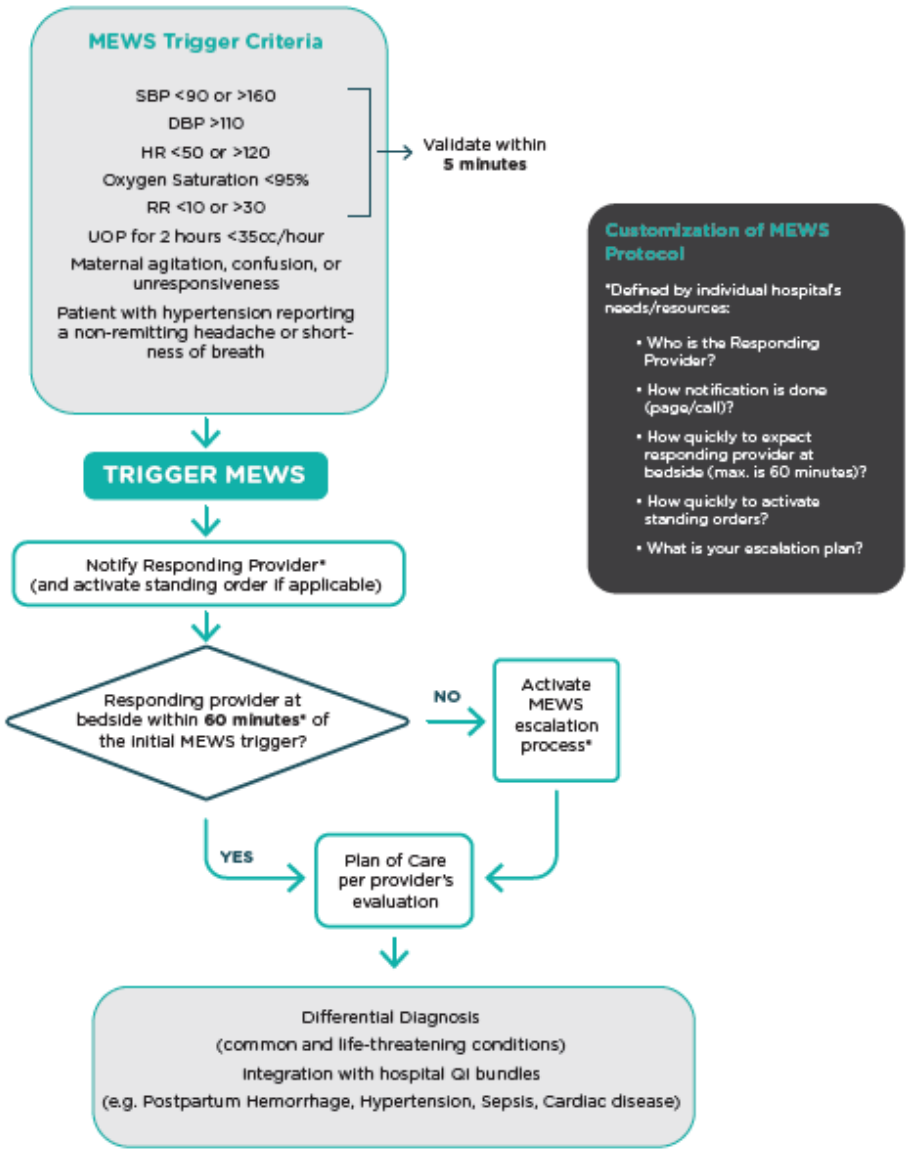
Fig. 2. Contributing factors among preeclampsia deaths: health care provider factors, California 2002–2007.

Judy. Preeclampsia-Related Mortality in California. Obstet Gynecol 2019.

Judy et al. Systolic hypertension, preeclampsia-related mortality and stroke in California. Obstet Gynecol 2019

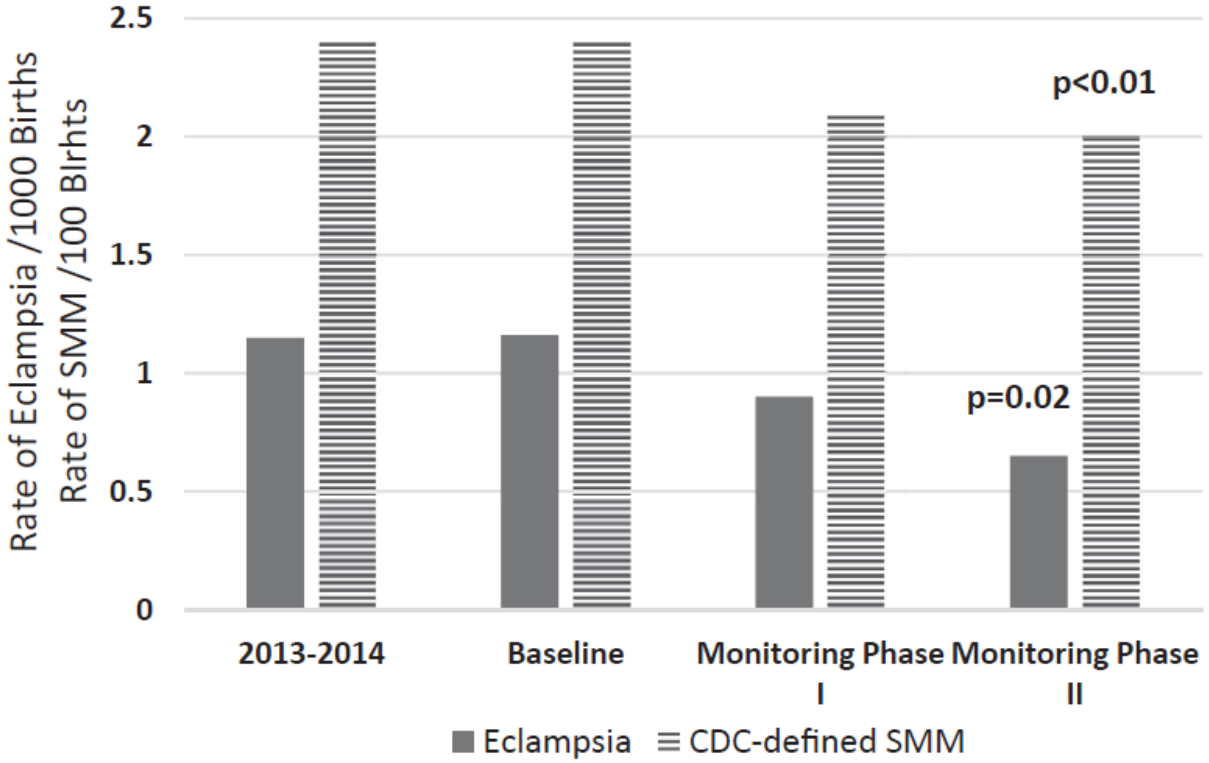
EXAMPLES AND TOOLS: MEWS

- https://www.tchmb.org/mews
  - Videos
  - Webinars
  - Toolkits



FURTHER JUSTIFICATION

FIGURE
Rate of eclampsia and severe maternal morbidity



Rate of eclampsia per 1000 births and rate of Centers for Disease Control and Prevention (CDC)-defined severe maternal morbidity (SMM) per 100 births.

Shields et al. Standardized treatment of critical blood pressure. Am J Obstet Gynecol 2017.

Implementation of early protocol-driven severe hypertension/preeclampsia treatment results in:

1. Lower rates of eclampsia
2. Significant reduction in severe maternal morbidity

TOOL: HYPERTENSIVE EMERGENCY CHECKLIST

Hypertensive Emergency Checklist

Hypertensive Emergency:

- Two severe BP values (≥160/110) taken 15-60 minutes apart. Values do not need to be consecutive.
- May treat within 15 minutes if clnically indicated

- ☐ Call for Assistance
- ☐ Designate:
  - ○ Team leader
  - ○ Checklist reader/recorder
  - ○ Primary RN
- ☐ Ensure side rails up
- ☐ Ensure medications appropriate given patient history
- ☐ Administer seizure prophylaxis (magnesium sulfate first line agent, unless contraindicated)
- ☐ Antihypertensive therapy within 1 hour for persistent severe range BP
- ☐ Place IV; Draw preeclampsia labs
- ☐ Antenatal corticosteroids (if <34 weeks of gestation)
- ☐ Re-address VTE prophylaxis requirement
- ☐ Place indwelling urinary catheter
- ☐ Brain imaging if unremitting headache or neurological symptoms
- ☐ Debrief patient, family, and obstetric team

Magnesium Sulfate

Contraindications: Myasthenia gravis; avoid with pulmonary edema, use caution with renal failure

IV access:

- ☐ Load 4-6 grams 10% magnesium sulfate in 100 mL solution over 20 min
- ☐ Label magnesium sulfate; Connect to labeled infusion pump
- ☐ Magnesium sulfate maintenance 1-2 grams/hour

No IV access:

- ☐ 10 grams of 50% solution IM (5 g in each buttock)

Antihypertensive Medications

For SBP ≥ 160 or DBP ≥ 110
(See SMI algorithms for complete management when necessary to move to another agent after 2 doses.)

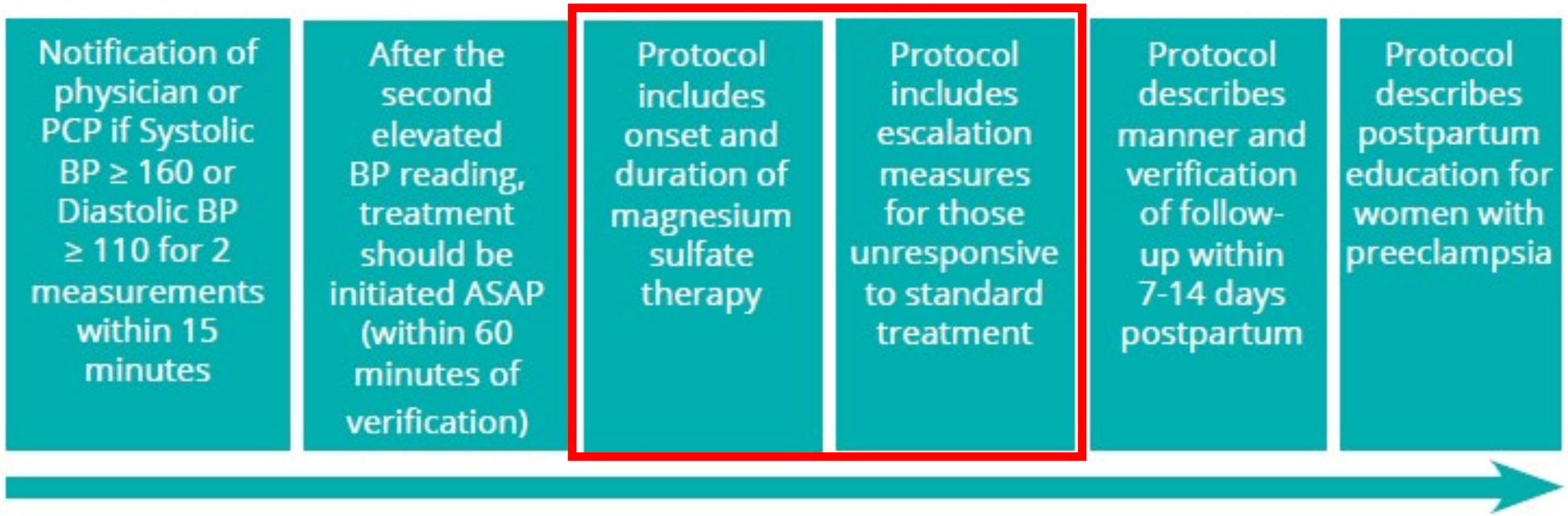
- ☐ **Labetalol** (initial dose: 20mg); **Avoid parenteral labetalol with active asthma, heart disease, or congestive heart failure; use with caution with history of asthma**
- ☐ **Hydralazine** (5-10 mg IV* over 2 min); **May increase risk of maternal hypotension**
- ☐ **Oral Nifedipine** (10 mg capsules); Capsules should be administered orally, not punctured or otherwise administered sublingually

** Maximum cumulative IV-administered doses should not exceed 220 mg labetalol or 25 mg hydralazine in 24 hours*

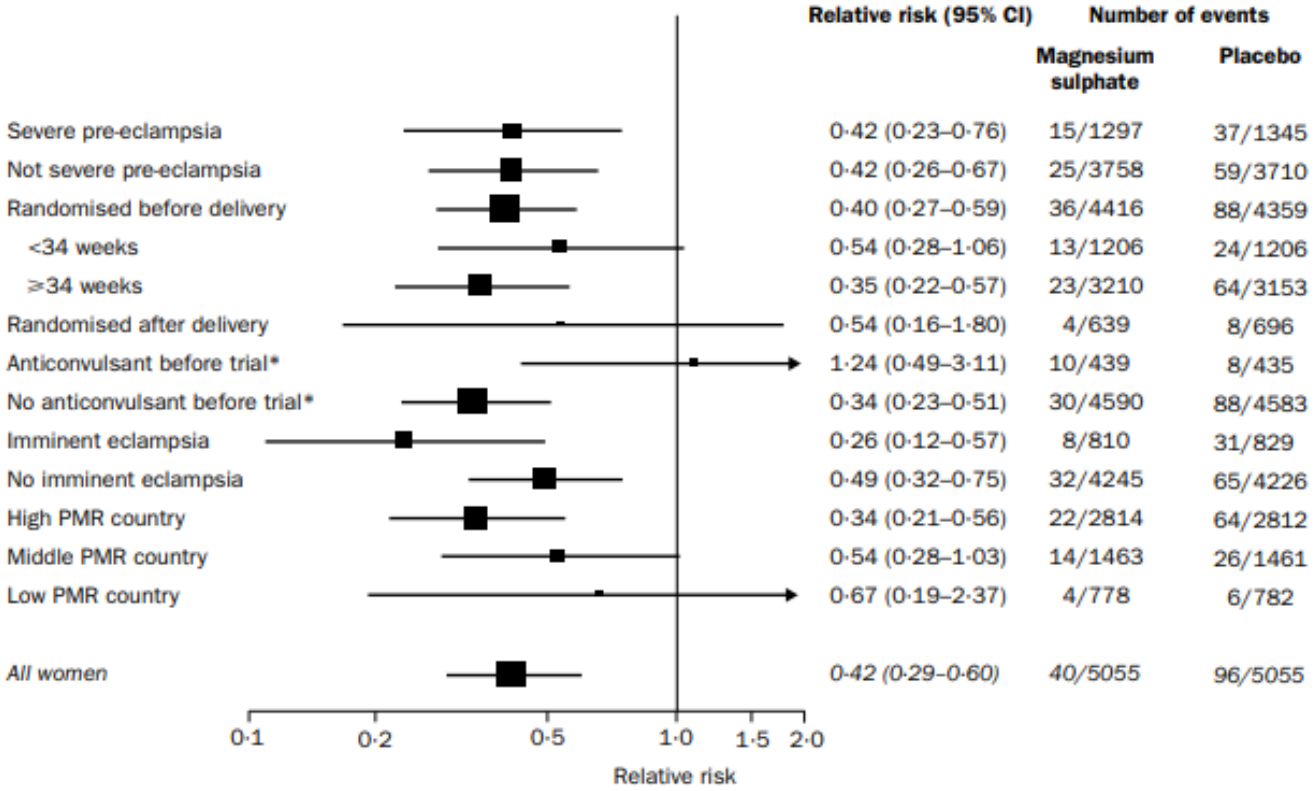
***Note:** If first line agents unsuccessful, emergency consult with specialist (MFM, internal medicine, OB anesthesiology, critical care) is recommended*

ACOG District II, 2019. Hypertensive emergency checklist

MINIMUM REQUIREMENTS FOR PROTOCOLS



WHY IS APPROPRIATE AND CONSISTENT USE OF MAG SULFATE SO IMPORTANT?

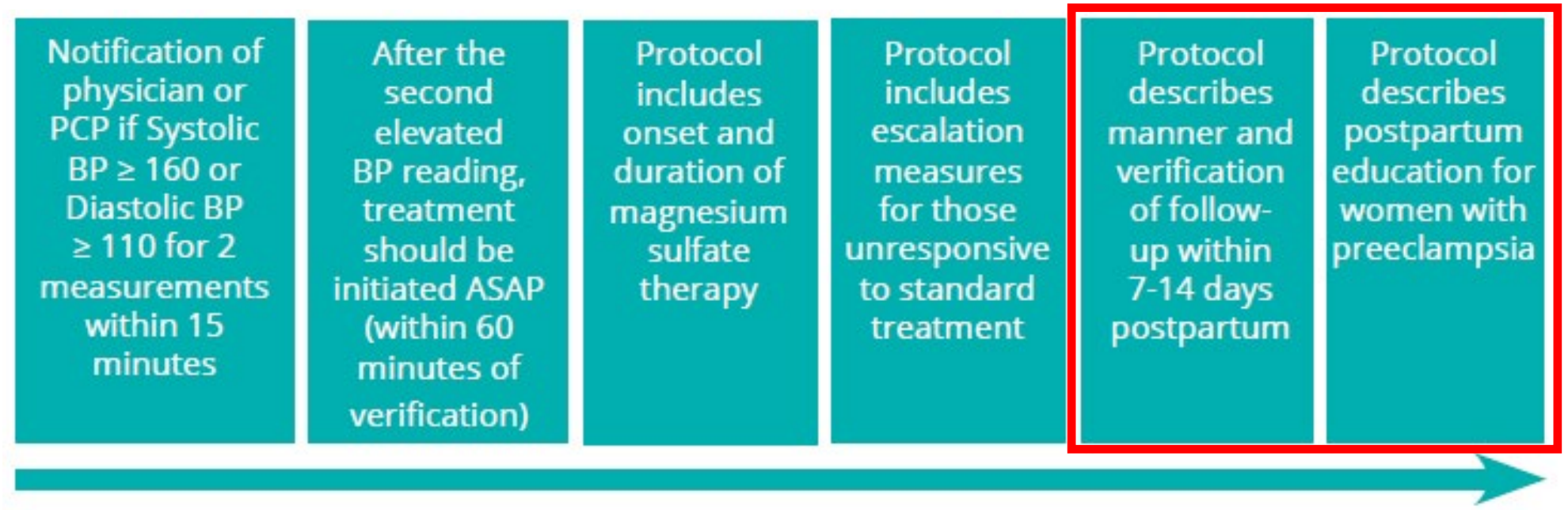


Duley et al. Do women with pre-eclampsia, and their babies, benefit from magnesium sulphate? The Magpie Trial: a randomised placebo controlled trial. The Lancet 2002

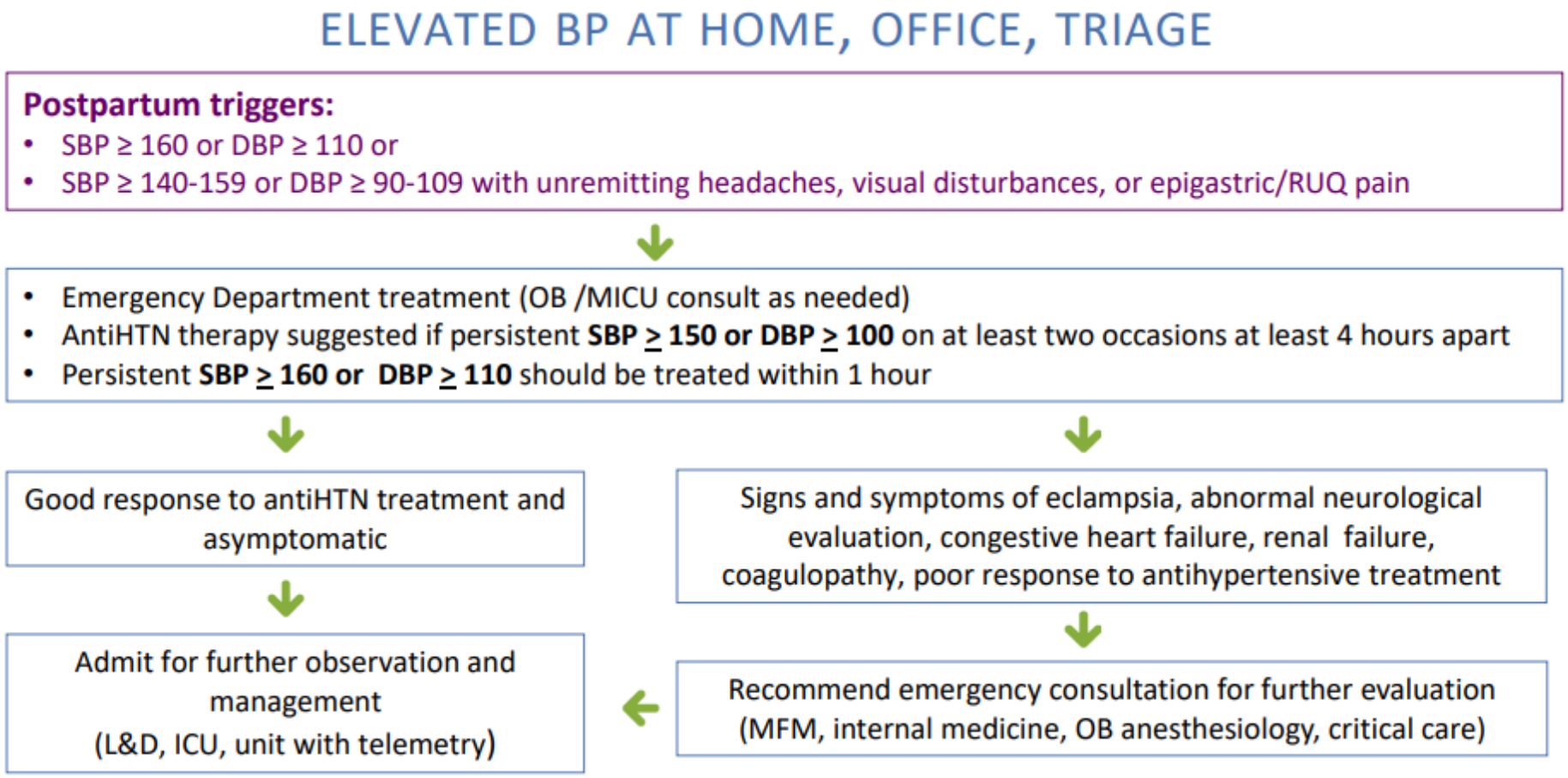
Magnesium sulfate therapy in women with severe preeclampsia:

1. Lowers the risk of eclampsia by >50%
2. Likely decreases maternal mortality

MINIMUM REQUIREMENTS FOR PROTOCOLS



EXAMPLE OF POSTPARTUM HTN READMISSION ALGORITHM



TOOL: POSTPARTUM PREECLAMPSIA CHECKLIST

EMERGENCY DEPARTMENT

Postpartum Preeclampsia Checklist

IF PATIENT < 6 WEEKS POSTPARTUM WITH:

- BP ≥ 160/110 or
- BP ≥ 140/90 with unremitting headache, visual disturbances, epigastric pain

- ☐ Call for Assistance
- ☐ Designate:
  - ○ Team leader
  - ○ Checklist reader/recorder
  - ○ Primary RN
- ☐ Ensure side rails up
- ☐ Call obstetric consult; Document call
- ☐ Place IV; Draw preeclampsia labs
  - ○ CBC
  - ○ PT
  - ○ PTT
  - ○ Fibrinogen
  - ○ Chemistry Panel
  - ○ Uric Acid
  - ○ Hepatic Function
  - ○ Type and Screen
- ☐ Ensure medications appropriate given patient history
- ☐ Administer seizure prophylaxis
- ☐ Administer antihypertensive therapy
  - ○ Contact MFM or Critical Care for refractory blood pressure
- ☐ Consider indwelling urinary catheter
  - ○ Maintain strict I&O — patient at risk for pulmonary edema
- ☐ Brain imaging if unremitting headache or

Magnesium Sulfate

Contraindications: Myasthenia gravis; avoid with pulmonary edema, use caution with renal failure

IV access:

- ☐ Load 4-6 grams 10% magnesium sulfate in 100 mL solution over 20 min
- ☐ Label magnesium sulfate; Connect to labeled infusion pump
- ☐ Magnesium sulfate maintenance 1-2 grams/hour

No IV access:

- ☐ 10 grams of 50% solution IM (5 g in each buttock)

Antihypertensive Medications

For SBP ≥ 160 or DBP ≥ 110
(See SMI algorithms for complete management when necessary to move to another agent after 2 doses.)

- ☐ **Labetalol** (initial dose: 20mg); **Avoid parenteral labetalol with active asthma, heart disease, or congestive heart failure; use with caution with history of asthma**
- ☐ **Hydralazine** (5-10 mg IV* over 2 min); **May increase risk of maternal hypotension**
- ☐ **Oral Nifedipine** (10 mg capsules); Capsules should be administered orally, not punctured or otherwise administered sublingually

** Maximum cumulative IV-administered doses should not exceed 220 mg labetalol or 25 mg hydralazine in 24 hours*

ACOG District II, 2019. Postpartum preeclampsia checklist

TRANSFERS AND FOLLOW UP

TRAINING AND TRANSFERS

- **Texas Maternal Designation Rules (Level III/Level IV):**

  "Provide outreach education related to trends identified through the QAPI Plan, specific requests, and system needs to lower level designated facilities, and as appropriate and applicable, to non-designated facilities, birthing centers, independent midwife practices, and prehospital providers"

  Texas Administrative Code: Effective January 8, 2023

MAP OF TEXAS WITH MATERNAL CARE CENTERS AND TRANSFER CENTER NUMBERS

Insert Web Page

This app allows you to insert secure web pages starting with https:// into the slide deck. Non-secure web pages are not supported for security reasons.

Please enter the URL below.

https:// public.flourish.studio/visualisation/15961566/

Note: Many popular websites allow secure access. Please click on the preview button to ensure the web page is accessible.

TRANSFER RESPONSIBILITIES

While awaiting transfer -

All levels of care need to have the capability to stabilize and provide care to obstetric emergencies, including hypertensive disorders

During transfer –

The referring physician and hospital are responsible for the patient during transport unless being transported by the receiving hospitals maternal transport team.

POSTPARTUM PREECLAMPSIA IN THE EMERGENCY DEPARTMENT

GOALS FOR CURRENT CARE

Identifying postpartum patients	**Timely Treatment –** Antihypertensive for Severe Range BP within 1 hour	**OB Consult** and Joint Case Reviews between OB and ED

Postpartum Preeclampsia Care in the ED

ED care can prevent some postpartum deaths based on Texas Maternal Mortality and Morbidity Review Committee Findings

1. **Ask women ages 15-45 years if they have been pregnant in the past 6 weeks**
2. **If yes, add postpartum complications to your differential**
3. **Check for early postpartum warning signs and their medical problem list**
4. **If qualifies, initiate postpartum preeclampsia checklist**
5. **Seek OB consult early**
6. **Refer patient to higher level of care if needed. If being discharged, arrange follow up and educate when to return**

Source: Florida PQC

Q&A