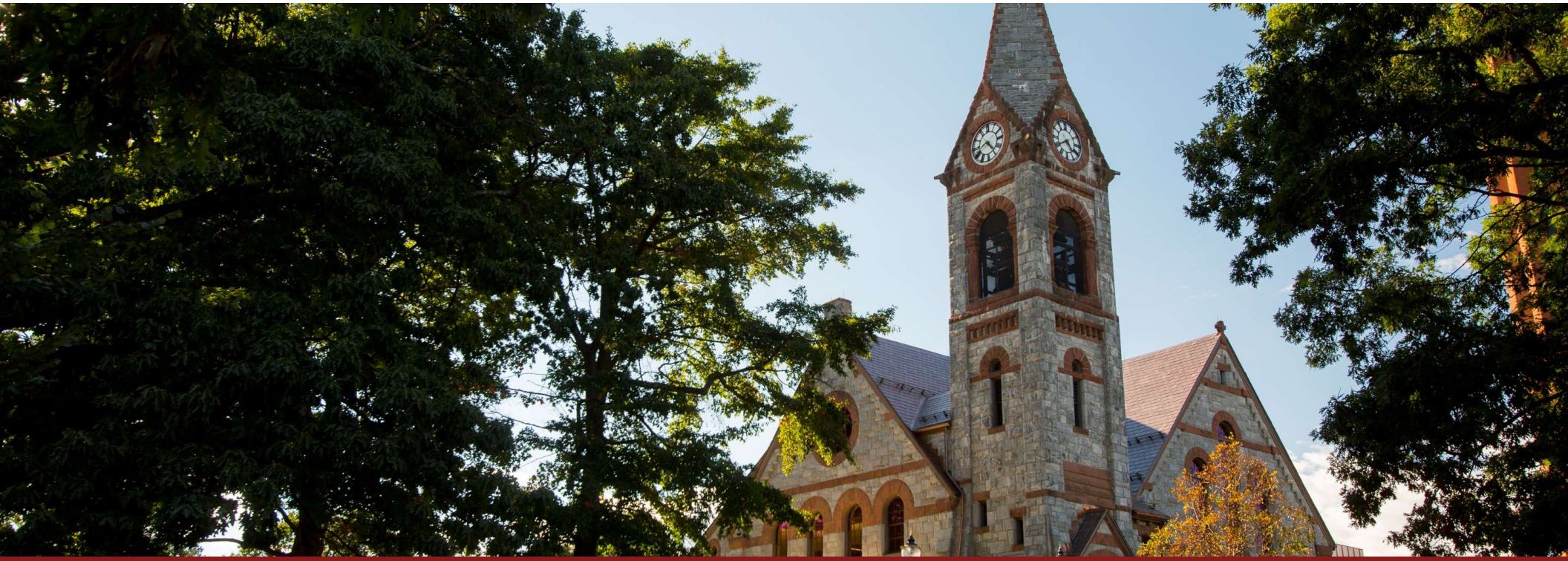


# Hypertensive Disorders of Pregnancy / Postpartum & Role of the PHN

# Presenters

- Chassea Robinson, RN – PHN Consultant, Northeast Region, UMass Amherst Elaine Marieb College of Nursing
- Jeanne Butler, RN – PHN, North Shore Public Health Collaborative & North Shore Mother Visiting Partnership

# Conflict of Interest

- **The presenters have acknowledged that there are no financial disclosures and no conflicts of interests.**

# Objectives

Describe Hypertensive Disorders of Pregnancy and Postpartum

Review warning indicators

Explore the role of the local PHN

Case Presentation

# Introduction

- The incidence of **HYPERTENSIVE DISORDERS of PREGNANCY (HDP)** more than doubled between 1993 and 2017 in the US.

- From 2017 to 2019, 16% of US births were complicated by HDP, and 32% of maternal deaths during delivery hospitalizations included an HDP diagnosis.

Hypertensive Disorders in Pregnancy and Mortality at Delivery Hospitalization — United States, 2017–2019 | MMWR

## Dr. Green Smith (Nurse Midwife, Doctor of Nursing Practice, Adjunct Professor, Women's Health Advocate)


- **American College of Nurse-Midwives statement**:
- "That a Black midwife and maternal health expert died after giving birth in the United States is both heartbreaking and unacceptable. Her death underscores the persistent and well-documented reality that Black women — regardless of education, income, or professional expertise — face disproportionate risks during pregnancy and childbirth due to systemic racism and failures in care."

# Maternal Morbidity and Mortality defined

## Morbidity

- Severe maternal morbidity (SMM) is defined as **unexpected outcomes** during the delivery hospitalization that result in significant short- and long-term consequences to a person's health.

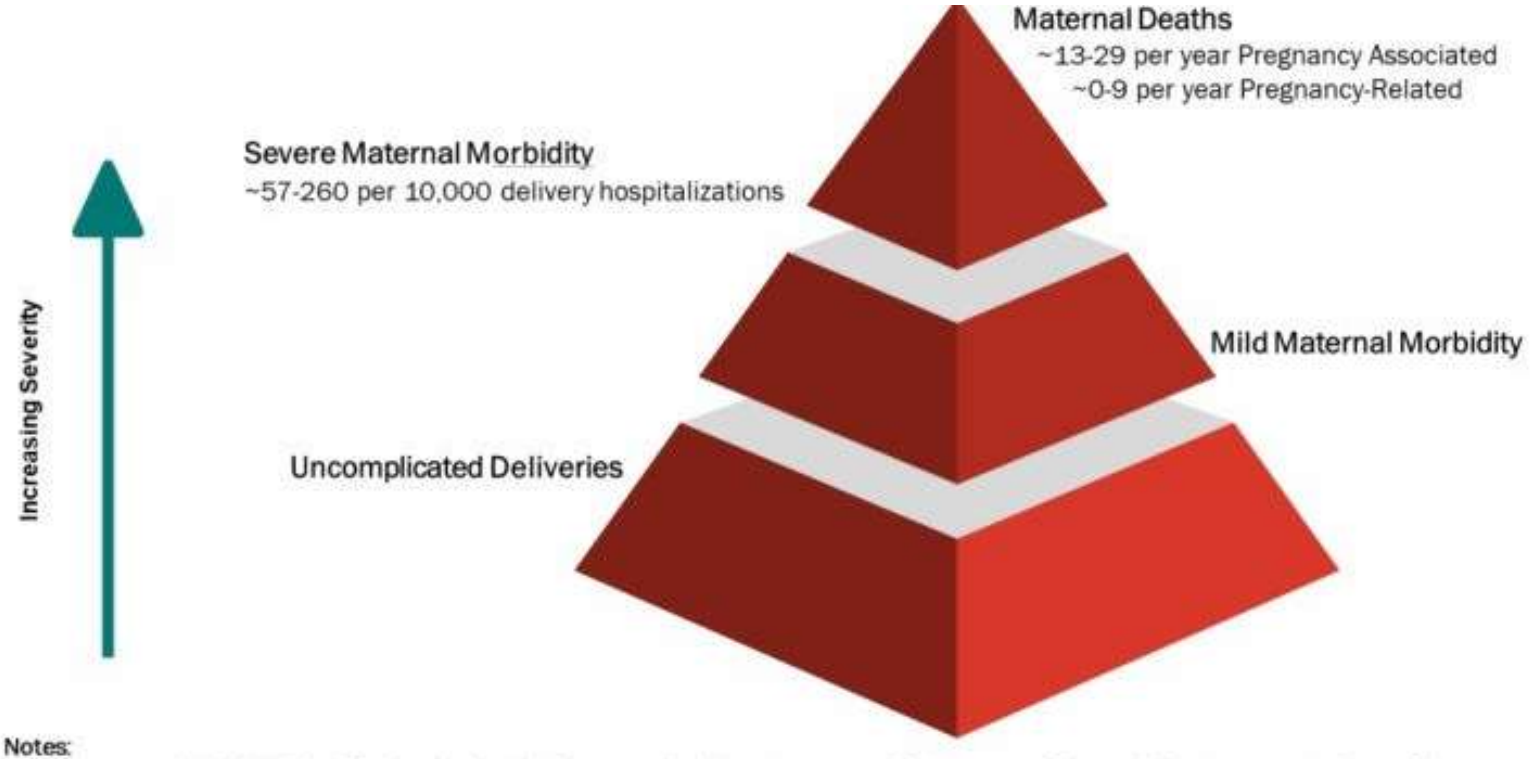
- (Shock, sepsis, heart failure, eclampsia, disseminated intravascular coagulation, acute respiratory distress syndrome, aneurysm)

- AKA near misses

## Mortality

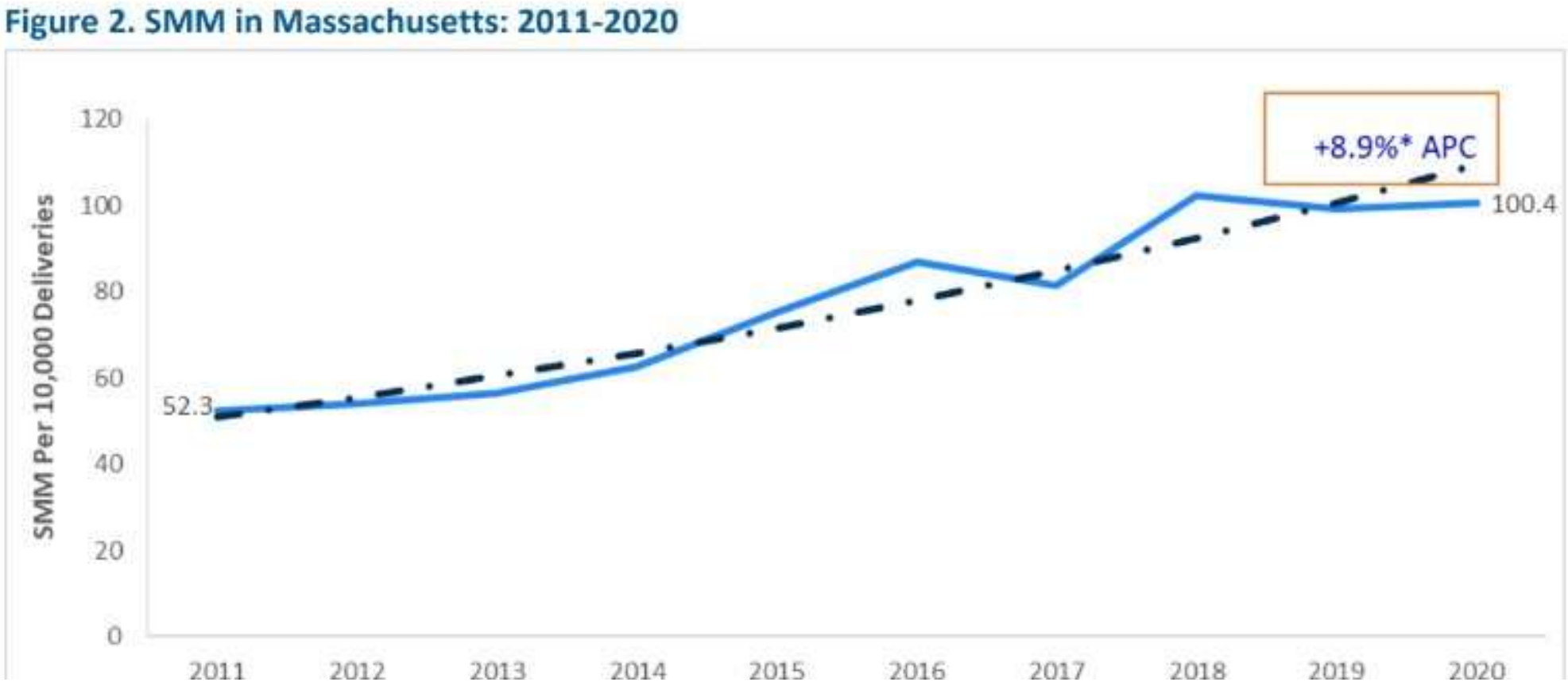
- Maternal mortality refers to the **death** of a woman from complications of pregnancy or childbirth that occur during the pregnancy or within 6 weeks after the pregnancy ends.

# Severe Morbidity and Mortality in Massachusetts




Notes:
Pregnancy-associated death is defined as the death of a person during pregnancy or within one year of the end of pregnancy regardless of the cause.
Pregnancy-related death (maternal death) is the death of a person during pregnancy or within one year of the end of pregnancy from a pregnancy complication, a chain of events initiated by pregnancy or the aggravation of an unrelated condition by the physiologic effects of pregnancy

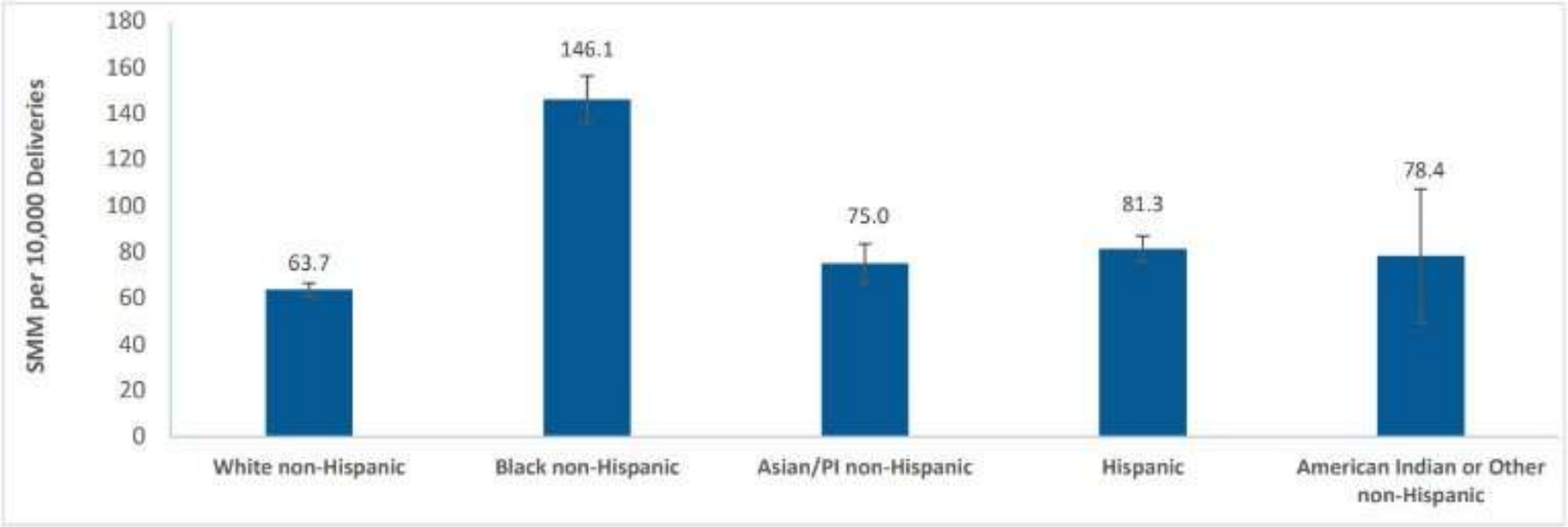
# Severe Maternal Morbidity Massachusetts




LPHNC Program, Elaine Marieb College of Nursing, University of Massachusetts, Amherst.

# Massachusetts SMM by Race and Ethnicity

**Figure 3. SMM in Massachusetts by Race and Hispanic Ethnicity: 2011-2020**



# Hypertensive Disorders Defined

**2013**

- American Congress of Obstetricians and Gynecologists (ACOG), guidelines include:
  - gestational hypertension
  - preeclampsia/eclampsia
  - chronic hypertension
  - chronic hypertension with superimposed preeclampsia/eclampsia

**2020**

- International Society of Hypertension, guidelines took list and added:
  - hemolysis, elevated liver enzymes, and low platelets (HELLP) syndrome as a unique entity

# Blood Pressure Categories for Individuals who are Pregnant

American Heart Association.

| BLOOD PRESSURE CATEGORY | SYSTOLIC mm Hg (top/upper number) | | DIASTOLIC mm Hg (bottom/lower number) |
|---|---|---|---|
| NON-HYPERTENSIVE | LESS THAN 140 | and | LESS THAN 90 |
| HYPERTENSION IN PREGNANCY* | 140 OR HIGHER | or | 90 OR HIGHER |
| SEVERE HYPERTENSION* (If you don't have symptoms, call your health care professional immediately) | 160 OR HIGHER | or | 110 OR HIGHER |

*If you have any of these symptoms, call 911: severe headache, change in vision, abdominal pain, chest pain, significant swelling, or shortness of breath

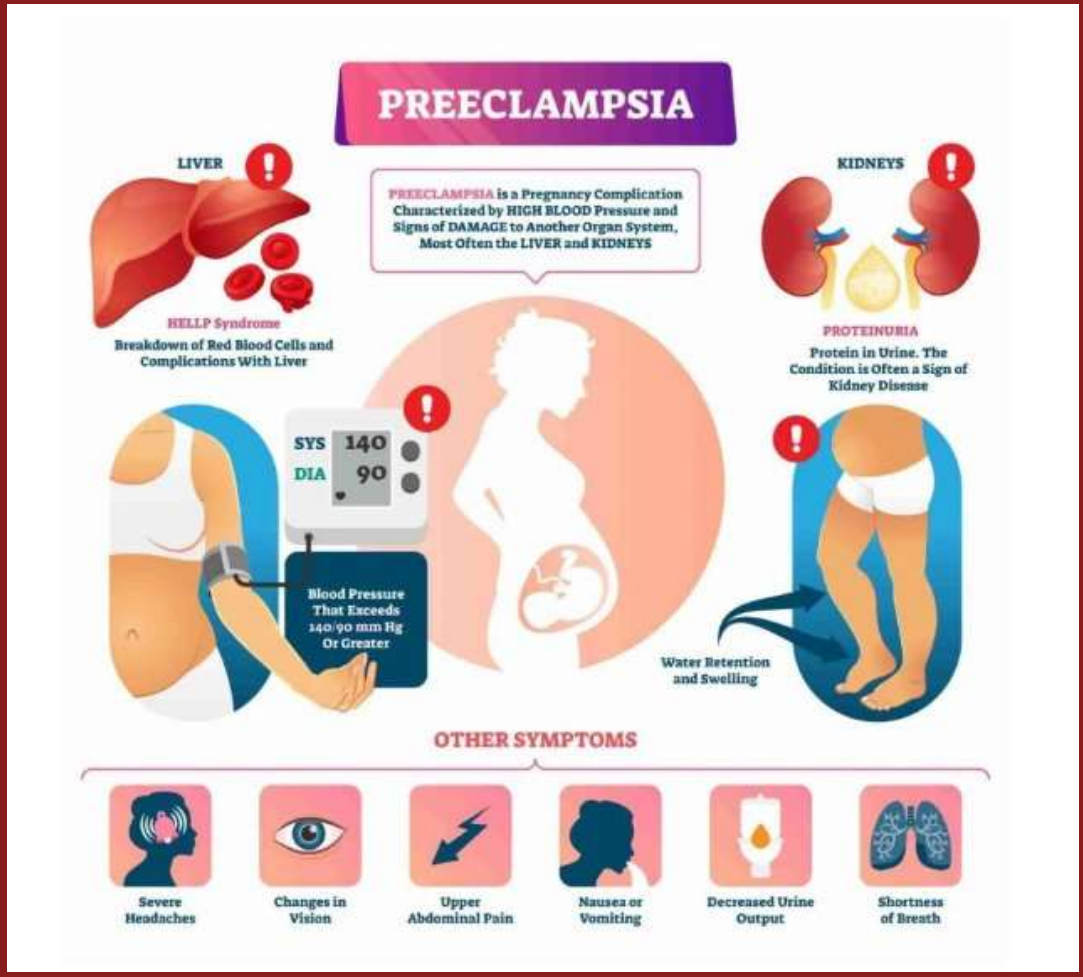
| Pregnancy Pre-Eclampsia | Eclampsia | HELLP Syndrome | Postpartum Pre-Eclampsia | Postpartum Eclampsia |
|---|---|---|---|---|
| **After 20 wks pregnancy** | Third term of pregnancy | Late stages of pregnancy – shortly after birth | 48 hrs after birth – 6 weeks | 48 – 72 hrs after birth |
| • BP > 140/90<br><br>**+ one or more:**<br>• Protein in urine<br>• Swelling in legs, hand, face, body<br>• Severe: BP> 160/110<br>• Visual changes<br>• Upper abd pain | | | | |

| Pregnancy Pre-Eclampsia | Eclampsia | HELLP Syndrome | Postpartum Pre-Eclampsia | Postpartum Eclampsia |
|---|---|---|---|---|
| After<br>20 wks pregnancy | **Third term of pregnancy** | Late stages of pregnancy – shortly after birth | 48 hrs after birth – 6 weeks | 48 – 72 hrs after birth |
| | • Add'l signs:<br><br>• Severe HA<br>• Seizure<br>• Coma<br>• Altered mental status<br>• Stroke<br>• Seizure | | | |

| Pregnancy Pre-Eclampsia | Eclampsia | HELLP Syndrome | Postpartum Pre-Eclampsia | Postpartum Eclampsia |
|---|---|---|---|---|
| After<br>20 wks pregnancy | Third term of pregnancy | **H**emolysis,**E**levated **L**iver enzymes, **L**ow **P**latelets | 48 hrs after birth – 6 weeks | 48 – 72 hrs after birth |
| | | • Considered to be a Variant of Pre-Eclampsia<br>• Damage to Liver and Blood Cells<br>• Chest pain,<br>• **Abd pain/RUQ,N/V**<br>• Bleeding in the liver<br>• Wt gain & Edema (precede in 50% cases)<br>• Jaundice<br>• *Often occurs with HTN and proteinuria BUT in 10-20% these signs are absent* | | |

| Pregnancy Pre-Eclampsia | Eclampsia | HELLP Syndrome | Postpartum Pre-Eclampsia | Postpartum Eclampsia |
|---|---|---|---|---|
| After<br>20 wks pregnancy | Third term of pregnancy | Late stages of pregnancy – shortly after birth | **48 hrs after birth – 6 weeks** | 48 – 72 hrs after birth |
| | | | • BP > 140/90<br>• **HA**<br>• Visual Changes<br>• Upper Abd Pain<br>• Nausea/Vomit<br>• Shortness of Breath<br>• Swelling of hands, face | |

| Pregnancy Pre-Eclampsia | Eclampsia | HELLP Syndrome | Postpartum Pre-Eclampsia | Postpartum Eclampsia |
|---|---|---|---|---|
| After<br>20 wks pregnancy | Third term of pregnancy | Late stages of pregnancy – shortly after birth | 48 hrs after birth – 6 weeks | **48 – 72 hrs after birth** |
| | | | | • High BP 160/110<br>• Difficulty Breathing<br>• Chest pain<br>• Peripheral edema<br>• Seizure<br><br>• Left untreated; may result in coma, brain damage, death |


PREECLAMPSIA
LIVER
KIDNEYS
PREECLAMPSIA is a Pregnancy Complication Characterized by HIGH BLOOD Pressure and Signs of DAMAGE to Another Organ System, Most Often the LIVER and KIDNEYS
HELLP Syndrome
Breakdown of Red Blood Cells and Complications With Liver
PROTEINURIA
Protein in Urine. The Condition is Often a Sign of Kidney Disease
SYS 140
DIA 90
Blood Pressure That Exceeds 140/90 mm Hg Or Greater
Water Retention and Swelling
OTHER SYMPTOMS
Severe Headaches
Changes in Vision
Upper Abdominal Pain
Nausea or Vomiting
Decreased Urine Output
Shortness of Breath

# Eclampsia and HELLP Treatment

- **Blood pressure medications**, such as labetalol, hydralazine, or nifedipine, may be used if a woman has severe preeclampsia or very high blood pressure (160/110 mmHg or higher). The medication may be given intravenously or orally.
- **Anticonvulsant medications**, such as IV magnesium sulfate, may be used to reduce the risk of seizures (eclampsia).
- **Blood transfusions**, if a woman with HELLP syndrome loses too much blood as a result of a hemorrhage
- **Steroids,** to help increase platelet levels

# HDP Impact on Infant

- Low birth weight
- Preterm birth
- Neonatal respiratory distress syndrome
- Low platelet count, which may cause severe bleeding
- Increased risk of stillbirth
- Increased risk of Neonatal Care Unit (NICU) admission

# Case Presentation

# North Shore Public Health Collaborative & North Shore Mother Visiting Partnership (NSMVP)

PHNs perform **maternal home visits** through the North Shore Mother Visiting Partnership (NSMVP)

NSMVP **Team** consists of PHNs, Social Worker, Epidemiologists, Community Health Worker, Coordinator

**Referrals** via phone, text, and email are made by families, hospitals, case managers, & clinicians

# Case Presentation (pregnancy)

33 yo White female

History of hypotension and associated syncope

College educated

No risk factors

First pregnancy

# Case Presentation (symptoms)

At 28 wks, saw OBGYN for regular visit

Normal BP, but not feeling well

Chief complaint = Mid and RUQ abdominal pain

General malaise

Diagnosed and treated for indigestion (Prilosec)

# Case Presentation (warning signs)

Over next 3 weeks, worsening pain continued, with HA especially at night

Bilateral lower extremity edema

At 31 wks (3 weeks after symptom onset), blood test ordered

MD called with results and instructed patient to go immediately to the Salem Hospital ER

# Case Presentation (diagnosis)

## At ER, elevated BP

## Diagnosed with HELLP Syndrome

- Hemolysis
- Elevated liver enzymes
- Low platelet count

# Case Presentation (Intervention)

- Sent to MGH for emergency c-section
- Received platelets prior to c-section
- Infant born at 31 wks, weighed 3 lb 8oz
- Case sent home on HTN meds
- Monitored BP at home for 1 week
- Infant spent 1 week in NICU and 6 weeks in Special Care Unit

# Case Presentation (home visit)

- Case reports that BP symptoms resolved
- PHN visited approximately 1 month after infant discharged
- Infant healthy, thriving
- Case reports: "I wish I had trusted my gut sooner"

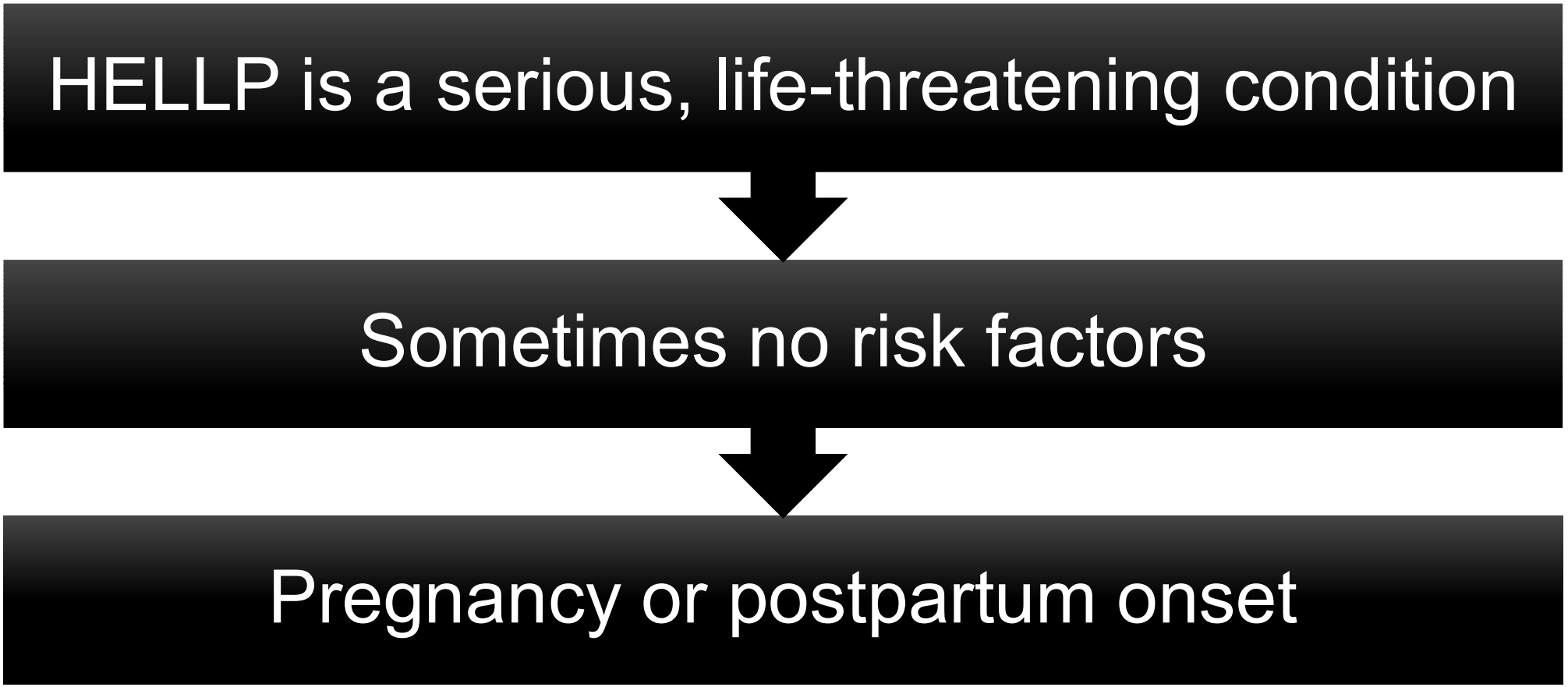
# Case Presentation (no risk factors)

- *Exhibited no prior risk factors:*
  - *no age>35,*
  - *no obesity,*
  - *no history of pre-eclampsia,*
  - *no history of DM or renal disease,*
  - *no history of multiple births,*
  - *no history of HTN*

# HELLP Abnormal Lab example

- **HEMOLYSIS** - Hematocrit 27% (Normal in third term: 33%-38%)
- **LIVER FUNCTION TESTS** - AST 1200, ALT 740 (Normal: 7-35 U/L)
- **PLATELETS** - 40,000/ml (Normal: 150,000-400,000/ml)

## Case Presentation (summary)



# Lasting effects of HDP

- Risks may emerge in the years following pregnancy:
  - PTSD, postpartum mood disorders, mental health impact
  - 3-4 x risk of HTN
  - 2 x risk of heart disease and stroke
  - Increased risk of developing diabetes
- People with HELLP: increased risk of HELLP and pre-eclampsia in future pregnancies

# The Role of the PHN

- Opportunities to educate and screen birthing people for BP:
  - Pregnancy – at community baby showers, at BP screening clinics, partner with OB offices
  - Postpartum – home visits, partner with birth hospitals
  - HEAR HER CONCERNS Campaign (CDC)

# Collaboration with Community Organizations

- Library
- YMCA
- Playgroups sponsored by CFCE (Coordinated Family & Community Engagement Network)
- Parent and Baby activity
- Baby Yoga class
- Recreation Department
- Religious Orgs (church, temple…)
- Advertise with Parent Groups
- WIC office

# Collaborate with American Heart Association

# The Role of the PHN (Continued)

- Council on Patient Safety and Health Care
  - Patient Clinical Summary: Severe Maternal Event (SME)
- Therapy with a trauma informed provider, specializing in postpartum
- Postpartum Support International (PSI) offers many free, virtual support groups

# Role of the PHN (cont'd)

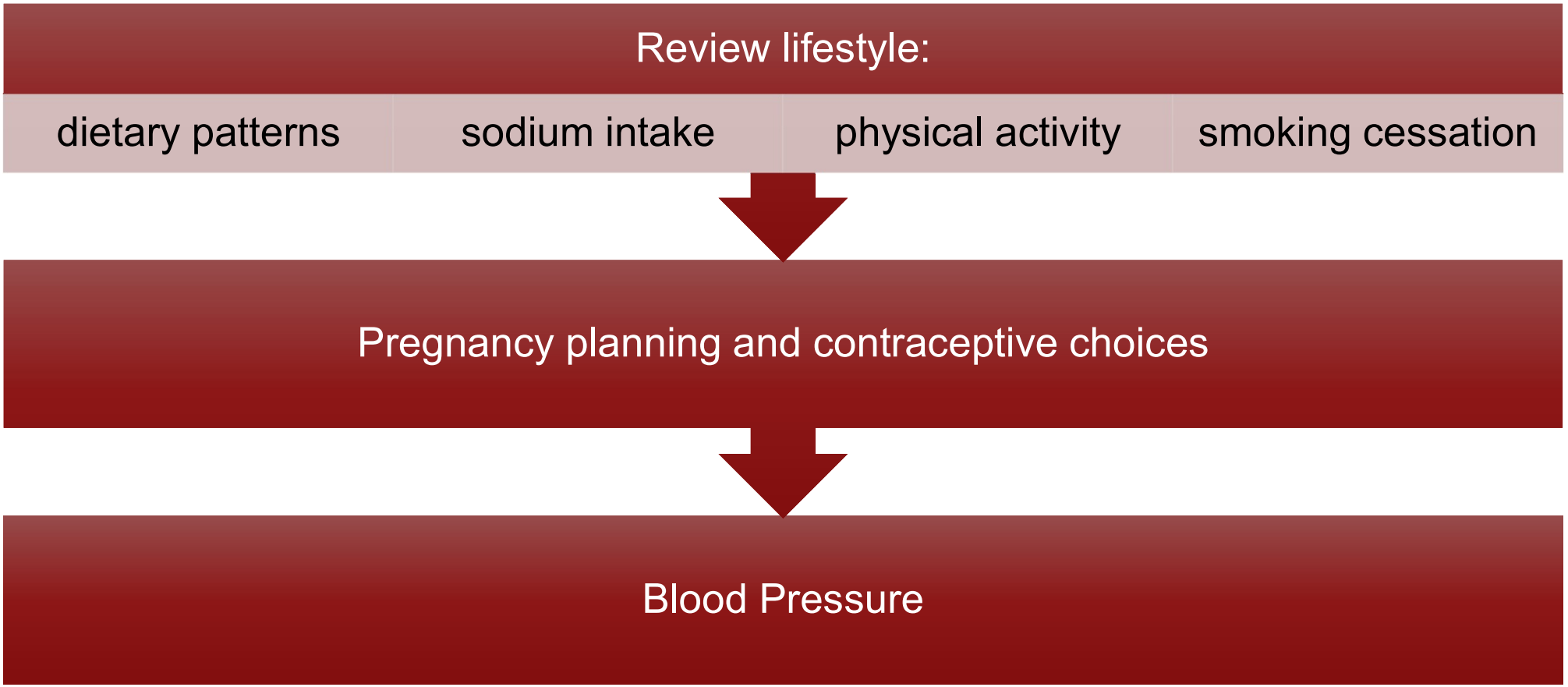


**Table 1.** Preferred* Oral Antihypertensive Medications in Pregnancy and Lactation[11,55]

| Preferred Medications in Pregnancy | Starting Dose | Maximum Dose | Precautions and Considerations |
|---|---|---|---|
| **First-Line Agents** | | | |
| Labetalol | 100 to 200 mg twice daily | 2400 mg per 24 hours | • Asthma, acute decompensated cardiac function, bradycardia<br>• May require three times daily dosing due to increased metabolism during pregnancy |
| Nifedipine (extended release) | 30 mg daily | 120 mg per 24 hours | |
| Methyldopa† | 250 mg two to three times daily | 3000 mg per 24 hours | |
| **Second-Line Agents** | | | |
| Hydralazine | 10 mg four times daily | 300 mg per 24 hours | Reflex tachycardia |
| Chlorthalidone or hydrochlorothiazide | 12.5 mg daily | 50 mg per 24 hours | |
| Clonidine | 0.1 mg transdermal daily or 0.1 to 0.3 mg by mouth twice daily | 0.3 mg transdermal or 0.6 mg by mouth per 24 hours | Rebound hypertension with abrupt cessation |
| **Preferred Medications in Lactation** | **Starting Dose** | **Maximum Dose** | **Precautions and Considerations** |
| Nifedipine (extended release) | 30 mg daily | 120 mg per 24 hours | |
| Enalapril, captopril, benazepril | Varies by agent | Varies by agent | Close follow-up of infant's weight; counsel on contraceptive plan |
| Labetalol | 100 to 200 mg twice daily | 2400 mg per 24 hours | Asthma, acute decompensated cardiac function, bradycardia |
| Hydrochlorothiazide | 12.5 mg daily | 50 mg per 24 hours | May decrease milk production |
| Hydralazine | 10 mg four times daily | 300 mg per 24 hours | Reflex tachycardia |

# Importance of Recognizing Symptoms

Complications often begin at home

Many women may not share s/s with MD for fear of over-reacting, or forget to ask

PHNs may be first clinicians to observe symptoms

HDP can be RAPIDLY progressing disorders and may occur in between normal OB appts or before regularly scheduled 6 wk visit postpartum

Delayed recognition increases risk of severe outcomes

You are STILL AT RISK after your baby is born!

# Postpartum Preeclampsia

## What is it?

Postpartum preeclampsia is a serious disease related to high blood pressure. It can happen to anyone who has just had a baby **up to 6 weeks after the baby is born**.

## Risks to You

- Seizures
- Stroke
- Organ damage
- Death

## Warning Signs


Stomach pain


Severe headaches


Feeling nauseous or throwing up


Seeing spots (or other vision changes)


Swelling in your hands and face


Shortness of breath

## What can you do?

- Ask if you should follow up with your doctor within one week of discharge.
- Keep all follow-up appointments.
- Trust your instincts.
- Watch for warning signs. If you notice any, call your doctor. If you can't reach your doctor, call 911 or go directly to an emergency room and report you have been pregnant.

For more information, go to www.stillatrisk.org

PREECLAMPSIA FOUNDATION


Call your healthcare provider right away
If you can't reach your healthcare provider, call 911 or go to an Emergency Department and report that you have recently been pregnant.
• Blood pressure at or exceeding 140/90
• Severe headache that won't go away
• Vision changes
• Stomach pain
• Swelling in your hands and face
• Feeling nauseous or throwing up
Have someone take you to the ER or call 911
• Blood pressure at or exceeding 160/110
• Shortness of breath or trouble breathing
• Seeing spots
• Seizures
PREECLAMPSIA FOUNDATION
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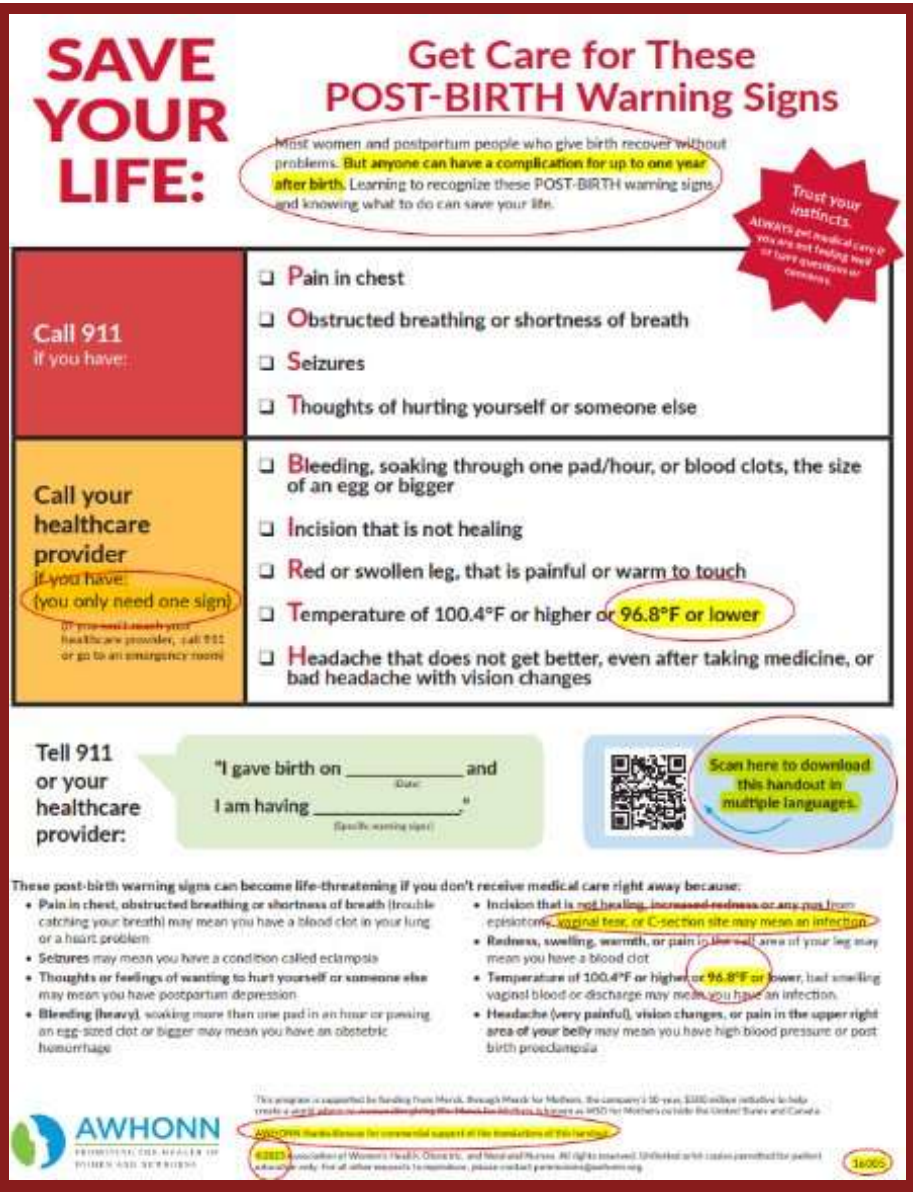

# SAVE YOUR LIFE:

## Get Care for These POST-BIRTH Warning Signs

Most women and postpartum people who give birth recover without problems. **But anyone can have a complication for up to one year after birth.** Learning to recognize these POST-BIRTH warning signs and knowing what to do can save your life.

Trust your instincts. Always get medical care if you are not feeling well or have questions or concerns.

**Call 911**
If you have:

- ❑ Pain in chest
- ❑ Obstructed breathing or shortness of breath
- ❑ Seizures
- ❑ Thoughts of hurting yourself or someone else

**Call your healthcare provider**
if you have:
(you only need one sign)

If you can't reach your healthcare provider, call 911 or go to an emergency room)

- ❑ Bleeding, soaking through one pad/hour, or blood clots, the size of an egg or bigger
- ❑ Incision that is not healing
- ❑ Red or swollen leg, that is painful or warm to touch
- ❑ Temperature of 100.4°F or higher or 96.8°F or lower
- ❑ Headache that does not get better, even after taking medicine, or bad headache with vision changes

**Tell 911 or your healthcare provider:**

"I gave birth on _____ and
(Date)
I am having _____."
(Specific warning sign)

Scan here to download this handout in multiple languages.

**These post-birth warning signs can become life-threatening if you don't receive medical care right away because:**

- **Pain in chest, obstructed breathing or shortness of breath** (trouble catching your breath) may mean you have a blood clot in your lung or a heart problem
- **Seizures** may mean you have a condition called eclampsia
- **Thoughts or feelings of wanting to hurt yourself or someone else** may mean you have postpartum depression
- **Bleeding (heavy)**, soaking more than one pad in an hour or passing an egg-sized clot or bigger may mean you have an obstetric hemorrhage
- **Incision that is not healing, increased redness or any pus** from episiotomy, vaginal tear, or C-section site may mean an infection
- **Redness, swelling, warmth, or pain** in the calf area of your leg may mean you have a blood clot
- **Temperature of 100.4°F or higher or 96.8°F or lower**, bad smelling vaginal blood or discharge may mean you have an infection.
- **Headache (very painful), vision changes, or pain in the upper right area of your belly** may mean you have high blood pressure or post birth preeclampsia

AWHONN

This program is supported by funding from Merck, through Merck for Mothers, the company's 10-year, $500 million initiative to help create a world where pregnancy during the March of Dimes is known as MSD for Mothers outside the United States and Canada.

AWHONN thanks Elsevier for commercial support of the translations of this handout.



1e005

# CHECK KNOW SHARE

## CHECK

### before taking your blood pressure

go to the bathroom

sit quietly 3-5 minutes

within 30 minutes DO NOT


### take your blood pressure

- sit up with your arm propped at the same level as your heart, place left bare arm through the cuff above your elbow
- tighten the cuff around your arm and secure the Velcro fastener
- press START, cuff will inflate squeezing your arm then deflate, breathe normally, don't talk
- record your numbers twice a day

## KNOW

### your numbers


**Normal**

**Call your healthcare provider**

**Seek immediate medical care**

**If either your top (systolic) or bottom (diastolic) number fall out of the normal range, take action**

### why blood pressure is important during pregnancy

- determines how your pregnancy is managed
- informs timing of delivery
- signals potential risks and complications to mother and baby, such as preeclampsia and HELLP Syndrome, during pregnancy and right afterwards

## SHARE

- discuss your blood pressure log at all prenatal and postpartum appointments
- act upon yellow or red zone numbers right away - don't wait for a scheduled appointment

PREECLAMPSIA™ FOUNDATION

www.preeclampsia.org

# Summary

HDP occur in pregnancy and postpartum

Symptoms may resemble other non-threatening issues and may be missed

PHNs play a critical role in education, screening, and referral to care

# Questions?

- Thank you!

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