DIAGNOSIS AND TREATMENT OF HYPERTENSION IN PREGNANCY

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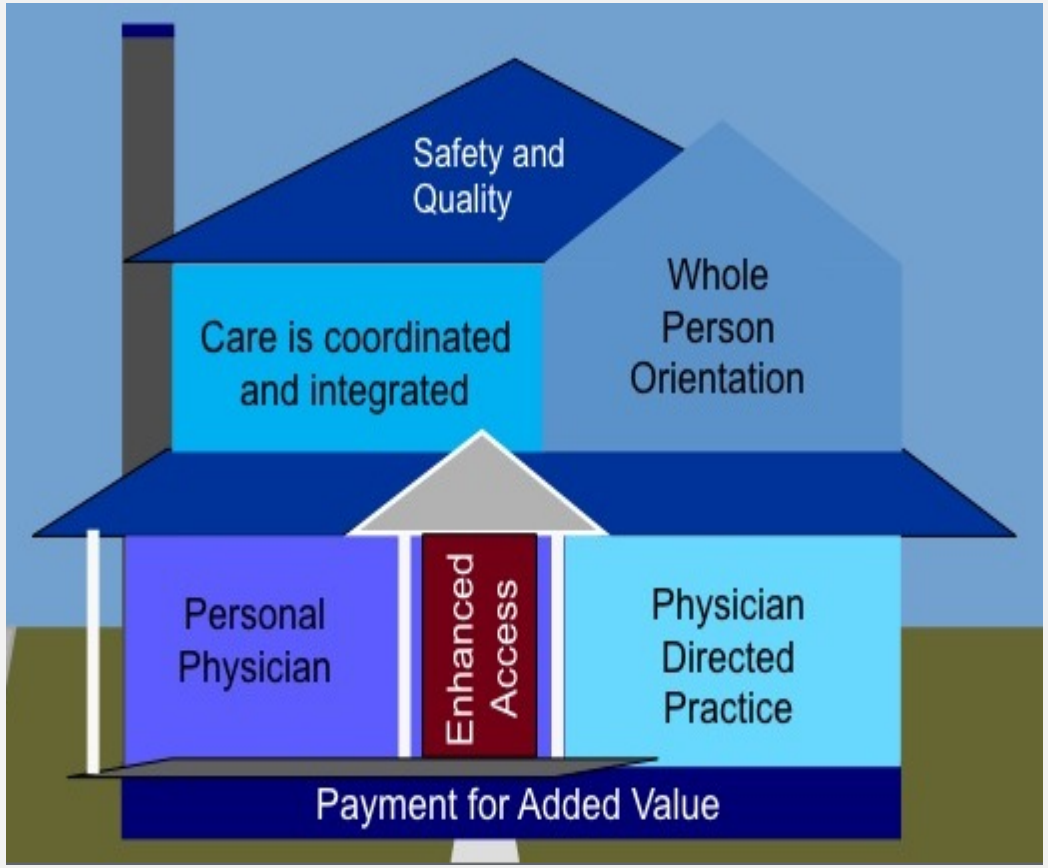
OBJECTIVES

- Overview of Pregnancy Medical Home Model
- Review diagnostic criteria of hypertensive spectrum in pregnancy
- Discuss collaborative management of patients
- Review 4th trimester management of hypertensive patients

WHAT IS A MEDICAL HOME?

A model of primary care that is patient – centered, comprehensive, team – based, coordinated, accessible, and focused on quality and safety. Hallmarks of the medical home are:

- Increased access to care
- Multiple locations
- Team based approach
- Multiple service lines under one roof



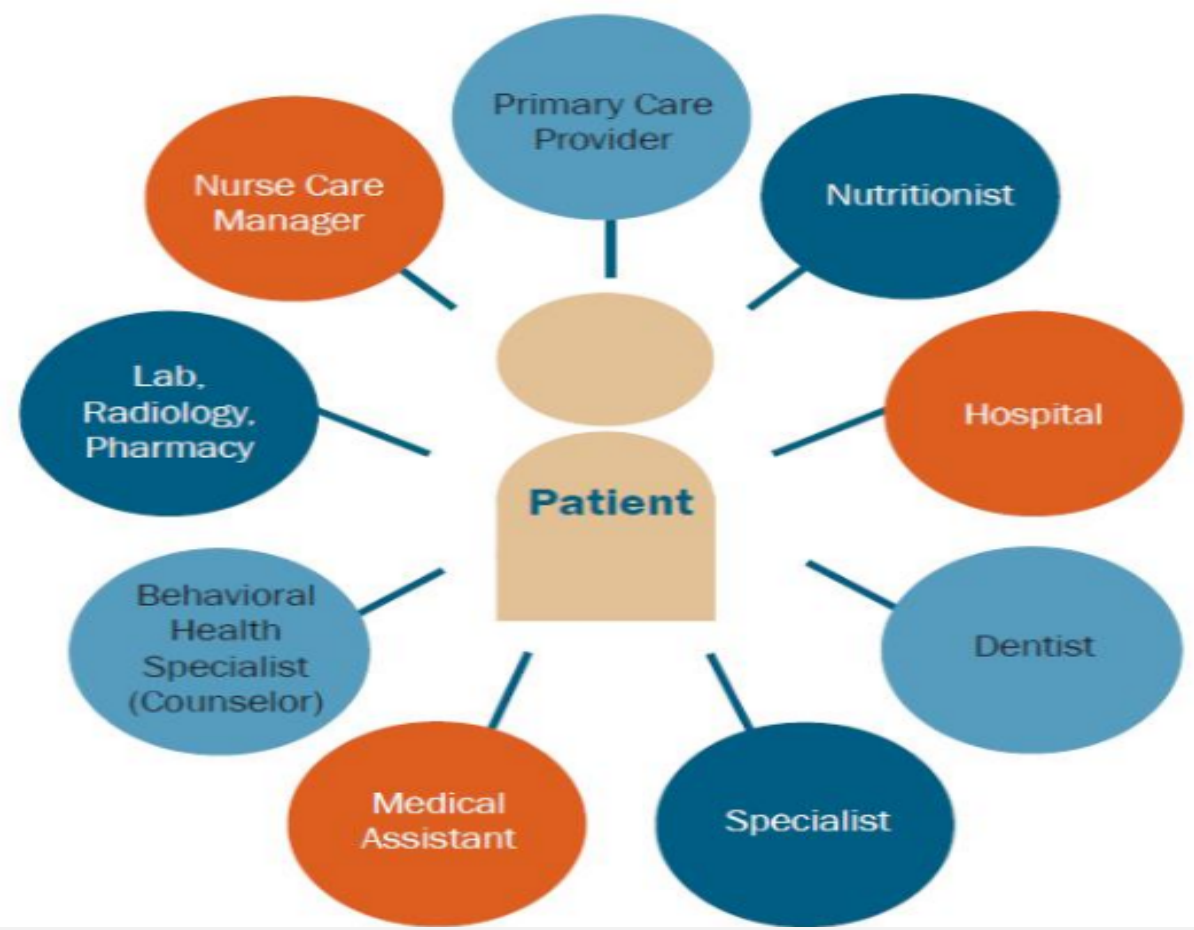
Services

- Obstetrics/Gynecology
- Pediatrics
- Behavioral Health
- Optometry
- Dentistry
- Radiology
- Pathology
- Pharmacy
- Speech Therapy

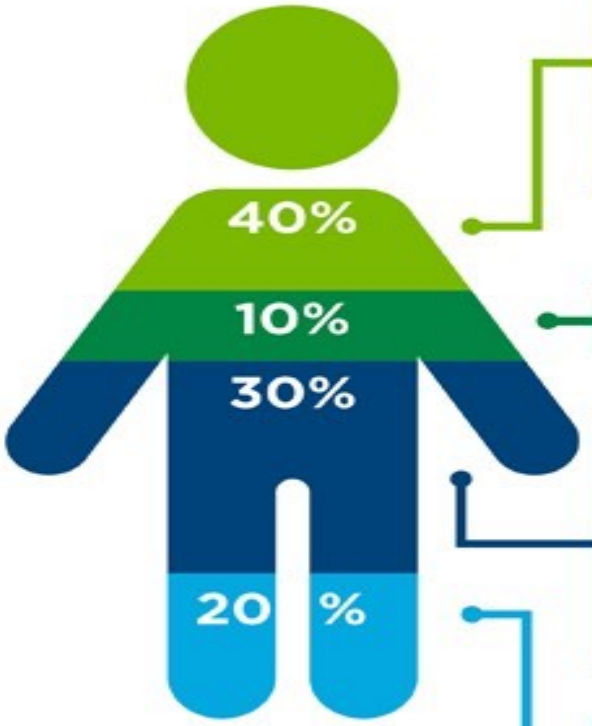
Team Members

- Physicians
- Certified Nurse Midwives
- Psychologists
- Pharmacists
- Registered Nurses
- Medical Assistants
- Clinical Therapists
- Social Workers
- Nutritionists
- Health Educators
- Others

MEDICAL HOME



What Goes Into Your Health?



Socioeconomic Factors

Education | Job Status | Family/ Social Support | Income | Community Safety

Physical Environment

Health Behaviors

Tobacco Use | Diet & Exercise | Alcohol Use | Sexual Activity

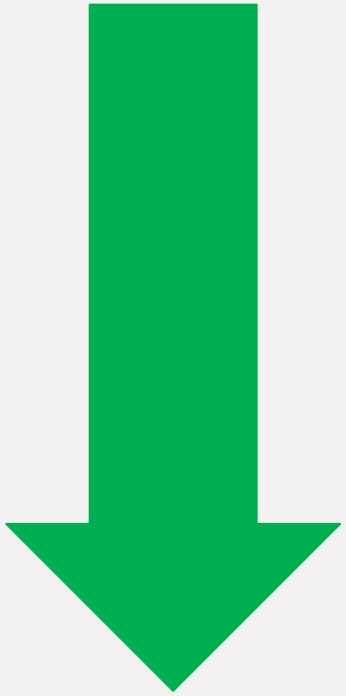
Health Care

Access to Care
Quality of Care

Source: Institute for Clinical Systems Improvement, Going Beyond Clinical Walls: Solving Complex Problems (October 2014)

The Bridgespan Group

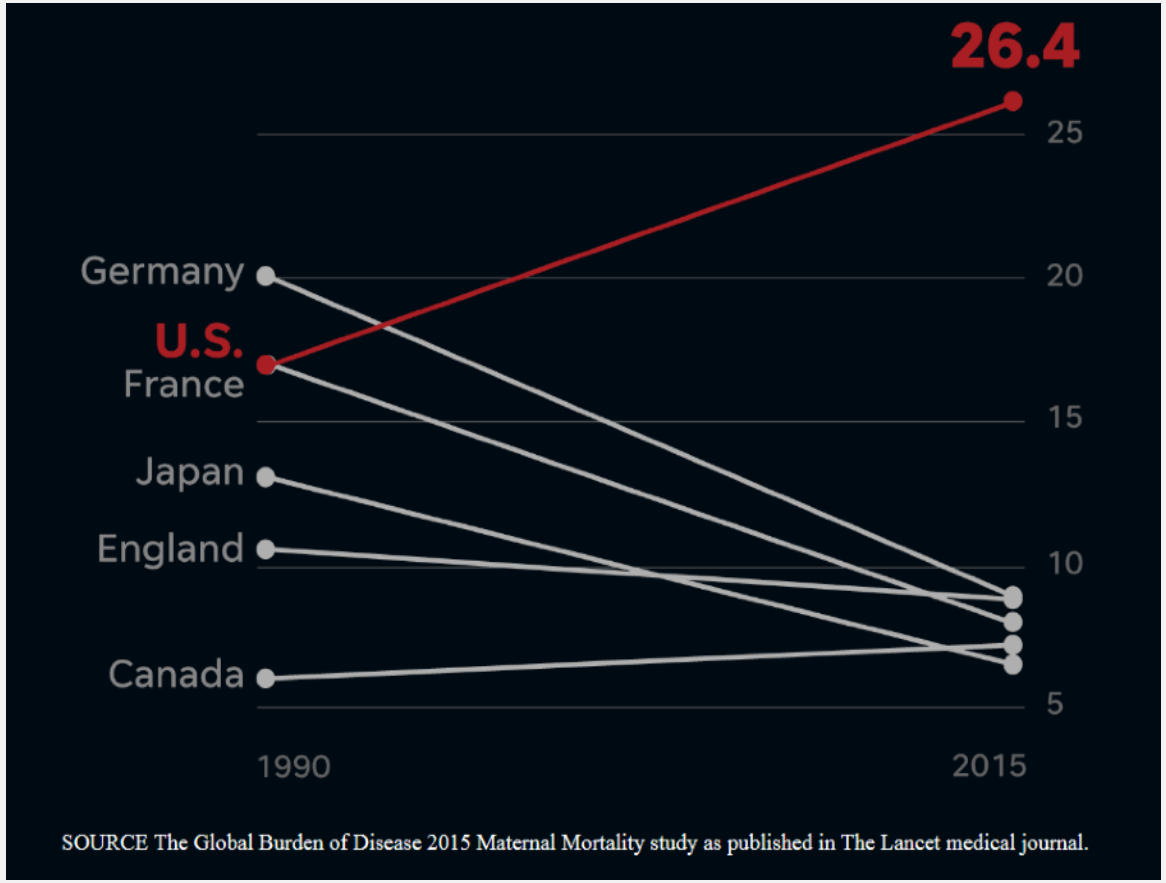
IMPACT OF THE MEDICAL HOME



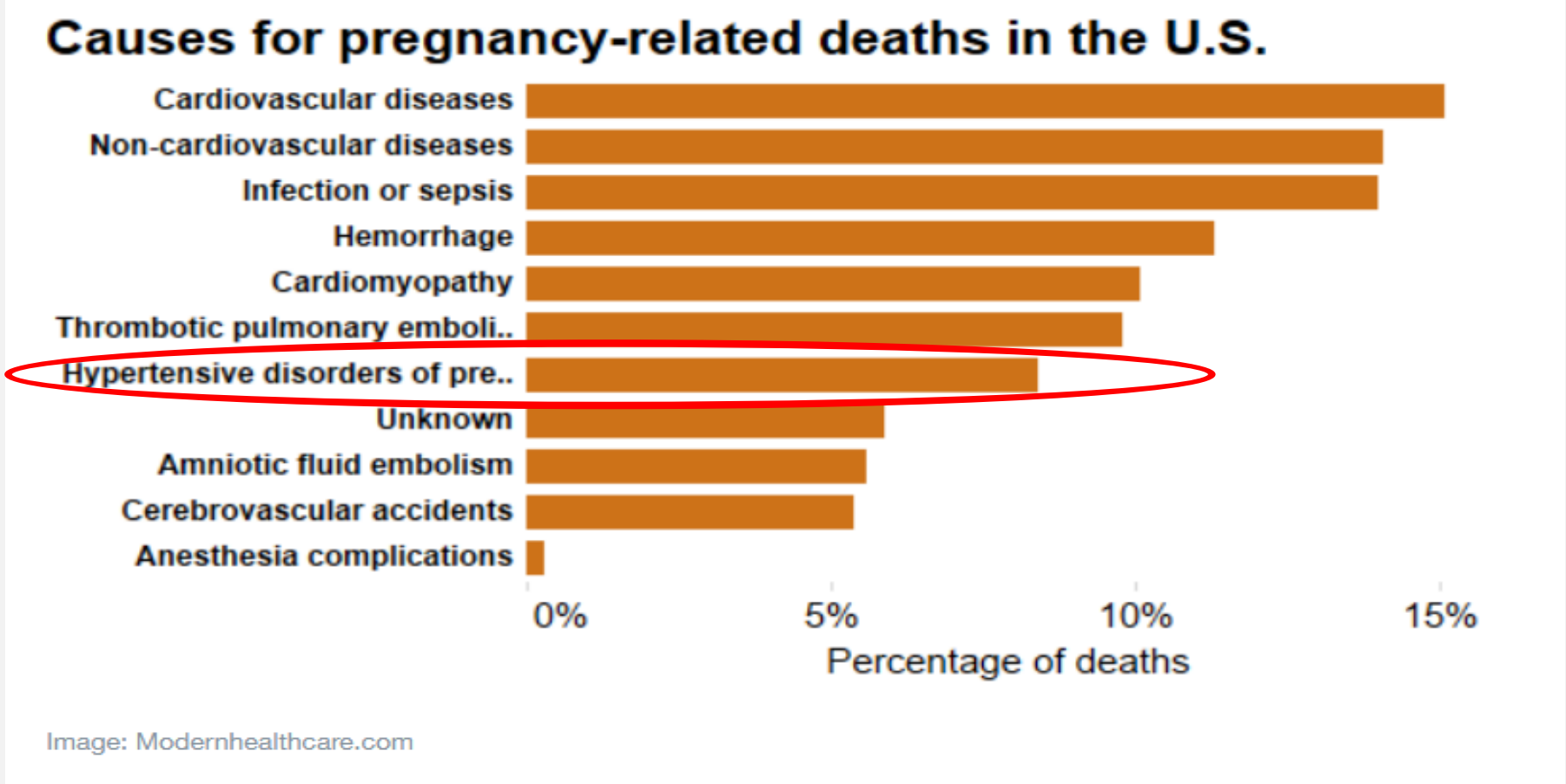
- ✓ ED visits
- ✓ Hospitalizations
- ✓ Per member per month costs
- ✓ Readmissions following discharge
- ✓ Length of stay

MATERNAL MORTALITY IN THE US

- The United States has the highest maternal mortality among developed nations
- Maternal mortality in Texas and specifically in Harris County in unacceptably high
  - 14.6 -18.6 deaths/ 100,000



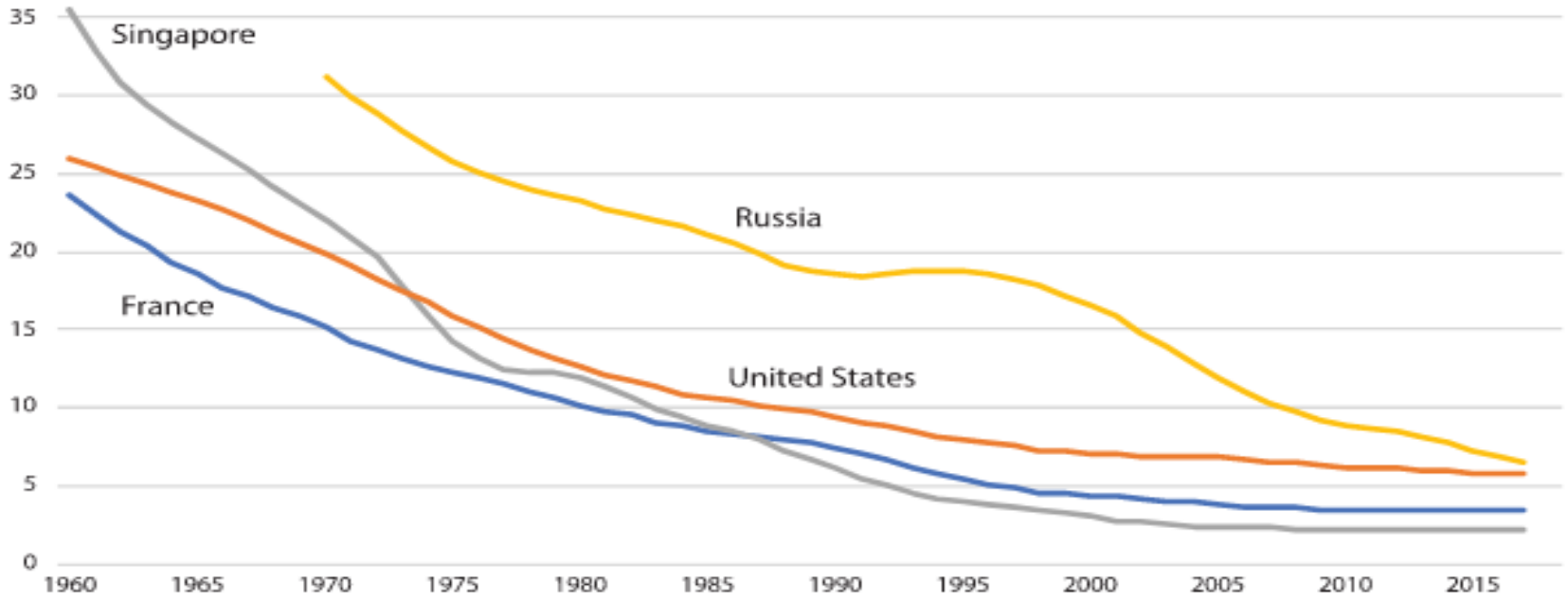
CAUSES OF MATERNAL MORTALITY



INFANT MORTALITY IN US

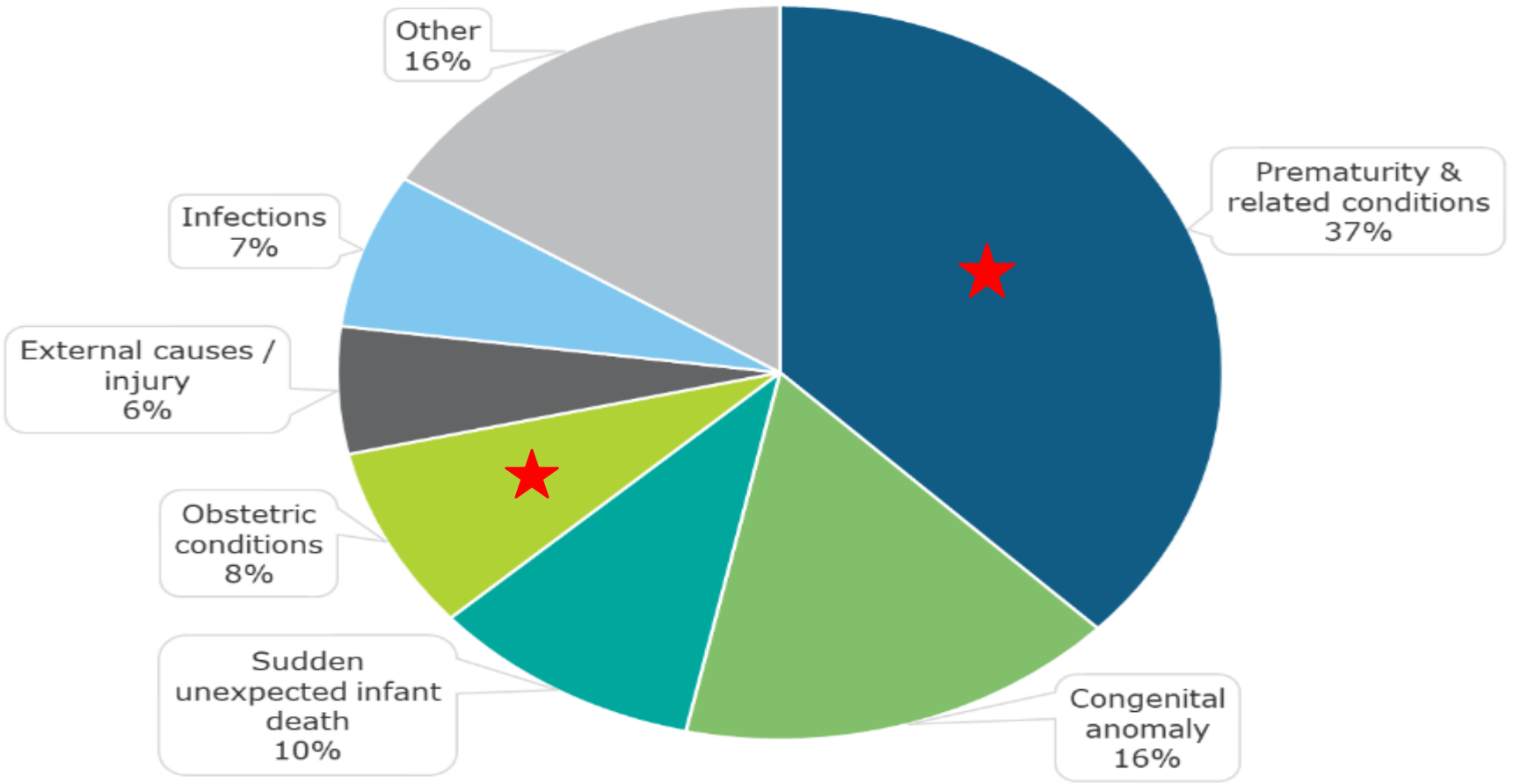
U.S. surpassed by Singapore

The infant mortality rate (deaths per 1,000 live births) used to be much higher in Singapore than in the U.S. Now it is the reverse, and the U.S. and the Russian rates are nearly the same.



Source: World Bank Open Data

Causes of infant mortality
Monroe County (2013-2015)

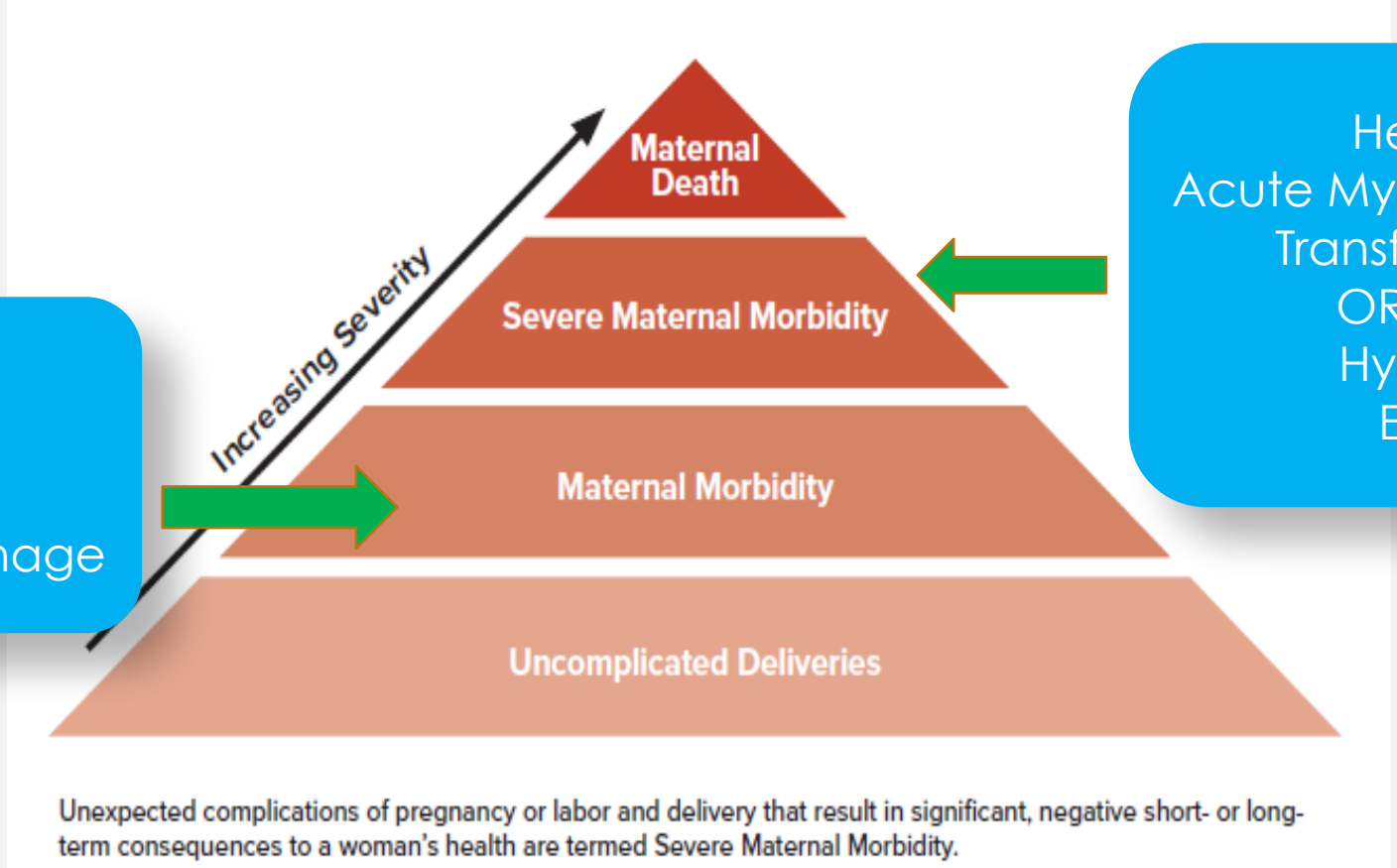


Source: NYSDOH Vital Records; Analysis by the Monroe County Department of Public Health and Common Ground Health

Common Ground Health

MATERNAL MORTALITY DOESN'T JUST HAPPEN

Obesity
Hypertension
Diabetes
Postpartum hemorrhage



Unexpected complications of pregnancy or labor and delivery that result in significant, negative short- or long-term consequences to a woman's health are termed Severe Maternal Morbidity.

Heart Failure
Acute Myocardial Infarction
Transfusion > 4 units
OR take back
Hysterectomy
Eclampsia

THE PROBLEM

- Leading cause of maternal and perinatal morbidity
  - In the U.S. 12% of maternal deaths are attributable to preeclampsia and eclampsia
- Occurs in 5-10% pregnancies worldwide
- Accounts for 15% of preterm births in the U.S.
- Infants born to mothers with pre-eclampsia are at increased risk of growth restriction, NICU admission and neonatal death
- In 2012, the cost of preeclampsia within the first 12 months of delivery was $2.18 billion in the United States

WHAT NOW?

- Previous c - section
- Depression
- GDM in previous pregnancy
- Elevated Blood pressure
- Twins

RECOGNIZE THE RISK FACTORS

Box 1. Risk Factors for Preeclampsia

Nulliparity
Multifetal gestations
Preeclampsia in a previous pregnancy
Chronic hypertension
Pregestational diabetes
Gestational diabetes
Thrombophilia
Systemic lupus erythematosus
Prepregnancy body mass index greater than 30
Antiphospholipid antibody syndrome
Maternal age 35 years or older
Kidney disease
Assisted reproductive technology
Obstructive sleep apnea

ACOG Practice Bulletin, Number 202

Annals of Internal Medicine

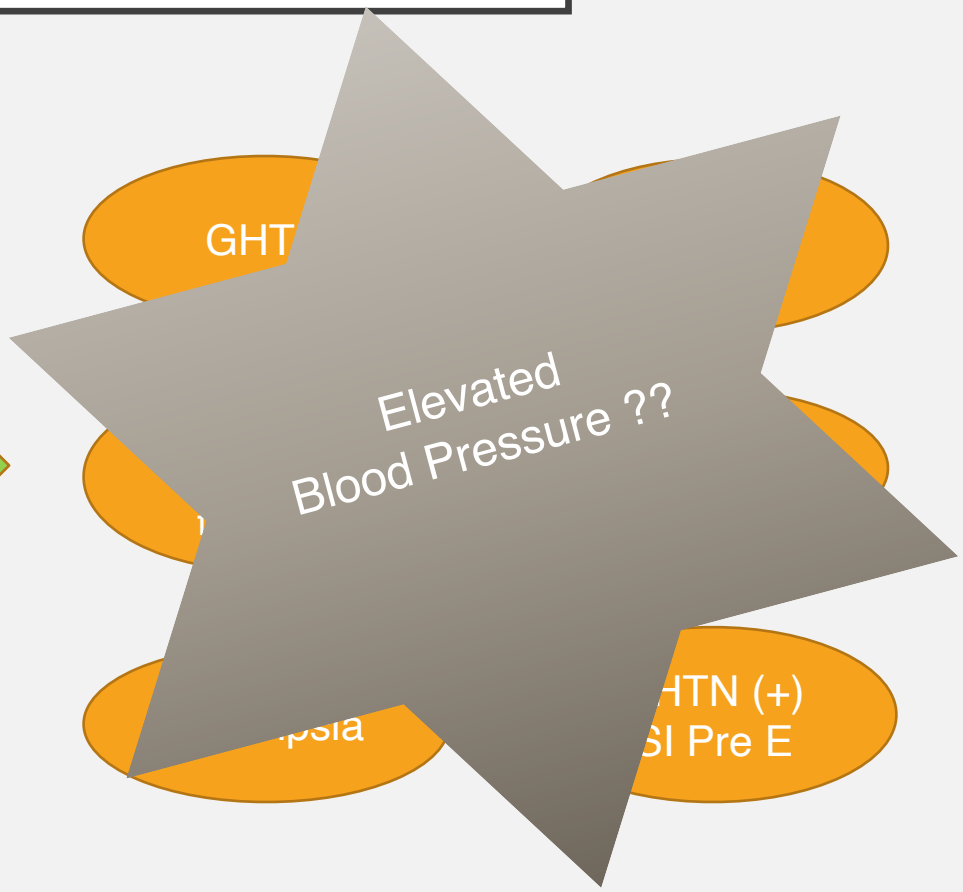
U.S. Preventive Services TASK FORCE
www.USPreventiveServicesTaskForce.org

LOW-DOSE ASPIRIN USE FOR THE PREVENTION OF MORBIDITY AND MORTALITY FROM PREECLAMPSIA CLINICAL SUMMARY OF U.S. PREVENTIVE SERVICES TASK FORCE RECOMMENDATION

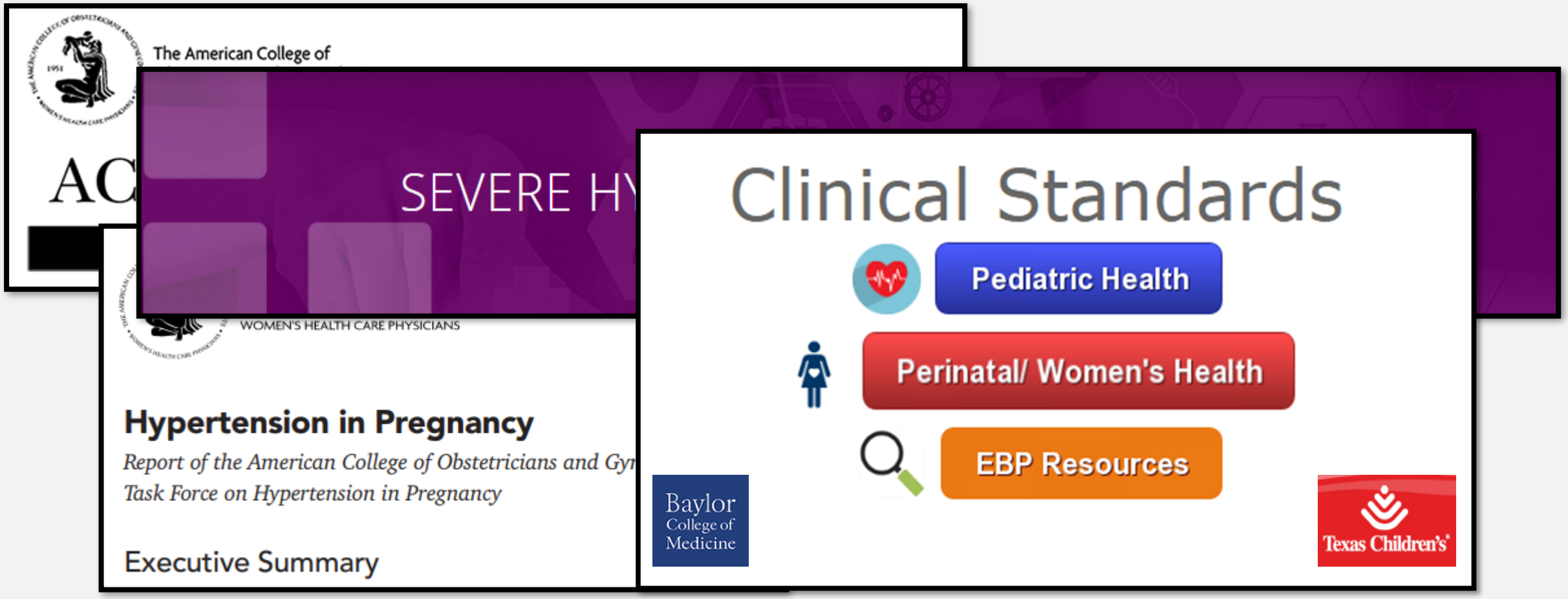
Population	Asymptomatic pregnant women who are at high risk for preeclampsia
Recommendation	Prescribe low-dose (81 mg/d) aspirin after 12 weeks of gestation. Grade: B

Risk Assessment	Pregnant women are at high risk for preeclampsia if they have 1 or more of the following risk factors: • History of preeclampsia, especially when accompanied by an adverse outcome • Multifetal gestation • Chronic hypertension • Type 1 or 2 diabetes • Renal disease Autoimmune disease (i.e., systemic lupus erythematosus, the antiphospholipid syndrome)
Preventive Medication	Low-dose aspirin (60 to 150 mg/d) initiated between 12 and 28 weeks of gestation reduces the occurrence of preeclampsia, preterm birth, and IUGR in women at increased risk for preeclampsia. The harms of low-dose aspirin in pregnancy are considered to be no greater than small.
Balance of Benefits and Harms	There is a substantial net benefit of daily low-dose aspirin to reduce the risk for preeclampsia, preterm birth, and IUGR in women at high risk for preeclampsia.
Other Relevant USPSTF Recommendations	The USPSTF recommends that all women planning or capable of pregnancy take a daily supplement containing 0.4 to 0.8 mg (400 to 800 μg) of folic acid. This recommendation is available at www.uspreventiveservicestaskforce.org.

MAKE THE DIAGNOSIS



RESOURCES


The American College of
SEVERE HY
WOMEN'S HEALTH CARE PHYSICIANS
Hypertension in Pregnancy
Report of the American College of Obstetricians and Gyn
Task Force on Hypertension in Pregnancy
Executive Summary
Clinical Standards
Pediatric Health
Perinatal/ Women's Health
EBP Resources
Baylor College of Medicine
Texas Children's

GESTATIONAL HYPERTENSION

- SBP > or = 140 **OR** DBP > or = 90 on two occasions at least 4 hours apart
- Greater than 20 weeks gestation
- Previously normal blood pressure

AND

- No proteinuria
- No symptoms
- No laboratory abnormalities

MILD
PRE -ECLAMPSIA
+
SEVERE
PRE - ECLAMPSIA

PRE – ECLAMPSIA W/O SEVERE FEATURES

- SBP > or = 140 **OR** DBP > or = 90 on two occasions at least 4 hours apart
- Greater than 20 weeks gestation
- Previously normal blood pressure

AND

- **Positive proteinuria**
- No symptoms
- No laboratory abnormalities

PRE – ECLAMPSIA WITH SEVERE FEATURES

- SBP > or = 160 **OR** DBP > or = 110 on two occasions at least 4 hours apart
- Greater than 20 weeks gestation
- Previously normal blood pressure

AND

- Positive proteinuria

OR

- New Onset

- Thrombocytopenia	- Renal insufficiency	- Cerebral or visual disturbances
- Elevated LFTS	- RUQ pain	- Pulmonary Edema

CHRONIC HYPERTENSION

- Hypertension diagnosed:
  - Before pregnancy
  - Before 20 weeks gestation
  - During pregnancy for the first time that doesn’t resolve during the postpartum period (12 weeks)

SUPERIMPOSED PRE-ECLAMPSIA

- Sudden increase in BP that was initially well controlled
- Frequent medication titration to control blood pressure that was previously well controlled
- Sudden onset or increase in proteinuria

** SI Pre E with and without severe features (similar diagnostic criteria as Pre E)*

CASE #1- DIAGNOSIS?

38 yo G2P1001 hispanic female presents for prenatal care at 13 weeks gestation. Her OB history is significant for one previous c-section. Her PMH is significant for TIA in October 2019, maternal obesity and Factor V Leiden mutation.

Ultrasound evaluation reveals mono-di twin gestation. Prenatal vitals for the first 4 visits are:

Prenatal Vitals

Reading Date	GA	Prenatal Vitals	Urine Albumin/Glucose	Prenatal	Presentation
11/11/19	13w6d	135/86 / 178 lb 3.2 oz (80.8 kg) / 89	Trace / Negative / Negative / Trace / Negative / Negative	/ 148/155	TRANSVERSE
12/2/19	16w6d	137/81 / 183 lb (83 kg) / 78			
12/9/19	17w6d	154/89 ! / 182 lb 9.6 oz (82.8 kg) / 73		/ 138/144 / Present	
12/9/19	17w6d	135/91 ! / / 71			
TWG: 5 lb 9.6 oz (2.54 kg)		Pregravid weight: 177 lb (80.3 kg)		Height: 157.5 cm (5' 2.01")	

RECOGNIZE THE RISK FACTORS

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Nulliparity
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Preeclampsia in a previous pregnancy
Chronic hypertension
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Thrombophilia
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Maternal age 35 years or older
Kidney disease
Assisted reproductive technology
Obstructive sleep apnea

ACOG Practice Bulletin, Number 202

CASE#1

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CASE #1

- Diagnosis – CHTN
- Initial PIH panel including P/C ratio (< 0.30) are normal

At 31 weeks gestation her blood pressures are noted to be 174/101, 165/97, 170/100. Her P/C ratio is 0.65. What is her new diagnosis?

CASE #2 - DIAGNOSIS

23 yo G2P0010 presents to prenatal care at 11 weeks gestation.

PMH: Crohn's disease

PSH: partial bowel resection in 2018

PNC: IUGR, normal testing

She is scheduled for IOL at 39 weeks. Pt delivers via pLTCS 2/2 arrest of labor. On POD 1 the pt reports persistent HA. Vitals are:

	BP	Temp	Temp src	Pulse	Resp	SpO2
0500	**(!) 146/103**	—	—	78	18	—
0457	**(!) 143/99**	—	—	72	18	—
0455	**(!) 160/101**	98.6 °F (37 °C)	Oral	82	18	—
0208	140/70	—	—	71	—	—
0117	**(!) 142/104**	98 °F (36.7 °C)	Oral	76	18	98 %
0110	**(!) 168/113**	98 °F (36.7 °C)	Oral	71	18	98 %
2050	137/90	97.8 °F (36.6 °C)	Oral	87	18	98 %
1615	137/83	97.5 °F (36.4 °C)	Oral	89	18	98 %
1101	136/84	97.4 °F (36.3 °C)	Oral	83	18	98 %
0719	131/78	97.9 °F (36.6 °C)	Oral	79	18	98 %

INPATIENT MANAGEMENT

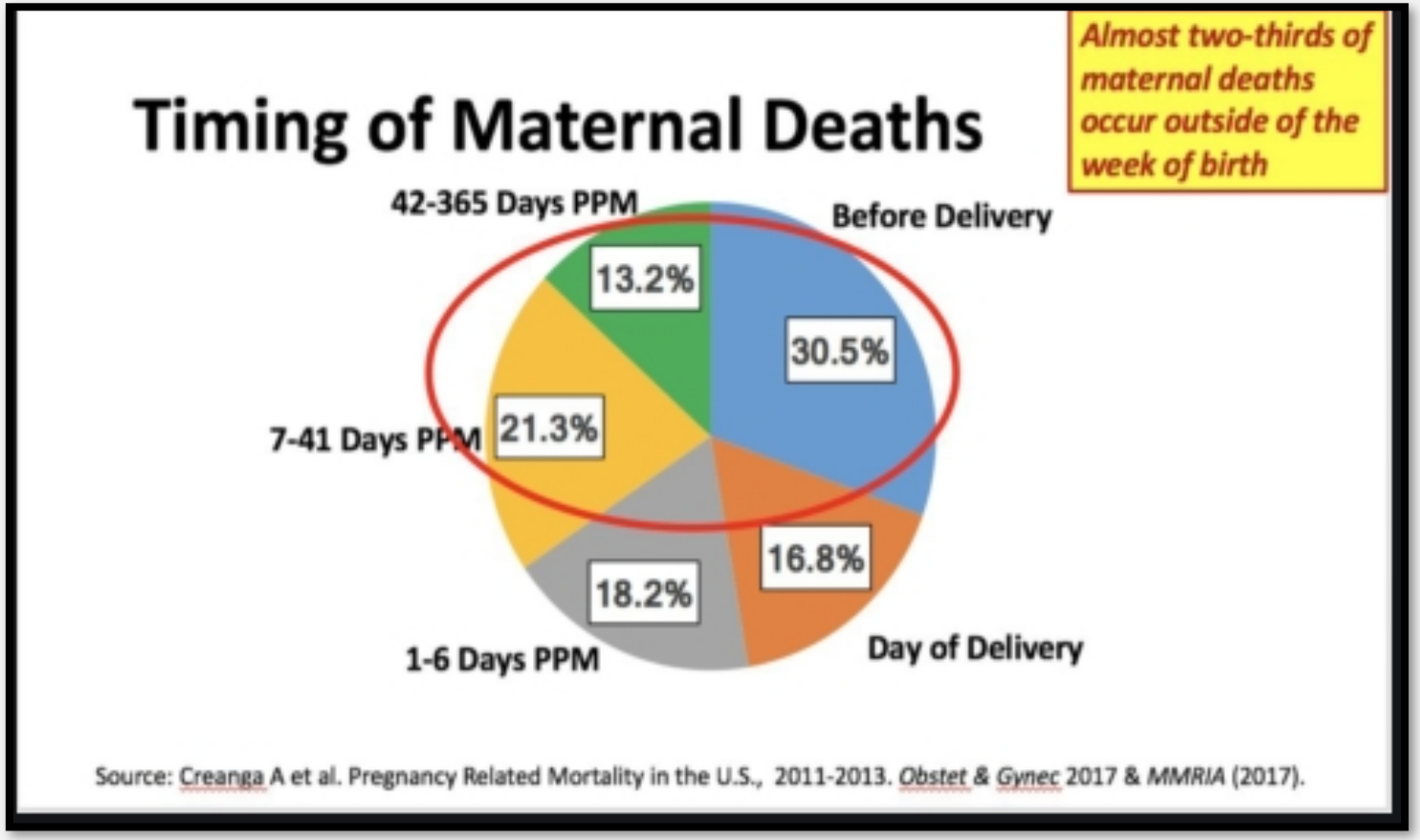
PREGNANCY IS A STRESS TEST

5x more likely to have long standing HTN

2x more likely to experience CV disease

Delivery is NOT the finish line!

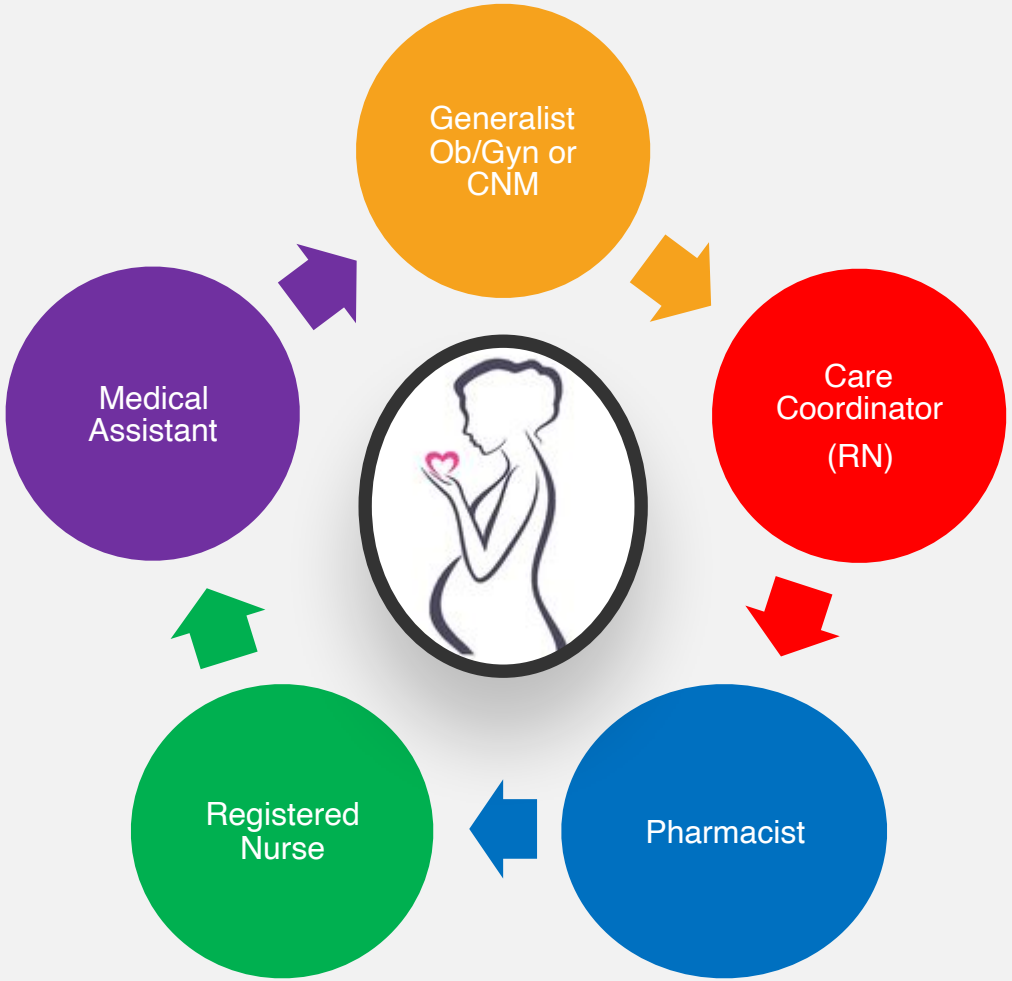
TIMING OF MATERNAL DEATHS



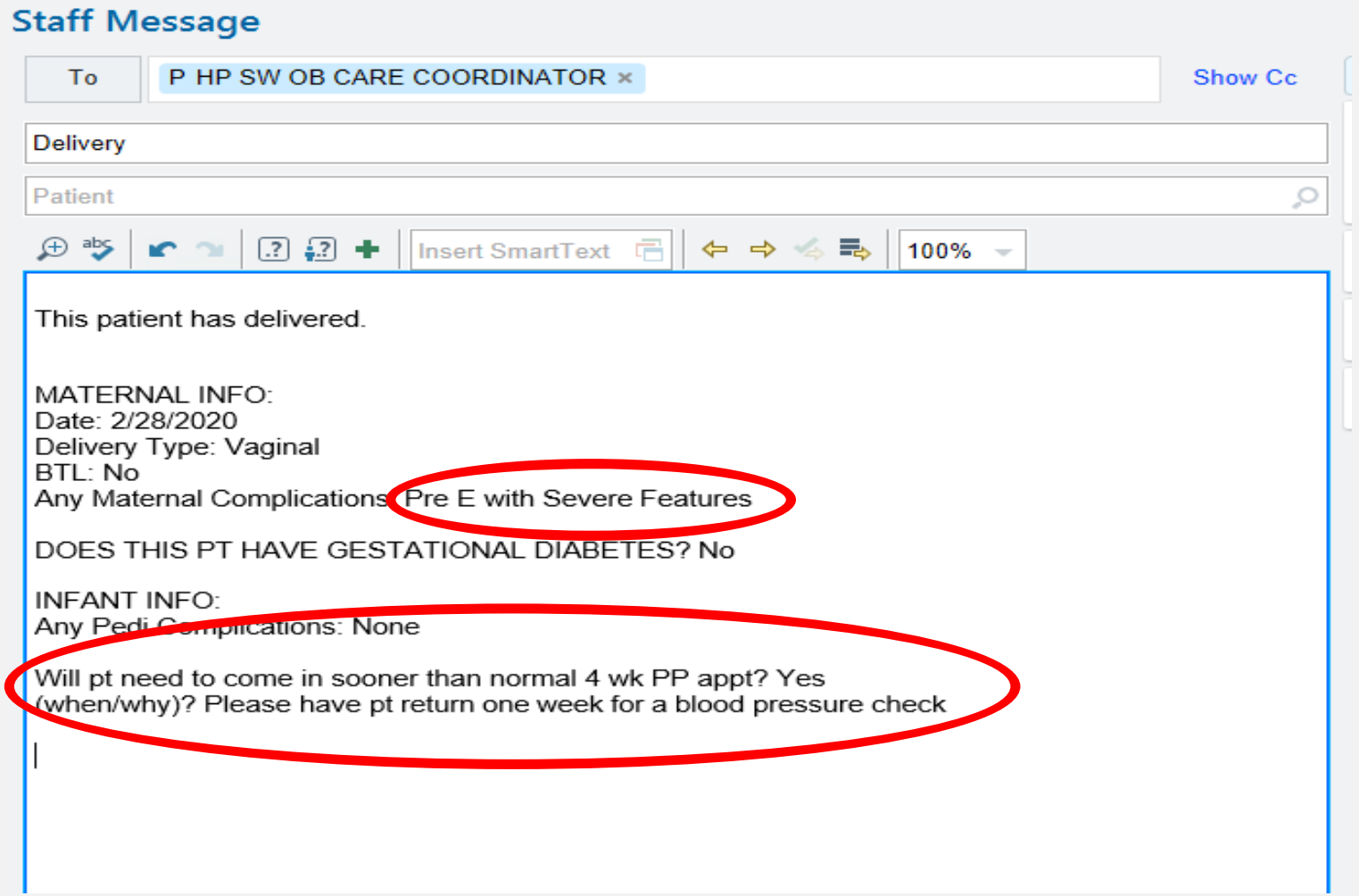
DELIVERY IS NOT THE FINISH LINE!

- The patient and your team need to understand the diagnosis
  - Elevated BP is not a diagnosis
- Specific discharge instructions
- Customized postpartum follow – up
  - BP check in one week
- Clinic team should know the questions to ask

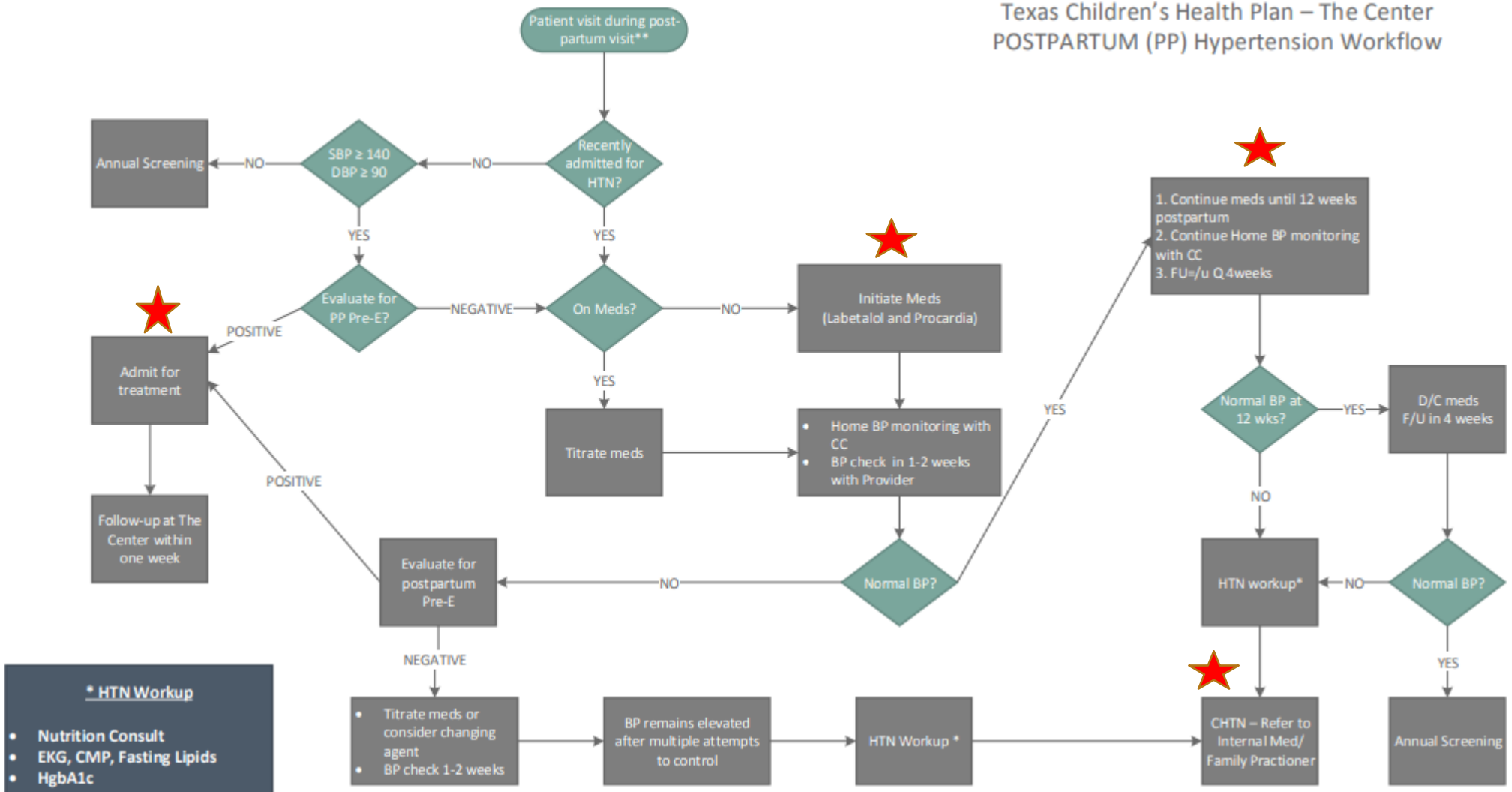
CARE COORDINATION



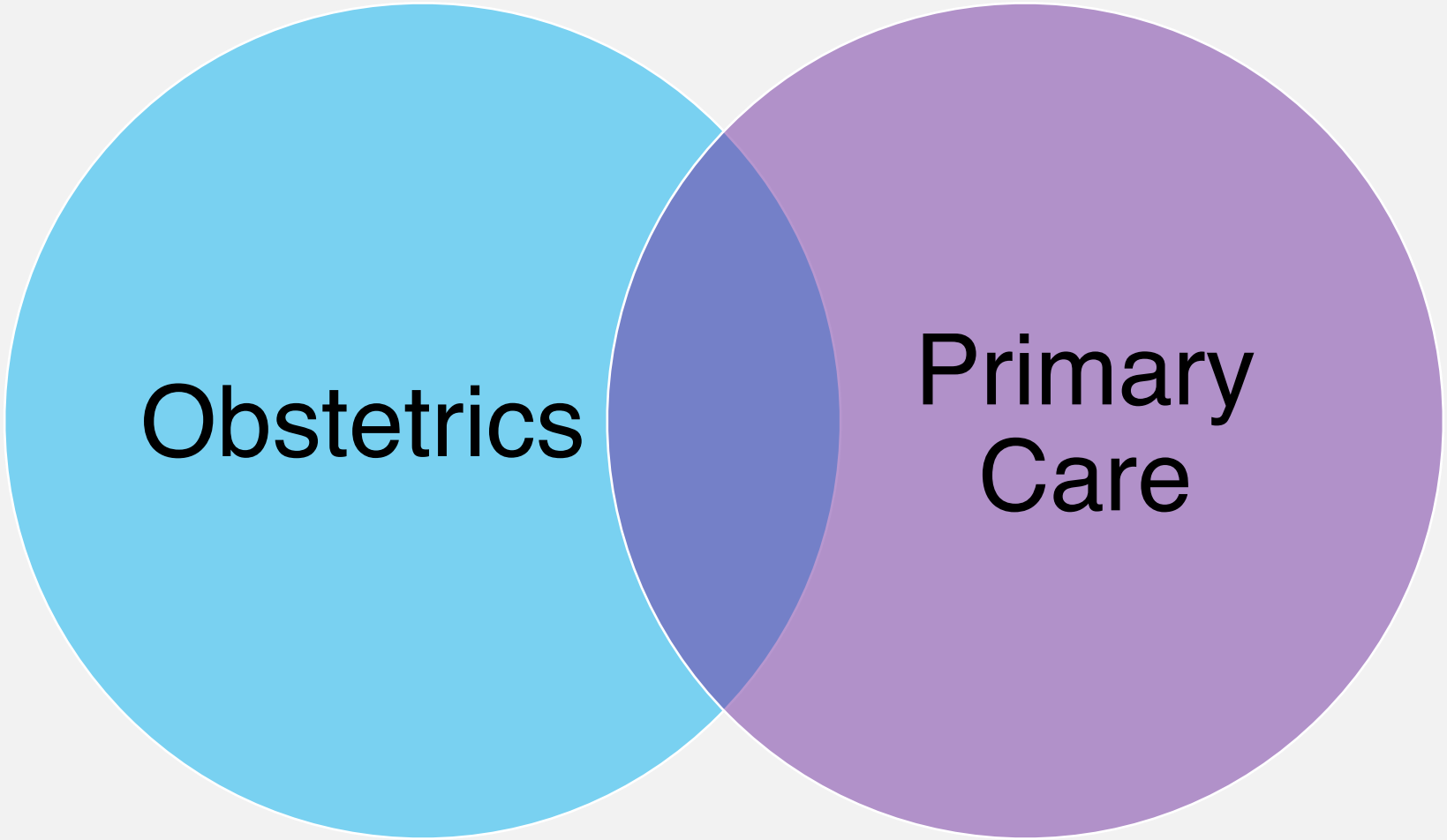
TEAM COMMUNICATION



Texas Children's Health Plan – The Center
POSTPARTUM (PP) Hypertension Workflow



*** Postpartum(PP) period defined as the period ≤ 12 weeks from delivery date***


Obstetrics
Primary Care

CONTINUITY OF CARE - HTW

- Medicaid patients should auto-enroll
- Patients can contact TMHP

IS THE PATIENT LIKELY TO BECOME PREGNANT AGAIN?

May get pregnant again

- Calcium Channel Blocker (CCB)
- Thiazide diuretic

*Beta-blockers are NOT first line!

Not likely to get pregnant again

- Angiotensin-converting enzyme inhibitor (ACEI)/ Angiotensin receptor blocker (ARB)
- CCB
- Thiazide diuretic

WHY?

- Both JNC8 and AHA recommend CCBs, thiazides, or ACEI/ARBs first line.
- If patient may get pregnant again, ACOG recommends against ACEI/ARBs due to fetotoxicity risk.

WHAT'S COVERED UNDER HTW?

*No beta-blockers!

Not Likely to Get Pregnant Again

ACEI

- Lisinopril
- Benazepril
- Enalapril
- Quinapril
- Fosinopril 40 mg, Ramipril 10 mg (PA for other strengths)*

ARBs

requires Prior Authorization

May Become Pregnant Again

CCBs

- Nifedipine ER
- Diltiazem ER
- Verapamil IR and ER
- Amlodipine 10 mg, Felodipine ER 10 mg (PA for other strengths)*

Thiazides

- Hydrochlorothiazide (HCTZ)

Delivery at 31 weeks gestation via stat c - section
Weight: 2lb 13oz
Maternal Hospital Stay: 10 days with ICU admission
Infant NICU stay: 52 days

QUESTIONS?