

## Hypertensive Disorders in Pregnancy: Changes in Diagnosis and Management Toward Improving Morbidity and Mortality

Thursday, June 12, 2014  
1:00pm - 2:30pm  
(Live presentation date)

1



## Learning Objectives

- Describe recent changes in classification and diagnostic criteria of hypertensive disorders in pregnancy (HDP).
- Identify highlights of current care for HDP, including risk assessment, evaluation and counseling, and medication management.
- Differentiate best practices for management of hypertensive disorders in pregnancy in different clinical settings (i.e., pre-hospital, outpatient, inpatient, emergency department and postpartum).
- Explain how to achieve continuous quality improvement across the care spectrum.



## Disclosure Statements

The planners and presenters do not have any financial arrangements or affiliations with any commercial entities whose products, research or services may be discussed in this activity.

No commercial funding has been accepted for this activity.



## Continuing Education Credits

- Credits available: CME, CNE, and CHES
- To obtain continuing education credits, participants must complete an evaluation and score 80% or above on the post-test.
- A link to the evaluation and post-test will be available after the webinar.
- Continuing education credits are available for this webinar until February 2016.

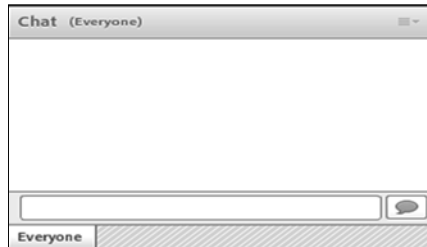


## Webinar Guidelines

You will listen to the audio through your computer speakers. Please make sure they are turned on and turned up.

Adobe Features you will use today:

- Chat Box
- Polls



Type any questions you have into the chat box, and they will be answered at the end of session.

Today's session is being recorded

## Hypertensive Disorders in Pregnancy

Changes in Diagnosis and Management  
Toward Improving Morbidity and Mortality

Presented by Peter Cherouny, MD

## Acknowledgements

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7



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8



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9



## Presenter



**Peter Cherouy, MD**

Dr. Peter Cherouy is an Emeritus Professor of Obstetrics, Gynecology and Reproductive Sciences at the University of Vermont College of Medicine. He is currently serving as the Chair of the Institute for Healthcare Improvement's (IHI's) IMPACT Perinatal Improvement Community. He also serves as an obstetric content and quality improvement expert for the New York State Perinatal Quality Collaborative and was the lead author of the IHI white paper "Idealized Design of Perinatal Care". In addition, Dr. Cherouy previously served as the Chair of Quality Assurance and Improvement and Credentialing for the Women's Health Care Service of Fletcher Allen Healthcare for 16 years and of the Medical Staff for three years.

10



## Poll Question #1

### 1) What is your profession?

- a) OB Nurse
- b) Neonatal Nurse
- c) OB Physician
- d) FP Physician
- e) Other Physician
- f) Other Clinician (CNM, NP, PA)
- g) Emergency Responder (EMS, ED)
- h) Other

11

## Poll Question #2

### 2) How many patients a year do you treat with preeclampsia?

- a) 1-10
- b) 10-20
- c) 20-50
- d) Greater than 50
- e) N/A

12

## Pre-Test Question #1

**1) What is required for the diagnosis of preeclampsia?**

- a) Edema
- b) Hypertension
- c) Proteinuria
- d) All of the above
- e) Two of the above

13

## Pre-Test Question #2

**2) What is the main cause of maternal mortality related to preeclampsia?**

- a) Complications of a seizure
- b) Organ damage/failure
- c) Pulmonary edema
- d) Cerebral Hemorrhage

14

### Pre-Test Question #3

**3) What is(are) the benefits of treating mild chronic hypertension during pregnancy?**

- a) Decreases fetal growth restriction
- b) Decreases preeclampsia
- c) Decreases Seizures
- d) All of the above
- e) None of the above

15

### Pre-Test Question #4

**4) Persistent (>60 minutes) blood pressure of 165/95 in a term preeclamptic patient:**

- a) Requires careful observation to determine if delivery is required
- b) Should be considered for treatment as an outpatient if the patient is clinically stable
- c) Is an hypertensive emergency and should be treated with anti-hypertensive medication
- d) Should be treated with magnesium sulfate

16

## Hypertensive Disorders in Pregnancy

- Hypertensive disorders in pregnancy (HDP) complicate 5 - 10% of pregnancies in the U.S.
- HDP results in maternal morbidity and mortality, preterm delivery, fetal growth restriction, low birth weight and perinatal death

17

## Hypertensive Disorders in Pregnancy

- NYSDOH 2010 Maternal Mortality Review
  - HDP highest primary cause of maternal death
  - Responsible for 20% of all maternal deaths
  - Increasing prevalence
    - Eight-fold increase in gravidas over 35 years old

*Hypertensive Disorders in Pregnancy*. Guideline Summary. New York State Department of Health, May, 2013.

18

## Hypertensive Disorders in Pregnancy Quality Issues in Care of Patients with HDP

- Approximately half of mortalities associated with HDP have good to strong evidence for preventability
- The majority of the rest identified to have some chance for improvement in outcome

19

## Hypertensive Disorders in Pregnancy Quality Issues in Care of Patients with HDP

- Delays in presenting for care
- Missed or misinterpreted clinical information
- Delays in diagnosis
  - Over half of deaths related to HDP had vital sign evidence or other clinical triggers that were misidentified
- Delays in therapy

*Hypertensive Disorders in Pregnancy*. Guideline Summary. New York State Department of Health, May, 2013.

20

## Hypertensive Disorders in Pregnancy

### What Was Learned

#### The Good

- Excellent prenatal care with close observation for worsening disease and timely intervention can decrease poor outcomes

21

## Hypertensive Disorders in Pregnancy

### What Was Learned

#### The Bad

- Preventable severe morbidity or mortality related to poor clinical application of new knowledge regarding:
  - Dynamic nature of preeclampsia
  - Multi-systemic nature of preeclampsia
  - Possibility of post partum worsening or initial presentation of preeclampsia often outside of obstetric care
- The over-commitment to previously taught rigid diagnostic “triad” criteria for preeclampsia

22

## Hypertensive Disorders in Pregnancy

### What Was Learned

#### Recommended changes:

- ✓ Classification
- Diagnostic criteria
- Screening and prevention
- Management

23

## Definitions and Stratification

Diagnosis	Blood Pressure Measurement	Additional Clinical Manifestations	Weeks at Presentation	Lasting
Chronic (preexisting) hypertension	$\geq 140$ mm Hg systolic or $\geq 90$ mm Hg diastolic or both	None	Before 20 weeks or prior to pregnancy	Beyond 12 weeks postpartum
Gestational Hypertension	$\geq 140$ mm Hg systolic or $\geq 90$ mm Hg diastolic or both	None	At or after 20 weeks without proteinuria or other features of preeclampsia	
Preeclampsia	$\geq 140$ mm Hg systolic or $\geq 90$ mm Hg diastolic or both without other severe features	New onset proteinuria (or other clinical manifestations as listed below under "Severe preeclampsia")	At or after 20 weeks or postpartum period	
Chronic hypertension with superimposed preeclampsia	$\geq 140$ mm Hg systolic or $\geq 90$ mm Hg diastolic or both, previously diagnosed	New or worsening proteinuria (or other clinical manifestations as listed below under "Severe preeclampsia")	Chronic hypertension before 20 weeks or prior to pregnancy, with preeclampsia at or after 20 weeks	Chronic hypertension expected to continue beyond 12 weeks postpartum
Severe preeclampsia	$\geq 160$ mm Hg systolic or $\geq 110$ mm Hg diastolic or both	Cerebral or visual disturbances, epigastric or RUQ pain, maternal end organ complications, abnormal labs or fetal morbidity		
Eclampsia	Preeclampsia (may have <b>NOT</b> been diagnosed)	New onset grand mal seizure in women with preeclampsia	Anytime during pregnancy or the postpartum period (six weeks)	

24

## Hypertensive Disorders in Pregnancy Changes in Diagnosis

### Clinical Findings that Define Severe Disease\*

#### Hepatic

- Greater than two-fold elevation in transaminases
- Epigastric or RUQ pain (without identifiable etiology)

#### Blood

- Platelets  $<100,000/\text{mm}^3$

\*In presence or absence of proteinuria.

25

## Hypertensive Disorders in Pregnancy Changes in Diagnosis

### Clinical Findings that Define Severe Disease\*

#### Renal

- Creatinine  $>1.1 \text{ mg/dl}$  or doubled

#### Respiratory

- Pulmonary edema

#### CNS

- Headaches
- Visual changes
- Seizures

\*In presence or absence of proteinuria.

26

## Hypertensive Disorders in Pregnancy Changes in Classification

- Pregnancy Induced Hypertension (PIH) now called Gestational Hypertension (GHTN)
- The presence and severity of proteinuria eliminated in severe preeclampsia classification
  - Lack of association of degree of proteinuria with outcome

27

## Hypertensive Disorders in Pregnancy Changes in Classification

- Presence of fetal IUGR eliminated from classification criteria
  - IUGR is managed similarly whether preeclampsia is present or not
- The term “mild” preeclampsia is discouraged, instead, the term is “preeclampsia without severe features”

28

## Hypertensive Disorders in Pregnancy

### What Was Learned

#### Recommended changes:

- Classification
- ✓ Diagnostic criteria
- Screening and prevention
- Management

29

## Hypertensive Disorders in Pregnancy

### Changes in Diagnosis

*Proteinuria no longer is required for the diagnosis of preeclampsia in the presence of elevated blood pressure and other systemic dysfunction*

- Mortality reviews have noted a delay in intervention for worsening disease when proteinuria was not present
- Preeclampsia can spare the kidneys until late in the disease process
- Twenty percent of patients with significant disease (e.g., eclampsia) do not have proteinuria

30

## Hypertensive Disorders in Pregnancy Changes in Diagnosis

*Proteinuria* is defined as:

- $\geq 300$  mg protein/24 hours; or
- A protein/creatinine ratio of  $\geq 0.3$  mg/dl in a spot urinary sample
  - The use of qualitative proteinuria assessment with dipsticks is discouraged for diagnostic purposes
  - *Proteinuria no longer is required* for the diagnosis of preeclampsia in the presence of elevated blood pressure and other systemic dysfunction

31

## Hypertensive Disorders in Pregnancy What Was Learned

### Recommended changes:

- Classification
- Diagnostic criteria
- Screening and prevention
- Management

32

## Hypertensive Disorders in Pregnancy Changes in Screening and Preventive care

- Medical and obstetric history is best screening
- No other clinical or laboratory screening method is recommended
- Restriction of dietary salt or activity limitations not recommended for women with chronic HTN or those newly diagnosed gestational hypertension
  - Aerobic exercise is not recommended for women with preeclampsia or gestational hypertension

33

## Hypertensive Disorders in Pregnancy Changes in Screening and Preventive care

- Consider low dose aspirin therapy for women with a history of more than one episode of preeclampsia in prior pregnancies or diagnosis of preeclampsia in a prior pregnancy that led to a premature delivery prior to 34 weeks\*

\* Subject to change based on USPSTF recommendations currently out for review and comment

34

## Hypertensive Disorders in Pregnancy

### Changes in Screening and Preventive care

#### No Evidence for Continued Recommendation:

- Calcium supplementation
- Oral magnesium supplementation
- Home blood pressure monitoring

35

## Hypertensive Disorders in Pregnancy

### What Was Learned

#### Recommended changes:

- Classification
- Diagnostic criteria
- Screening and prevention
- ✓ Management

36

## Hypertensive Disorders in Pregnancy Changes in Management

### Use of Magnesium Sulfate

- Magnesium sulfate is indicated for severe preeclampsia
  - With preeclampsia without severe features, magnesium is not required but may be considered based on clinical presentation and physician judgment
- Intra-operative administration of magnesium sulfate recommended for patients with the diagnosis of preeclampsia to prevent eclampsia
- Magnesium sulfate is recommended for post partum patients with new onset hypertension with CNS findings (headache, visual changes, seizure)

37

Report of the American College of Obstetricians and Gynecologists' Task Force on Hypertension in Pregnancy: Executive Summary. *Obstetrics & Gynecology*. 122(5): 1122-1131, November 2013.



## Hypertensive Disorders in Pregnancy Changes in Management

### Use of Anti-Hypertensive Medications

- $\geq 160$  systolic *OR*  $\geq 110$  diastolic is considered an *hypertensive emergency* in pregnancy
  - This should be confirmed within 15 minutes and therapy initiated in order to decrease blood pressure
- Intravenous labetalol or hydralazine are medications of choice
  - Standardized protocols should be used for treatment, provider notification, fetal and maternal surveillance

38

Emergent Therapy for Acute-Onset, Severe Hypertension With Preeclampsia or Eclampsia. ACOG Committee Opinion 514. December 2011.



## Hypertensive Disorders in Pregnancy Changes in Management

### Mode of Delivery and Type of Analgesia

- Vaginal delivery is preferred
  - Cesarean for standard indications, or considered for severe preterm preeclampsia with unfavorable cervix remote from delivery
- Regional analgesia (epidural, spinal) is preferred

39

## Hypertensive Disorders in Pregnancy Changes in Management

### Timing of Delivery

- Patients with controlled chronic hypertension without maternal or fetal complications should not be delivered before 38 weeks
- Delivery should be considered at 37 weeks gestation for women with preeclampsia

40

## Hypertensive Disorders in Pregnancy

### Highlights of Current Care

- ✓ Risk assessment
- Evaluation and counseling
- Medication management
- Pre-hospital care
- Inpatient care
- Postpartum care

41

## Hypertensive Disorders in Pregnancy

### Assessment

#### Risk Factors for Preeclampsia:

- Multifetal pregnancy
- Elevated pre-pregnancy Body Mass Index
- Nulliparity
- Vascular and connective tissue disease
- Gestation hypertension diagnosed prior to 34 weeks gestation
- Maternal age  $\geq$  40 years

42

## Hypertensive Disorders in Pregnancy Assessment

### High Risk Factors for Preeclampsia:

- Chronic (preexisting) hypertension
- Previous preeclampsia
- Autoimmune disease/antiphospholipid antibodies
- Chronic kidney disease
- Preexisting diabetes mellitus (Type 1 or 2)

43

## Hypertensive Disorders in Pregnancy Highlights of Current Care

- Assessment
- Evaluation and counseling
- Medication management
- Pre-hospital care
- Inpatient care
- Postpartum care

44

## Hypertensive Disorders in Pregnancy Ambulatory Care

### Preconception/Initial Visit Counseling and Evaluation

- Assessment of preexisting end organ injury from pre-existing hypertension
- Discuss treatment strategies
- Medication regimens and alternatives

45

## Hypertensive Disorders in Pregnancy Ambulatory Care

### Diet and Lifestyle

- Restriction of dietary salt for women with gestational or chronic hypertension is not recommended
- Activity limitations not recommended for women with chronic hypertension who are accustomed to exercise and BP is well controlled
- Aerobic activity is not recommended in women with preeclampsia
- Consider restricting aerobic activity in women with gestational hypertension
- Eliminate the use of alcohol, tobacco and illicit drugs

46

## Hypertensive Disorders in Pregnancy

### Consideration for Outpatient Management of BP

- Check blood pressure twice weekly for women with gestational HTN or preeclampsia without severe features
- Moderate evidence supports that antihypertensive therapy is not required for women with gestational HTN or preeclampsia with BP systolic  $\leq 160$ mm Hg or diastolic  $\leq 110$ mm Hg

47

## Hypertensive Disorders in Pregnancy

### Consideration for Outpatient Management of BP

- Outpatient management of women with Preeclampsia <37<sup>0/7</sup> weeks , mild gestational hypertension or preeclampsia and no indication for delivery
    - Daily fetal movement by patient
    - Serial BP measurements (twice weekly)
    - Assessment of platelet counts and liver enzymes (weekly)
    - Fetal antepartum testing and ultrasound assessment as clinically indicated
- <34<sup>0/7</sup> weeks, give corticosteroids - if stable, delay delivery for at least 48 hours

48

## Hypertensive Disorders in Pregnancy

### Consideration for Outpatient Management of BP

- Antihypertensive therapy is recommended for pregnant women with chronic (preexisting) hypertension and no end organ damage when systolic BP  $\geq 160$  mm Hg or diastolic BP  $\geq 105$  mm Hg.
- With end-organ damage or in cases when BP is rising, some providers may choose to begin therapy when BP  $\geq 150/100$ .

49

## Hypertensive Disorders in Pregnancy

### Blood Pressure Measuring Technique

#### Considerations:

- Cuff size
  - Cuff bladder covers 75-100% of the arm circumference
- Degree of stimulation
  - Avoid tobacco/caffeine for 30 minutes
  - Undisturbed and at rest for 5 minutes
- Posture
  - Sitting with feet flat on floor, back supported
- Talking
  - Silence during measurement



50

## Hypertensive Disorders in Pregnancy Highlights of Current Care

- Risk assessment
- Evaluation and counseling
- ✓ Medication management
- Pre-hospital care
- Inpatient care
- Postpartum care

51

## Hypertensive Disorders in Pregnancy Risk Reduction for Preeclampsia and Other Complications

ACOG guidelines suggest that women at high risk for preeclampsia receive low dose Aspirin 81mg/day\*

- Previous pregnancy with preeclampsia delivered prior to 34 weeks gestation
- Preeclampsia in more than one prior pregnancy

52

Report of the American College of Obstetricians and Gynecologists' Task Force on Hypertension in Pregnancy: Executive Summary. *Obstetrics & Gynecology*. 122(5):1122-1131, November 2013.

## Hypertensive Disorders in Pregnancy Risk Reduction for Preeclampsia and Other Complications

Other sources suggest that women at high risk for preeclampsia may benefit from low dose Aspirin 81mg/day\*

- Chronic (preexisting) hypertension
- Gestation hypertension diagnosed prior to 34 weeks gestation
- Autoimmune disease/antiphospholipid antibodies
- Chronic kidney disease
- Preexisting diabetes mellitus (Type 1 or 2)

53 Source: *Hypertensive Disorders in Pregnancy*. Guideline Summary. New York State Department of Health, May, 2013.



## Commonly Used Antihypertensive Agents for Non-Acute Management of Chronic Hypertension in Pregnancy

Agent	Dosage Range	Caution/Comments
<b>Labetalol</b>	<b>Standard dose:</b> 200 – 800 mg orally per day in 2 – 3 divided doses <b>Maximum dosage:</b> 2,400 mg per day	Should be avoided in women with cardiac conduction abnormalities, systolic heart failure or asthma.
<b>Nifedipine (Extended-release)</b>	<b>Standard dose:</b> 30 – 60 mg orally per day <b>Maximum dosage:</b> 120 mg per day	Ensure correct form of nifedipine prescribed; short acting nifedipine is not recommended due to the risk of hypotension. There is a concern for severe hypotension if nifedipine is continued with intravenous magnesium.
<b>Methyldopa</b>	<b>Standard dose:</b> 250 – 1,000 mg orally per day in 2 – 3 divided doses. <b>Maximum dosage:</b> 3,000 mg per day	Associated with hepatitis, hemolytic anemia, depression and sedation.

\*Modified from American Congress of Obstetricians and Gynecologists. *Chronic Hypertension in Pregnancy*. Practice Bulletin Number 125. *Obstetrics and Gynecology* 2012; 119 (2 Part 1): 396-407.

54



## Hypertensive Disorders in Pregnancy

### Highlights of Current Care

- Risk assessment
- Evaluation and counseling
- Medication management
- ✓ Pre-hospital care
- Inpatient care
- Postpartum care

55

## Hypertensive Disorders in Pregnancy

### Pre-Hospital Care and Considerations

- Acute onset of severe hypertension (systolic  $\geq 160$  mm Hg or diastolic  $\geq 110$  mm Hg or both) in pregnant or postpartum women with preeclampsia or eclampsia constitutes a hypertensive emergency.
- Women presenting to an office setting should be rapidly referred to the appropriate hospital setting for treatment.

56

## Hypertensive Disorders in Pregnancy Pre-Hospital Care and Considerations

- Hospital destination protocols and level of EMS provider need to be reviewed for the ability to care for a pregnant or postpartum patient with a hypertensive crisis.

57

## Hypertensive Disorders in Pregnancy Pre-Hospital Care and Considerations Emergency Medical Services

### Magnesium Sulfate Administration by EMS

- 4 grams over 2 minutes IV followed by physician options for additional mag sulfate bolus or infusion
- Individuals experienced in the dosing and risks of magnesium sulfate should be consulted and available

58

## Hypertensive Disorders in Pregnancy Highlights of Current Care

- Risk assessment
- Evaluation and counseling
- Medication management
- Pre-hospital care
- Inpatient care
- Postpartum care

59

## Hypertensive Disorders in Pregnancy Inpatient Prenatal Care

- Recommended for severe hypertension and preeclampsia.
- Severe preeclampsia remote from term is best managed in a tertiary care setting.
- Antenatal steroids should be considered for women at risk for preterm delivery who present between 24 and 34 weeks gestation.

60

## Hypertensive Disorders in Pregnancy

### Inpatient Prenatal Care of Severe Hypertension and Preeclampsia

- Acute onset of severe hypertension (systolic  $\geq 160$  mm Hg or diastolic  $\geq 110$  mm Hg or both) in pregnant or postpartum women with preeclampsia or eclampsia constitutes a hypertensive emergency.
- Consider consultation with Maternal Fetal Medicine and/or critical care subspecialists.
- Prompt recognition and management is necessary to prevent maternal stroke and avoid fetal compromise.

61

## Hypertensive Disorders in Pregnancy

### Eclampsia/HELLP syndrome

#### Severe Manifestations of Preeclampsia

- Eclamptic Seizures first line treatment is Magnesium Sulfate
- Required:
  - Continuous cardiorespiratory monitoring;
  - Assessment and documentation of fluid intake and urine output; and
  - Regular assessment of deep tendon reflexes.

62

## Hypertensive Disorders in Pregnancy

### Eclampsia/HELLP syndrome

#### Magnesium Sulfate Toxicity

- Excreted by kidneys
- Renal insufficiency (serum creatinine > 1.0 g/dL, must decrease dosage (give loading, avoid maintenance))
- Avoid in patients with myasthenia gravis
  - Can cause myasthenic crisis
    - Neuromuscular blockade
    - Hypotension

63

## Hypertensive Disorders in Pregnancy

### Eclampsia/HELLP syndrome

#### Levels of Acute Magnesium Sulfate Toxicity

Serum Magnesium Level (mg/dL)	Symptom
9.6-12.0	Loss of deep tendon reflexes
12.0- 18.0	Respiratory paralysis
24.0-30.0	Cardiac Arrest

- Antidote to Magnesium Sulfate Toxicity  
Calcium gluconate 1 gram IV given over 5-10 minutes

64

## Hypertensive Disorders in Pregnancy

### Eclampsia/HELLP syndrome

#### Severe Manifestations of Preeclampsia

- Consideration for delivery is discussed once maternal stability is achieved.
- Other considerations including transfusion of platelets should be considered and undertaken under the guidance of a Maternal Fetal Medicine or critical care subspecialist.

65

## Hypertensive Disorders in Pregnancy

### Delivery: Intrapartum Management

- Complex decision with multiple considerations including degree of blood pressure control, gestational age, and maternal and fetal well being.
- Preeclampsia is a maternal indication for delivery and should be considered at 37 weeks gestation.
- Delivery may be considered in women >34 weeks with severe preeclampsia or <34 weeks with unstable features.
- Delivery should not be deferred for antenatal steroid administration when severe maternal complications are evident.

66

## Hypertensive Disorders in Pregnancy Inpatient Prenatal Care

- Protocols needed for outpatient management of care and monitoring (once hypertension controlled)
- If the patient is a candidate for outpatient care, provide formal written instructions for her regarding signs/symptoms of postpartum preeclampsia/eclampsia and return for follow-up care

67

## Hypertensive Disorders in Pregnancy Highlights of Current Care

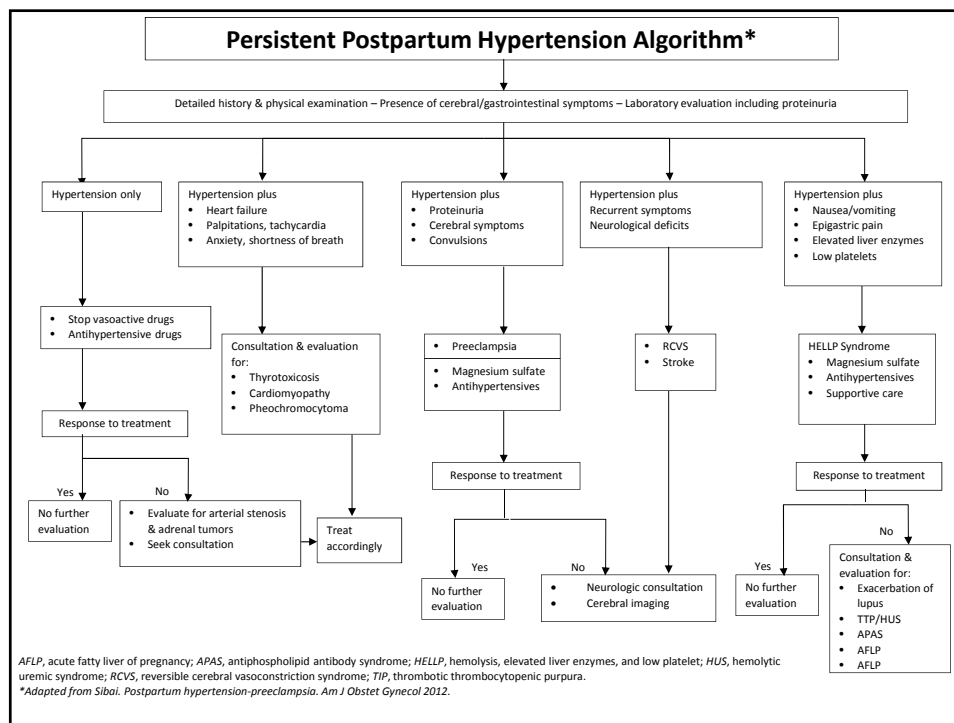
- Risk assessment
- Evaluation and counseling
- Medication management
- Pre-hospital care
- Inpatient care
- Postpartum care

68

## Hypertensive Disorders in Pregnancy Postpartum and Follow-Up

- Magnesium sulfate therapy, once initiated, continues for 24 hours postpartum.
- Postpartum women should not be discharged from the hospital until BP controlled for  $\geq 24$  hours.
- The provider and patient should have a plan to assess BP in the 3-5 day postpartum period.
  - Peak blood pressure can occur 3-5 days after delivery.
  - BP may be unstable for 1 – 2 weeks, or longer.
- NSAIDs may increase blood pressure
  - Consider alternative pain medications

69



## Hypertensive Disorders in Pregnancy Improving Outcomes

Care depends on care team member collaboration and communication to successfully manage and reduce error through:

- Initiatives to standardize care
  - Prompt notification of providers regarding BP elevation and initial elevation
  - Notification and involvement of anesthesia during admission of preeclamptic women
  - Involvement of family and team (obstetric, neonatal and anesthesia) when considering delivery <34 weeks gestation

71

## Hypertensive Disorders in Pregnancy Improving Outcomes

Care depends on care team member collaboration and communication to successfully manage and reduce error through:

- Dissemination of evidence based clinical guidelines
  - General management of preeclampsia
  - Severe hypertension management
  - Indications for seizure prophylaxis in preeclampsia

72

## Hypertensive Disorders in Pregnancy Continuous Quality Improvement Across the Care Spectrum

### Outpatient Practices

- Do you educate and monitor how BPs are measured in your office?
- Do you educate patients about their risk of hypertensive disorders in pregnancy?
- If you had a patient with a hypertensive crisis in your office, would your staff know what to do?

73

## Hypertensive Disorders in Pregnancy Continuous Quality Improvement Across the Care Spectrum

### Emergency Medical Care/Transport Providers

- Is your staff familiar with the protocols to manage severe hypertension in pregnancy?
- Have you done a simulation based scenario on a hypertensive obstetric emergency?

74

## Hypertensive Disorders in Pregnancy Continuous Quality Improvement Across the Care Spectrum

### Emergency Department Care

- Do you have a standard process for evaluating pregnant/postpartum women who present with severe hypertension?
- Have you done a simulation-based scenario on an Obstetric Emergency?

75

## Hypertensive Disorders in Pregnancy Continuous Quality Improvement Across the Care Spectrum

### Hospital-Based Obstetric Care

- Do you have a standard of care/algorithm for the staff to follow in the event of severe hypertension?
- Do you monitor compliance to the Standard of Care (SOC)?
- Have you done a simulation based scenario on a hypertensive crisis?
- Do you educate your postpartum patients about their risk of preeclampsia post discharge?

76

## Hypertensive Disorders in Pregnancy

### Key Messages: Outpatient Providers

**Severe hypertension recognized in an outpatient office is an obstetric emergency and requires immediate evaluation and transfer to an appropriate higher level of care**

- Low-dose aspirin when history of severe early preeclampsia
  - When delivery occurred by 34 weeks
    - Check baseline labs/urine early in pregnancy
- New 3<sup>rd</sup>-trimester HTN, check BPs at least weekly
  - Fetal assessment as appropriate
- Salt restriction and strict bedrest not recommended

77

## Hypertensive Disorders in Pregnancy

### Key Messages: Outpatient Providers

- Antihypertensive therapy is recommended for pregnant women with chronic (preexisting) hypertension and no end organ damage when systolic BP  $\geq 160$  mm Hg or diastolic BP  $\geq 105$  mm Hg.
- With end-organ damage or in cases when BP is rising, some providers may choose to begin therapy when BP  $\geq 150/100$

78

## Hypertensive Disorders in Pregnancy

### Key Messages: Outpatient Providers

#### Delivery Timing

- Suggested delivery at 37 weeks for non-severe preeclampsia or gestational HTN
- For chronic HTN without any maternal or fetal complications, delivery <38 weeks not recommended

79

## Hypertensive Disorders in Pregnancy

### Key Messages: Emergency Medical Service Providers

- Know obstetrical level of care for facilities in your region
- Magnesium sulfate treatment protocol for preeclampsia
  - Magnesium sulfate – 4 grams IV followed by physician option for additional infusion or bolus as needed

80

## Hypertensive Disorders in Pregnancy

### Key Messages: Emergency Department Providers

- Consider preeclampsia when headache or RUQ pain in pregnancy  $\geq 20$  weeks
- Proteinuria and IUGR not criteria for severity
  - Proteinuria not required if other features of severe preeclampsia are present
    - Still required for non-severe preeclampsia
      - $\geq 300$  mg, or spot  $\geq 0.3$ , or dipstick  $\geq +1$
- Severe labs: Liver Enzyme Function Tests 2x normal, creatinine  $>1.1$  mg/dl, or platelets  $<100,000/\text{mm}^3$

81

## Hypertensive Disorders in Pregnancy

### Key Messages: Inpatient Providers

#### Magnesium Sulfate

- Based on low-quality evidence, Task Force on HTN suggests it not be given for non-severe preeclampsia
- Do give for severe preeclampsia
  - Start if severe on admission—can stop if expectant management indicated
  - Keep running during cesarean and generally for 24 hour postpartum

82

## Hypertensive Disorders in Pregnancy

### Key Messages: Inpatient Providers

- Hypertensive emergencies (BP  $\geq$ 160/110) require urgent treatment
  - Antihypertensives
    - First-line: hydralazine (5-10 mg IV) and/or labetalol (20 mg IV with increasing doses per response)
      - Nifedipine also can be used, but give with caution if on magnesium

83

## Hypertensive Disorders in Pregnancy


### Key Messages: Inpatient Providers

- First line for eclampsia: magnesium sulfate 4-6 gram IV over 15 minutes
  - Alternative: lorazepam 2-4 mg IV, diazepam 5-10 mg IV
  - Avoid stat cesarean if maternally unstable
- Postpartum preeclampsia
  - Can occur days-weeks after delivery
  - Magnesium x 24 hours
  - Control BP before discharge

84

**Questions?**

85






**Post-Test Question #1**

**1) What is required for the diagnosis of preeclampsia?**

- a) Edema
- b) Hypertension
- c) Proteinuria
- d) All of the above
- e) Two of the above

86



## Post-Test Question #2

**2) What is the main cause of maternal mortality related to preeclampsia?**

- a) Complications of a seizure
- b) Organ damage/failure
- c) Pulmonary edema
- d) Cerebral Hemorrhage

87

## Post-Test Question #3

**3) What is(are) the benefits of treating mild chronic hypertension during pregnancy?**

- a) Decreases fetal growth restriction
- b) Decreases preeclampsia
- c) Decreases Seizures
- d) All of the above
- e) None of the above

88

## Post-Test Question #4

**4) Persistent (>60 minutes) blood pressure of 165/95 in a term preeclamptic patient:**

- a) Requires careful observation to determine if delivery is required
- b) Should be considered for treatment as an outpatient if the patient is clinically stable
- c) Is an hypertensive emergency and should be treated with anti-hypertensive medication
- d) Should be treated with magnesium sulfate

89

## Contact

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90

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