Banner Health

Clinical Practice Title: Evaluation and Treatment of Hypertension Disorders during pregnancy and post-partum (Adult and Pediatric)	
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Brief Description of Clinical Practice
All pregnant and postpartum females (up to 6 weeks) will be evaluated for hypertensive disorders and treated based on the diagnosis and classification of hypertension.

Reviewed History			
Reviewed by (name/group):	**Original Date:**	**Revision Date:**	**Review Date:**
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Primary Care CCG	August 13, 2015	August 1, 2019	
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Clinical Leadership Team (CLT) Resources		
CLT	Original Approval Date:	Revision Approval Date:
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Toolkit https://bannerhealth.sharepoint.com/sites/Connect/Active-Clinical-Practices/Womens-Health-CCG/WH%20Hypertension%20Disorder%20Toolkit/Forms/AllItems.aspx		

Associated Documents		
Type	**Number**	**Name**
Policy		
Protocol		

Evaluation and Treatment of Hypertension Disorders during pregnancy and post-partum (Adult and Pediatric)

PRACTICE APPROACH:
Expected

PRACTICE STATEMENT:
All pregnant and postpartum females (up to 6 weeks) will be evaluated for hypertensive disorders and treated based on the diagnosis and classification of hypertension.

RATIONALE:
Hypertensive disorders in pregnancy occur in 12-22% of pregnancies and are responsible for approximately 17% of maternal mortality in the United States (CMQCC, 2013). Hypertension in pregnancy is one of the leading causes of maternal and perinatal mortality worldwide. The increase in the incidence of preeclampsia has grown 25% in the U.S. in the past 20 years. For every death that resulted from preeclampsia, there is likely 50-100 more cases that were "near misses" due to less than optimal care or missed diagnoses. Preeclampsia is a significant risk factor for future cardiovascular and metabolic diseases in mothers. (ACOG, 2013)

Introducing standardized guidelines for the identification, treatment, and management of hypertensive disorders of pregnancy has proven effective in reducing adverse maternal outcomes (ACOG, 2015). In a study of over 18,000 women with hypertensive disorders, hypertensive guidelines for assessment, surveillance and treatment were instituted and were noted to show a reduction of almost 40% (3.1% to 1.9%) of combined maternal adverse outcomes of death, eclampsia, stroke, hepatic failure and others. Another study with standardized guidelines had an even more dramatic reduction of greater than 80% (5.1% to 0.7%) for similar adverse maternal outcomes. Standardized guidelines will enhance the identification, treatment and management of hypertension.

CLINICAL APPROACH:
All pregnant and postpartum females (up to 6 weeks) will be evaluated for hypertensive disorders

- All patients should receive BP check at each visit
- If elevated blood pressure, inquire about cerebral or visual disturbances
- If patient has elevated blood pressure, or cerebral or visual disturbances, order UA for evaluation of proteinuria
- If chronic hypertension with concern for superimposed preeclampsia, initial evaluation should occur in a hospital setting
- Once lab results are evaluated, classification will be made using the Hypertensive Disorder in Pregnancy Classification criteria by ACOG

Hypertensive Disorders In Pregnancy Classifications

Chronic Hypertension	- BP >/= 140 mm Hg systolic or >/= 90 mm Hg diastolic predating pregnancy - Identified prior to 20 weeks' gestation - Persists > 12 weeks postpartum - Use of antihypertensive medications before pregnancy
Gestational Hypertension	- BP >/= 140 mm Hg systolic or >/= 90 mm Hg diastolic occurring after 20 weeks gestation - Absence of proteinuria, or other lab abnormalities or symptoms of preeclampsia with severe features. - Transient diagnosis with normalization of BP by 12 weeks postpartum

Hypertensive Disorders In Pregnancy Classifications

Preeclampsia without Severe Features	- BP >/= 140 mm Hg systolic or >/= 90 mm Hg diastolic on two occasions at least 4 hours apart after 20 weeks' gestation in a woman with a previously normal blood pressure - Proteinuria > 300 mg per 24-hour urine collection - Protein/Creatinine ratio > 0.3 mg/dL - +1 proteinuria on urine dipstick - Absence of other lab abnormalities or symptoms of preeclampsia with severe features.
Preeclampsia with Severe Features	**If ANY ONE of the criteria are present:** - BP >/= 160 mm Hg or >/= 110 mm Hg diastolic on two occasions at least 4 hours apart while the patient is on bed rest (unless antihypertensive therapy is initiated before this time) HELLP Syndrome - Thrombocytopenia < 100,000/microliter - Impaired liver function as indicated by abnormally elevated blood concentrations of liver enzymes (twice upper limit of normal concentration), severe persistent right upper quadrant or epigastric pain unresponsive to medication and not accounted for by alternative diagnosis, or both - Progressive renal insufficiency (serum creatinine concentration greater than 1.1 mg/dL or a doubling of the serum creatinine concentration in the absence of other renal disease) - Pulmonary edema - New-onset cerebral or visual disturbances TO NOTE: Massive proteinuria (>5 gm in 24 hours) and IUGR are no longer used to diagnose Severe Preeclampsia
Superimposed preeclampsia or eclampsia on chronic hypertension	**If ANY ONE of the criteria are present:** - New-onset proteinuria in woman with hypertension prior to 20 weeks - Sudden increase in BP - Development of other preeclampsia or severe preeclampsia signs or symptoms - Development of Hemolysis Elevated Liver and Low Platelets (HELLP)
Eclampsia	**If ANY ONE of the criteria are present:** - Presence of new-onset grand mal seizures in a pregnant or postpartum patient not due to other possible causes - idiopathic, hemorrhage, aneurysm, AVM) - New-onset seizures up to 6 weeks postpartum

- If > 37 0/7 weeks' gestation, admit to hospital for delivery

- if > 34 0/7 weeks' gestation and any of the following, admit for delivery
  - Active labor
  - PPROM
  - BPP 6/10 or less that persists
  - Intrauterine Growth Restriction (IUGR) <5%
  - Oligohydramnios (maximum vertical pocket < 2 cm)

Chronic Hypertension

- If patient has hypertension prior to pregnancy, or is diagnosed very early in pregnancy close expectant management can be initiated to assess for worsening hypertension or onset of superimposed pre-eclampsia
- Baseline labs should be obtained for comparison later in pregnancy - LFT's, CBC, Cr, and baseline 24 hour urine protein
- Consider echocardiography for patients with long term chronic hypertension of more than 4 years
- Inquire about cerebral or visual disturbances at each visit
- Daily fetal kick counts after 26 weeks
- Ultrasound for fetal growth after viability is recommended; if IUGR noted (< 10 %ile EFW or if AC < 5th %ile) perform umbilical artery Doppler
- If patient has chronic hypertension requiring medication, or has other underlying medical conditions that affect fetal outcome initiate antenatal testing @32 weeks unless change in clinical situation prior to 32 weeks.
  - AFI weekly
  - NST weekly
  - BPP if NST is non-reactive
- BP check at weekly office visits and BP checks at all fetal monitoring visits
- Check for proteinuria at each visit
- Watch for sudden increases in BP or proteinuria
- If any new-onset of signs of severe preeclampsia, increased LFT's (twice upper limit of normal) or decreased platelets (<100,000), or abnormal Doppler flow study, hospitalize patient for management or delivery
- Patients with uncomplicated chronic hypertension should not be delivered before 38 0/7 weeks' gestation
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Preeclampsia/Gestational Hypertension Continued Evaluation and Expectant Management

  - If < 37 0/7 weeks' gestation and mild gestational hypertension (GHTN) or preeclampsia without severe features, the patient can be managed closely with expectant management and evaluation
- If any new-onset of signs of severe preeclampsia, increased LFT's or decreased platelets < 100,000, hospitalize patient for management or delivery
- Inquire about cerebral or visual disturbancesat each visit
- Daily fetal kick counts
- Ultrasound for fetal growth every 3 weeks, if IUGR noted (< 10th %ile, or if AC< 5th %ile) perform umbilical artery Doppler
- AFI weekly
- NST weekly if GHTN, twice weekly if preeclampsia
- BPP if NST is non-reactive
- BP check at weekly office visits and BP checks at all fetal monitoring visits
- Check for proteinuria at each visit for GHTN. Do not need to check once preeclampsia is diagnosed
- CBC/LFTs/Cr each week

Preeclampsia with Severe Features / Chronic Hypertension with Superimposed Preeclampsia with Severe Features Management

If a patient is found to have severe preeclampsia or chronic hypertension with superimposed severe preeclampsia, the patient should be hospitalized for evaluation and management

- With BP >/= 160/110 (>/= 160/105 if chronic hypertension with Superimposed Severe Preeclampsia) that persists over a 15-minute time frame initiate antihypertensive medications
- If > 34 0/7 or if unstable regardless of gestational age, move to delivery after stabilization, AND CONSIDER LATE STEROIDS IF ELIGIBLE
- If < 34 0/7 weeks and stable, move to a higher level center if your facility does not have critical care and NICU or Special Care Nursery (SCN) capabilities
- If < 34 0/7 weeks administer antenatal steroids
- Do not deliver patient based on amount of proteinuria

- If patient is pre-viable and has severe preeclampsia or HELLP syndrome, expectant management is not recommended and the patient should be delivered
- If <34 0/7 weeks and stable expectant management will be determined by maternal and fetal status:

Maternal Assessment –The following assessment should be done in accordance with the WIS Maternal and Fetal Assessment Guidlines Policy (5849) Vital signs, fluid intake, urine output assessment

- Symptoms of severe preeclampsia should be monitored at least every 8 hours
- Presence of contractions, rupture of membranes, abdominal pain or bleeding should be monitored at least every 8 hours
- Lab testing (CBC, platelets, LFTs, Cr) should be performed daily (may be spaced to every other day if patient is stable and asymptomatic)

Fetal Assessment

- Fetal movement assessment daily
- Continuous fetal monitoring until stable, then consider NST with uterine activity daily
- BPP two times a week
- Serial growth scan every 3-4 weeks and umbilical artery Doppler weekly if growth restriction suspected

Maternal Indications for Delivery

- Recurrent severe hypertension
- Persistent or recurrent cerebral or visual disturbances
- Progressive renal insufficiency (serum creatinine > 1.1 mg/dL or a doubling of concentration in the absence of other renal disease)
- Persistent thrombocytopenia
- Pulmonary edema
- Eclampsia
- Suspected abruption
- Progressive labor or ROM
- HELLP syndrome
- Right upper quadrant pain

Fetal Indications for Delivery

- Gestational age 34 0/7 or more
- Severe fetal growth restriction (<5%)
- Oligohydramnios (maximum vertical pocket < 2 cm, AFI 5cm or less)
- BPP of 4/10 or less on two occasions 6 hours apart
- Reversed end-diastolic flow on umbilical artery Doppler studies
- Recurrent variable or late decelerations during NST
- Fetal death

It is suggested that antenatal steroids should be given and delivery delayed for 48 hours if maternal and fetal conditions remain stable for women with severe preeclampsia and gestational age from viability to 33 6/7 weeks with any of the following:

- PPROM
- Labor
- Thrombocytopenia 100,000/microliter
- Persistently abnormal hepatic enzyme concentrations (twice THAN THE UPPER RANGE OF normal values)
- Fetal growth restriction
- Oligohydramnios
- Reversed end-diastolic flow on umbilical artery Doppler studies
- New-onset renal dysfunction or increasing renal dysfunction
- HELLP syndrome

It is suggested that antenatal steroids should be administered in patients from viability to 33 6/7 weeks' gestation, but delivery NOT delayed after stabilization with any of the following:

- Uncontrollable severe hypertension
- Eclampsia
- Pulmonary edema

- Abruption
- DIC
- Non-reassuring fetal status

Route of delivery should be determined by fetal gestational age, fetal presentation, cervical status and maternal-fetal condition. *Cesarean delivery is not required in all cases.*

Magnesium sulfate should be given to all patients planned for delivery prior to 32 weeks for neuroprotection.

Eclampsia

For a patient undergoing eclamptic seizure

- Maintain airway
- Obtain IV access
- TREAT HYPERTENSIVE EMERGENCY IF PRESENT
- Administer magnesium sulfate loading dose of 6 gm IV over 20 min, then 1-2 g/hr continuous infusionIf patient has another seizure, or is already on Magnesium: Give 2nd Loading Dose of Magnesium Sulfate 2 gm over 5 minutes
- If seizures continue despite second magnesium loading dose, use other anti-seizure medication
- Consider intubation if the patient remains unconscious after seizure, has unrelenting seizures or shows signs of aspiration or hypoxia
- If the seizure resolves maintain magnesium until 24 hours after last seizure or delivery, assess for neurologic injury/function and consider imaging if concerned, and administer FLM steroids if <34 0/7 weeks
- Move to delivery at this time. Emergent delivery is not necessary if maternal and fetal assessments are stable
- Continue Magnesium for 24 hours after delivery. The infusion may continue beyond 24 hours if no signs of improvement are noted in the patient

Postpartum Preeclampsia

Postpartum management of patients that have delivered with hypertensive disorders is needed to insure stability and observe for worsening status. Continued surveillance and education are needed because some cases of preeclampsia are not diagnosed until the patient is discharged home, sometimes as far as 6 weeks from delivery.

- Monitor BP at least 72 hours after delivery, may require outpatient evaluation
- Monitor BP again in 7-10 days after delivery in outpatient setting
- BP meds should be given if BP is >/= 150 mm Hg systolic or >/= 100 mm Hg diastolic on 2 occasions at least 4-6 hours apart
- BP meds should be given within one hour if BP of >/= 160 mm Hg systolic or >/= 110 mm Hg diastolic and persists over a 15-minute time frame
- Magnesium sulfate should be given if diagnosed in the postpartum period for at least 24 hours after diagnosis. If Magnesium sulfate has been previously discontinued and there is a recurrence of severe hypertension, then Magnesium sulfate should be rebolused at 6 gm and maintained at 2g/hr for 24 hours.
- Educate mothers on signs and symptoms of preeclampsia in order to assess when at home and seek medical attention if needed

Medications

Chronic Hypertension

- BP's of ≥160mm Hg Systolic or ≥105mm Hg Diastolic should be treated with medication
- Medications preferred include labetalol, nifedipine and methyldopa
- For women with chronic hypertension administration of low-dose daily aspirin beginning in the late first trimester is suggested (>/=13wk0d)
- If already on antihypertensive medications, the option to discontinue during the first trimester and reinitiate with increase in BP is acceptable, otherwise can maintain current medications if safe for pregnancy

Preeclampsia

- If BP remains < 160/110 (<160/105 for chronic hypertension with superimposed preeclampsia), no antihypertensive medication is needed
- Magnesium is not uniformly REQUIRED in these patients unless they convert to severe status
- Antenatal steroids are recommended between viability and 33 6/7 weeks' gestation

Preeclampsia WITH SEVERE FEATURES / Chronic Hypertension with Superimposed Severe Preeclampsia

- Magnesium sulfate should be administered upon diagnosis of severe preeclampsia/eclampsia
  - Loading dose of 6 gm IV over 20 min, then 2 gm/hr continuous infusion for at least 24 hours. MAINTENANCE DOSE CAN BE MODIFIED FOR RENAL INSUFFICIENCY
- Antenatal steroids should be administered between viability and 33 6/7 weeks, even if delay of delivery for a full course is not an option due to unstable maternal/fetal status
- If BP is > 160/110 (>160/105 for chronic hypertension with superimposed severe preeclampsia) medication is indicated. Attempt to initiate therapy within 30-60 minutes after confirmation of severe range BP
- The goal for BP control is 140-160/90-100. Do not try to lower BP to "normal" range

There will be times that a need to vary from the clinical practice will exist based on individual patient variability and clinical evaluation, documentation in the medical record may be needed to account for this difference.

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KEYWORDS AND KEYWORD PHRASES:

Hypertension
Hypertensive Crisis
Pre-eclampsia