High-risk Obstetrical Clinical Practice Guidelines

Pregnancy-induced Hypertension

<table>
<thead>
<tr>
<th>DEFINITIONS</th>
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<tbody>
<tr>
<td><strong>Pre-eclampsia</strong></td>
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<tr>
<td>› Mild preeclampsia: 140-159/90-109mm Hg, proteinuria 300mg-4999mg/24 hours</td>
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<tr>
<td>› Severe preeclampsia: ≥160/110mm Hg, ≥5000mg/24 hours, oliguria, end-organ symptoms (e.g., headache, visual changes, epigastria pain)</td>
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<tr>
<td><strong>Eclampsia</strong></td>
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<tr>
<td><strong>Hemolytic anemia, ELEVATED LIVER enzymes and Low-platelet count (HELLP Syndrome)</strong></td>
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<tr>
<td><strong>Gestational hypertension</strong></td>
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<tr>
<td>› Mild chronic: 140-179/90-109mm Hg</td>
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<tr>
<td>› Severe chronic: ≥180/110mm Hg</td>
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<tr>
<td><strong>Chronic hypertension</strong></td>
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<tr>
<td><strong>Effects of Hypertension on Pregnancy:</strong></td>
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<tr>
<td><strong>Initial Evaluation in Chronic Hypertension:</strong></td>
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<tr>
<td>› Ophthalmologic exams to rule out ischemic heart disease and retinopathy</td>
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<tr>
<td>› Electrocardiogram testing</td>
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<td>› 24-hour urine samples for protein and creatinine clearance</td>
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<td>› A comprehensive metabolic panel to rule out renal involvement</td>
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<tr>
<td><strong>Medication Management:</strong></td>
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<tr>
<td>› As a rule, patients with mild-chronic hypertension do not require medication; although the majority will be taking one if diagnosed</td>
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</table>
Medication Management Cont.:

prior to pregnancy and should probably continue if one of the two types taken is typically used during pregnancy. Methyldopa is the gold standard during pregnancy because of its limited effects on uteroplacental blood flow. Labetalol, a combined alpha- and beta-blocker, can be used as an alternative. Angiotensin-Converting Enzyme (ACE) inhibitors are contraindicated in pregnancy. Second-line medications for hypertensive control can be in the form of oral hydralazine, calcium channel blockers or possibly Catapres patch.

- Patients diagnosed with severe chronic hypertension require antihypertensives.
- Patients diagnosed with both types of chronic hypertension must be monitored for superimposed pre-eclampsia.

Medication and Other Forms of Hypertension:

- For acute forms of hypertension, especially in labor, Hydralazine is the most widely used antihypertensive (5 – 10mg Intravenous Therapy (IV), push q 20 minutes to a max dose of 40 mg); while Labetalol is equally as effective (10 – 20mg IV, push every 15 minutes to a max single dose of 80 mg and total dose of 220 mg). These medications should be used when Systolic Blood Pressure is ≥180mm Hg or Diastolic Blood Pressure is ≥110mm Hg. Avoid maternal hypotension.
- Although used more often, it is still controversial to use antihypertensives during gestational hypertension.
- Consider Maternal-Fetal Medicine (MFM) or an Intensivist consult if patient continues to be unresponsive to other medications.

Seizure Prophylaxis:

- Magnesium sulfate is the drug of choice for prevention of seizures (4 gram bolus over 20 minutes followed by 2 grams per hour, therapeutic serum levels 4-8mg/dl); continue postpartum for at least 24 hours.
- HELLP, severe pre-eclampsia, severe chronic hypertension and chronic hypertension with imposed preeclampsia need MgSO4 protocol for prophylaxis.
- Mild chronic hypertension, gestational hypertension and mild preeclampsia are decided on a case-to-case basis regarding MgSO4 protocol.

Antepartum Testing:

- Although controversial, most would argue that patients diagnosed
**Medication Management Cont.:**

- With chronic hypertension should receive weekly fetal testing or a twice weekly Nonstress Test (NST) with Amniotic Fluid Index test (AFI) weekly or a Biophysical Profile (BPP) test weekly.
- Every 4 – 6 weeks after 28 – 32 weeks gestation to assess fetal growth. If IUGR is suspected, testing should increase to twice weekly surveillance with IUGR umbilical-artery Dopplers or Doppler flow studies. Weekly NSTs for patients diagnosed with gestational hypertension in good control are not indicated.

**Antenatal Corticosteroids:**

- If delivery seems imminent between 24 – 34 weeks, steroids should be initiated. Delivery should not be delayed for steroids if immediate delivery is necessary. Treatment should consist of either two doses of Betamethasone or four doses of Dexamethasone as a single course.

**Timing for Delivery:**

- Gestational hypertension — delivery after 39 weeks based on stability and favorable Bishop score of the cervix
- Chronic hypertension — delivery at 38 – 39 weeks; Delivery should be prolonged until after 39 weeks if patient is maintaining a reassuring fetal heart rate
- Chronic hypertension with superimposed pre-eclampsia — considered based on gestation; deliver with MgSO4 protocol
- HELLP syndrome — delivery with MgSO4 protocol

**Mild pre-eclampsia:**

- <39 weeks — expectant management with clinical judgment regarding maternal and fetal stability; consider MgSO4 protocol
- 39 weeks — delivery and consider MgSO4 protocol

**Severe pre-eclampsia:**

- <28 weeks — if 24 weeks, give steroids and counsel regarding poor outcome; if maternal-fetal unit is deteriorating, deliver with MgSO4 protocol and transfer to a tertiary care facility
- 28 – 32 weeks — hospitalize for observation, steroids and expectant management if maternal-fetal unit is stable; if unstable, deliver with MgSO4 protocol and consider transfer to a tertiary care facility
- 32-34 weeks — consider aminocentesis; if fetal lungs are mature, deliver with MgSO4 protocol; if immature, give steroids and deliver with MgSO4 protocol
- >34 weeks — deliver with MgSO4 protocol
- Consider MFM consult
**Fluid Control:**
- Monitor input and output closely, consider Foley catheter and fluid restriction
- If unstable or if pulmonary edema, consider MFM or Intensive Care specialist consult

<table>
<thead>
<tr>
<th>LEVEL OF ILLNESS</th>
<th>CRITICAL CRITERIA</th>
<th>TREATMENT</th>
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<tbody>
<tr>
<td>Preeclampsia — Mild</td>
<td>Blood Pressure (BP) of 140/90 mm Hg</td>
<td>&gt;37 Weeks: Deliver with MgSO4 protocol</td>
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<tr>
<td></td>
<td>Proteinuria 300 mg/24 hours</td>
<td>34 – 37 Weeks: Use expectant management with clinical judgment regarding maternal-fetal unit stability</td>
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<td>&lt;34 Weeks: Use expectant management with clinical judgment regarding steroid therapy</td>
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<tr>
<td>Preeclampsia — Severe</td>
<td>BP of 160/110 mm Hg</td>
<td>&gt;34 Weeks: Deliver with MgSO4 protocol</td>
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<td></td>
<td>Proteinuria 5 Gms/24 hours</td>
<td>32 – 34 Weeks: If fetal lungs are mature, deliver with MgSO4 protocol; If fetal lungs are immature, use steroid treatment and deliver with MgSO4 protocol</td>
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<td>Oliguria 500 ml/24 hours</td>
<td>28 – 32 Weeks: Hospitalize for observation; Evaluate use of steroids; Employ expectant management if maternal-fetal unit stable; If the maternal-fetal unit is unstable, deliver with MgSO4 protocol</td>
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<tr>
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<td>Platelets &lt;150 K</td>
<td>&lt;28 Weeks: Counsel regarding poor outcome; If the maternal-fetal unit is deteriorating, deliver with MgSO4 protocol</td>
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<td>Increased Blood Urea Nitrogen, creatinine, liver enzymes</td>
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<td>IUGR/Oligohydramnios</td>
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<td>End-organ symptoms: headache, visual changes, epigastric or right upper quadrant pain</td>
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<tr>
<td>Gestational Hypertension</td>
<td>BP without Proteinuria</td>
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<tr>
<td>HELLP</td>
<td>Hemolysis, elevated liver enzyme, low platelets</td>
<td>Deliver with MgSO4 protocol</td>
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<tr>
<td>MgSO4 Protocol</td>
<td>Guidelines</td>
<td></td>
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<tr>
<td></td>
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<td>Administer IV during labor</td>
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<td>Give during initial evaluation for severe preeclampsia when the plan is to manage conservatively</td>
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<td>Loading dose: 4 Gm (range 2 – 6 Gm) over 20 minutes</td>
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<td>Maintenance dose: 2 – 4 Gm/hour Therapeutic serum levels: 4 – 8 mg/dl Postpartum: continue 24 hours or more until clinical indicators improve</td>
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All member care and related decisions are the sole responsibility of the provider. This information does not dictate or control your clinical decisions regarding the appropriate care of members. The guidelines are subject to state regulations and benefits.

Updated and approved by MAC 12/12
BP Control

Guidelines

- Hydralazine 5 – 10 mg intravenously q 20 – 30 minutes to a maximum of 40 mg
- Labetalol 10 – 20 mg intravenously every 15 minutes to a maximum single dose of 80 mg (total maximum dose 220 mg)

Fluid Control

Guidelines

- Monitor input and output
- Foley catheter
- Pulmonary artery catheter if hemodynamically unstable or if pulmonary edema (with MFM consult)
- MFM consult is appropriate for severe and difficult cases
- \(O_2\) saturation

PREGNANCY - PRETERM DELIVERY (PTD)

Definition:

- Preterm delivery is a delivery that takes place prior to 37 weeks gestation.
- Preterm labor is regular contractions that occur prior to 37 weeks gestation and are associated with changes in the cervix.

Tests to Help Identify Patients at Risk for PTD:

- Although many tests have been proposed, only cervical length by ultrasound and fetal fibrinectin (FFN) have been shown to have benefits. However, their clinical usefulness may rest primarily with the ability to identify women who are least likely to deliver (e.g., negative predictive value) as opposed to predicting those who will deliver before 37 weeks.
- A cervical length at 24 weeks of 3.0 has a very high negative predictive value. A negative FFN between 24 – 34 weeks has an even greater negative predictive value.

Antenatal Testing: for predictability of patients at risk for PTD

- Although many tests have been proposed, only cervical length by ultrasound and FFN have been shown to have benefits. However, their clinical usefulness may rest primarily with the ability to identify women who are least likely to deliver (e.g., negative predictive value), as opposed to predicting those who will deliver before 37 weeks.
- A cervical length at 24 weeks of 3.0 has a very high negative predictive value. A negative FFN between 24 – 34 weeks has an even greater negative predictive value.
- Although not as sensitive, combining the two tests can be part of preventing PTD algorithm.

Algorithm for Preventing PTD:

- If cervical length is >30 mm and/or the FFN is negative, the patient can be reassured that delivery is not imminent and can be managed expectantly as an outpatient. If the cervical length is 15 – 30 mm, the FFN result can be used to further triage these patients. Patients with a negative FFN result can also be managed expectantly and do not require hospitalization. Consider repeating the FFN every two weeks and the ultrasounds monthly for 34 weeks. If the FFN is positive and/or the cervical length is <15 mm, these patients warrant close observation and consideration for additional intervention.
- Tycolytics: Do they work?
Tocolytics have only been proven to prolong gestation for two to seven days, which can provide time for administration of steroids and maternal transport to a facility with a Neonatal Intensive Care Unit (NICU).

The INTotal Health advisory panel highly recommends acute tocolysis for preterm labor.

Consider short-term use of IV MgSO4 for neonatal neurological protection for patients at risk.

**Antenatal Corticosteroids: Use Them**

- The most beneficial intervention for patients in true preterm labor is the administration of corticosteroids between 24 and 34 weeks gestation. Treatment should consist of either two doses of betamethasone or four doses of dexamethasone as a single course.
- The use of corticosteroids will decrease the incidence of intraventricular hemorrhage, necrotizing enterocolitis and neonatal mortality.

**Should we use Antibiotics?**

- Antibiotics do not appear to prolong gestation and should be reserved for Group B Strep prophylaxis for patients in whom delivery is imminent.

**Should we screen for Bacterial Vaginosis (BV) in women at risk for PTD?**

- Pregnant women at risk for PTD may be screened for BV during the first or early second trimester, according to the Centers for Disease Control guidelines, but studies have shown mixed results.

**Progesterone to Reduce Preterm Birth:**

- Any women with a prior PTD should be strongly considered for weekly Intramuscular (IM) injections of 17 alpha-hydroxyprogesterone caproate (17P) starting at 16 – 20 weeks and ending in 36 weeks. IM progesterone shows a significant reduction in all races for preterm birth, low birth weight, intraventricular hemorrhage, necrotizing enterocolitis, NICU admissions and the need for supplemental oxygen therapy; while a four-year follow-up found no adverse health outcomes of the children.
- Although other forms or routines of progesterone have been studied (especially vaginal dosing, which would be easier to accomplish), the results have been mixed with some studies showing improvements while others did not.
- Twin gestation did not show the same benefits as did singleton pregnancies on IM progesterone.
- IM Progesterone may be considered in the future for a woman whose cervix is ≤ 15mm and with a +FFN, but more studies need to be performed.

**GESTATIONAL DIABETES MELLITUS (GDM)**

**Screening:**

- All patients should be screened for GDM, whether by history, risk factors or blood work. It is universally accepted that all patients should be screened with a one-hour glucose challenge test, but a low-risk individual may forego this test if she meets the following criteria:
  - Is younger than 25 years of age
  - Is not a member of an ethnic group with increased risk for development of Type 2 diabetes (e.g., Hispanic, African, Native American, South or East Asian, or Pacific Islander)
  - Has a Body Mass Index (BMI) of ≤25
  - Has no previous history of abnormal glucose tolerance
  - Has no previous history of adverse obstetric outcomes usually associated with GDM
  - Has no known diabetes in first-degree relative

- Screening should take place between 24 – 28 weeks gestation. Earlier screening may be indicated if
there has been a prior GDM, prior macrocosmic infant or prior term stillborn.

- The screening test is a 50 gram, pure-glucose load in 150ml of fluid, one-hour glucose challenge without regard to time elapsed since the last meal. Jelly beans have been better tolerated; however, the sensitivity is much lower (e.g., 40 percent versus 80 – 90 percent).

### Diagnoses:

- A value of ≥130 – 140mg/dl is considered abnormal and requires a three-hour Glucose Tolerance Test (GTT). 130 mg/dl has a sensitivity of 90 percent (those that have GDM are actually recognized) while 140 mg/dl reveals a sensitivity of 80 percent. If a value of ≥200mg/dl, a three-hour GTT is not required. A fasting blood sugar is to be taken, and a diagnosis of GDM is given. If the fasting blood sugar is ≥95 – 105, start glyburide or insulin treatment. If the fasting is ≤95 – 105, start the American Diabetes Association (ADA) diet, an exercise program and nutritional counseling. Finger sticks (e.g., fasting and 2-hour postprandials) should be performed and recorded daily, then should be submitted to the physician weekly. If fastings are consistently >95 – 105 or postpartum are >120, insulin should be started. A three-hour GTT is a 100 gram pure-glucose load in 150ml of fluid after fasting. Two abnormal values out of four blood draws constitute GDM. See Table One for two different criteria to use.

### Table One: Two Diagnostic Criteria for Gestational Diabetes Mellitus

<table>
<thead>
<tr>
<th>Status</th>
<th>Plasma or Serum Glucose Level</th>
<th>Plasma Level</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Carpenter/Coustan Conversion</td>
<td>National Diabetes Data Group Conversion</td>
</tr>
<tr>
<td></td>
<td>mg/dL</td>
<td>mmol/L</td>
</tr>
<tr>
<td>Fasting</td>
<td>95</td>
<td>5.3</td>
</tr>
<tr>
<td>One Hour</td>
<td>180</td>
<td>10.0</td>
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<tr>
<td>Two Hours</td>
<td>155</td>
<td>8.6</td>
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<tr>
<td>Three Hours</td>
<td>140</td>
<td>7.8</td>
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</table>

### Management:

#### Next Steps After GDM Diagnosis

- An ADA diet is prescribed, and nutritional counseling and an exercise program are initiated. Finger sticks (e.g., fasting and two-hour postprandials) should be performed and recorded daily, then should be submitted to the physician weekly.
- If fasting blood sugars are consistently >95 – 105 or postprandial are >120, medical therapy should be initiated. Blood glucose monitoring should include either one- or two-hour postprandial blood sugar monitoring with one-hour values ≤120 and two-hour values ≤120
  - GDM A1 is gestational diabetes controlled with diet
  - GDM A2 is gestational diabetes that is insulin or oral-hypoglycemic controlled

#### Diet Therapy

- The ADA recommends an average of 30kcal/kg/d based on prepregnant body weight for nonobese individuals
- If obese (e.g., prepregnancy BMI >30), calorie restrictions of 30 – 33 percent or greater will improve pregnancy outcomes. However, avoid ketonuria by following weekly urine dip sticks.

#### Antepartum Testing

- GDM A1 good control is treated like any other pregnancy, except kick counts start at 28 weeks and NSTs
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GDM A2 should have monthly ultrasounds and twice weekly NSTs or weekly BPPs and AFIs.

**When and How Should Delivery Occur?**

- Deliver GDM A1 patients in good control, as any other patient without complications.
- Deliver GDM A2 patients at 39 weeks. If delivering before 39 weeks, strongly consider an amniocentesis unless clinically indicated.
- Diet controlled (A1): Perform fetal evaluation per clinical indications; deliver by 40 weeks or sooner if clinically indicated.
- Insulin controlled (A2): A Biophysical Profile (BPP) should be performed one or two times weekly, starting at 32 weeks or sooner if clinically indicated. A sonogram should be performed every three to four weeks for fetal growth. Deliver at 38 to 39 weeks if fetus is mature or sooner if clinically indicated.

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All pregnant women should be screened between 24 and 28 weeks gestation. Earlier screening may be clinically indicated (previous GDM, obesity, macrosomia, term stillbirth). Nonfasting 50 Gm oral glucose load with plasma glucose one hour later. If plasmaglucose level is high:

- If > 130-140 mg/dl, conduct a three-hour Glucose Tolerance Test (GTT) (Fasting /100 Gm).
- If > 200 mg/dl, obtain FBS. Diagnose GDM.
- If FBS > 95-105, start ADA diet and nutritional counseling. Once a week, review patient's record of self-monitored blood glucose that was performed while fasting and 2 hours after each meal.
- If FBS < 95-105, start Glyburide or Insulin treatment.

The goal of Glyburide/Insulin therapy is to maintain Fasting Blood Sugar (FBS) < 95-105 mg/dl and 2 hours postprandial blood sugar < 120 mg/dl. HgbA1c at start of insulin therapy and then q 6-8 weeks.