

GESTATIONAL DIABETES MELLITUS – GLUCOSE TOLERANCE TESTS

Gestational Diabetes describes women with carbohydrate intolerance of variable severity with onset or diagnosed during pregnancy. It is heterogeneous group of women with wide spectrum of metabolic abnormality and varying degree of pregnancy-associated risk.

American Diabetes Association & American College of Obstetrics and Gynecology (ACOG) have issued guidelines & recommendations but differ in their recommendations for screening & diagnosis of gestational diabetes. Marshfield clinic follows recommendations issued ACOG for screening and diagnosis of gestational diabetes (*Refer to Newsletter Volume 36 No 3 for additional information*).

American College of Obstetrics and Gynecology Recommendations state:

All pregnant women should be screened for gestational diabetes mellitus (GDM) – whether by patient history, clinical risk factors, or with a 50-g, one-hour loading test at 24 to 28 weeks of gestation to determine blood glucose levels.

The diagnosis of GDM can be made based on the result of the 100-g, three-hour oral glucose tolerance test. Either the plasma or serum glucose levels established by Carpenter and Coustan or the plasma levels designated by the National Diabetes Data Group are appropriate to use. A positive diagnosis requires that two or more upper thresholds be met or exceeded.

Specimen	Plasma or Serum Glucose Level Carpenter and Coustan Conversion (mg/dL)	Plasma Glucose Level National Diabetes Data Group Conversion (mg/dL)
Fasting	<95	<105
1Hour	<180	<190
2 Hour	<155	<165
3 Hour	<140	<145

Diagnosis of GDM based on one-step screening and diagnosis is not recommended as there is no evidence for clinically significant improvement in maternal or newborn outcome and increased healthcare cost.

TESTS OFFERED FOR GESTATIONAL DIABETES SCREENING &DIAGNOSIS

GESTATIONAL DIABETES SCREEN

Patient Preparation: Patient is not required to fast prior to testing and the test is offered without regard to time of the day and/or time of last meal. Glucola (oral glucose load) will be administered to patient by phlebotomist and must be consumed within a 5 minute interval; sipping of water is permitted. After consuming the glucose load the patient will be directed not to smoke, chew gum, eat and consume caffeine-containing beverages and have minimal activity during the testing phase. Patient will be permitted to drink small sips of water and be allowed to leave the laboratory area during the testing phase. However the patient will be required to remain on clinic or hospital facility grounds. In addition the patient will need to return back to

the laboratory for a blood collection in one hour post administration of glucola, a reminder slip with the appropriate time will be given to the patient by phlebotomist.

Note: The patient will be advised by the phlebotomist that if any adverse symptoms develop (i.e. nausea, headache, dizziness or vomiting) the patient should report immediately back to the laboratory. At that point it will be determined if testing will continue or if medical attention is needed.

If specimen is collected between 75 and 90 minutes after dosing, add comment (Coded comment: GLUCOLA).The test should be cancelled if specimen collection is delayed beyond 90 minutes.

Test: This test includes 50g one hour glucose challenge. For test requirements please consult test manual. Administer 50g of oral glucose load and draw blood 1 hour after glucose challenge. Separate plasma or serum from cells within 60 minutes of venipuncture.

Glucose tolerance drinks available at Marshfield & regional centers.

Orange flavored (Non-Carbonated) Glucose tolerance beverage 50g.
Orange flavored (Non-Carbonated) Glucola, BBG fruit punch 50g, 10oz
Orange flavored (Non-Carbonated) Glucose tolerance beverage 75g
Orange flavored (Non-Carbonated) Glucose tolerance beverage 100g

Interpretation:

Reference Range: <135 mg/dL

The values for plasma & serum screen are based on Carpenter & Coustan established values.

Results ≥ 135 mg/dL should be confirmed with 100g 3hrs Oral Glucose Tolerance Test.

Diagnostic 100-g oral glucose tolerance test should be performed on a separate day on women who exceed the chosen threshold on 50g screening.

ORAL GLUCOSE TOLERANCE TEST 3 HRS, 100g

Patient Preparation: The test should be performed on patients who are otherwise healthy and ambulatory (not hospitalized). Ideally the test should be performed in the morning after at least three days of unrestricted physical activity and diet adequate in carbohydrate intake (at least 150 g daily carbohydrate). The patient should fast for a minimum of 8 hours not exceeding 12 hours before the test. **Water is permitted during this fasting period.** Patients should also be advised to discontinue, whenever possible, all nonessential medication that can affect glucose metabolism at least three days before testing.

Glucola (oral glucose load) will be administered to patient by phlebotomist and must be consumed within a 5 minute interval; sipping of water is permitted. After consuming the glucose load the patient will be directed not to smoke, chew gum, eat and consume caffeine-containing beverages and have minimal activity during the testing phase. Patient will be

permitted to drink small sips of water and allowed to leave the laboratory area during the testing phase. However the patient will be required to remain on clinic or hospital facility grounds. In addition the patient will need to return back to the laboratory for multiple blood collections at one, two and three hour post administration of glucola, a reminder slip with the appropriate times will be given to the patient by phlebotomist.

Note: The patient will be advised by the phlebotomist that if any adverse symptoms develop (i.e. nausea, headache, dizziness or vomiting) the patient should report immediately back to the laboratory. At that point it will be determined if testing will continue or if medical attention is needed.

Test: The test includes 100g, 3 hours glucose challenge. Draw a fasting blood sample before administering glucose load dose. Administer 100g oral glucose load dose and draw blood after 1, 2 and 3 hours.

Interpretation

Reference Range:

Fasting: <95 mg/dL.

1 Hour: <180 mg/dL.

2 Hour: <155 mg/dL.

3 Hour: <140 mg/dL.

Positive diagnosis on the plasma or serum glucose levels are based on established values by Carpenter and Coustan. A positive diagnosis requires that two or more upper thresholds be met or exceeded.

References:

- The American College of Obstetricians and Gynecologists, "Screening and Diagnosis of Gestational Diabetes Mellitus," *Obstet & Gynecol*, 2011, 118(3):751-3.
- The American College of Obstetricians and Gynecologists, "Gestational Diabetes," *Obstet. Gynecol*, 2001, 98(3):525-38.
- Perspective on the Proposed Gestational Diabetes Mellitus Diagnostic Criteria, *Obstet & Gynecol*, 2013, 121(1): 177-182.
- The Diagnostic criteria for Gestational Diabetes: To Change or not to Change, *Am J Obstet & Gynecol*, 2012, 10: 887.
- Gestational Diabetes Mellitus, *Obstet & Gynaecol*, 2011, 118(6): 1379-1393.

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