



TECHNICAL PROCEDURE

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| TITLE: GLUCOSE CHALLENGE AND TOLERANCE TESTING | | | | | | |
| PROCEDURE NUMBER: SC070.5 | | | | | | |
| PERFORMING SITE(S) | <input checked="" type="checkbox"/> System Wide | <input type="checkbox"/> UCMC | <input type="checkbox"/> WCH | <input type="checkbox"/> TDC | <input type="checkbox"/> OUTREACH | <input type="checkbox"/> Pathology |
| SITE EFFECTIVE DATE: 12/5/2014 | | SUPERSEDES: 9/29/2014 | | RETIRED DATE: | | |
| WRITTEN/REVISED BY: Angela Heinz, MLS (ASCP) | | | | | | |
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| REVISION HISTORY | | |
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| VERSION | DATE | SUMMARY OF CHANGES |
| SC070.1 | 7/01/2010 | Addition of UC Health logo. Removed references to non UC Health laboratories. Associate review not required. |
| SC070.2 | 11/1/2012 | Changed to UC Health Lab logo. Associate review not required. |
| SC070.3 | 5/20/2013 | Modified section V for draw time requirements and fasting requirements |
| SC070.4 | 9/29/2013 | Clarified fasting blood glucose testing for GTT |
| SC070.5 | 12/5/2014 | Changed FBG notification to >125 per DAPP guidelines. |
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I. Purpose:

Glucose Tolerance (GTT): Glucose tolerance testing is performed as an aid in the diagnosis of diabetes mellitus.

Glucose Challenge: Glucose challenge testing is used as a screening test.

2-Hour Post Prandial: Glucose test can be used to screen patients for diabetes including gestational diabetes.

II. Materials:

1. Glucose tolerance drinks - 10 oz. Bottles (Challenge and GTT)
 - a. 50 gram dose
 - b. 75 gram dose
 - c. 100 gram dose
2. Blood collection supplies
3. Clock or timer

III. Patient Preparation for Glucose Tolerance Testing:

Note: Fasting is NOT required for the 1 hour Glucose Challenge

1. It is recommended that the patient eat a normal, balanced meal at least 3 days prior to the test.
2. Fast 12 hours prior to the beginning of the test.
3. Patient is encouraged to drink water.
4. Patient should NOT drink unsweetened tea, coffee, or any other beverage during fasting or during the procedure.
5. Patient should NOT smoke, chew tobacco, or chew gum (including sugarless gum) during the fasting time or during the procedure. (Note: If patient is chewing gum prior or during the procedure, note this on the requisition form since gum may interfere in the test results.)

Test Dose (Load) for Challenges and Glucose Tolerance Test:

The chart below indicates the correct glucose (load) dose for all tests and patient types.

| Patient | Glucose Tolerance Test Standard test is 2 hours. (A 3,4,5 or 6 hour tolerance test can be performed if requested.) | 1 Hour Challenge | 2 Hour Challenge |
|---------------------------|---|---------------------|---------------------|
| Adult (non - pregnant) | 75 grams dose drink | N/A | 75 grams |
| Adult (pregnant) | 100 grams dose drink | 50 grams | 100 grams |

| Patient | Glucose Tolerance Test Standard test is 2 hours. (A 3,4,5 or 6 hour tolerance test can be performed if requested.) | 1 Hour Challenge | 2 Hour Challenge |
|-------------------------|--|------------------|------------------|
| Child (up to 94 pounds) | 1.75 grams glucose per KG of body weight. If the child is greater than 94 pounds, use 75 gram dose. | N/A | N/A |

Chill beverage prior to ingestion

IV. Procedure for Glucose Tolerance Testing:

1. Verify that the patient has been fasting for 12 hours prior to the test
2. Collect fasting blood specimen
 - Fasting value can be sent to Core Lab as part of the panel or by dosing the Glucometer from the Fasting Blood Glucose (FBG) venipuncture specimen.
 - i. If glucometer value is 40-125 mg/dL: proceed with dosing and send FBG testing to lab once all time points are collected.
 - ii. If glucometer value is abnormal (> 125 mg/dL) contact physician office for guidance. If physician wants GTT order canceled, cancel with comment: FBG result >125 mg/dL cancelled per (Physicians name).
 - iii. If physician requests to continue with GTT document with non-reportable comment "Testing performed per (Physicians name)".
 - If fingerstick glucose was obtained during the patient's office visit, cancel the fasting glucose timepoint by indicating that fasting value was obtained in physician office.
3. Administer test dose. The patient should drink the test dose within 5 minutes.
4. Timing for blood collections should begin at the COMPLETION of ingestion of glucose tolerance beverage.
5. Times for Specimen Collection:

Non-Pregnant Adults and Children:

Standard 2-hour glucose tolerance test

- a. Fasting
- b. ½ hour after ingestion
- c. 1 hour after ingestion
- d. 2 hours after ingestion

3, 4, 5, and 6-hour specimens will be collected if the physician has requested a longer glucose tolerance. A urine sample may also be collected with each blood draw at the request of the physician.

Pregnant Women:**Standard 2-hour glucose tolerance test**

- a. Fasting
- b. 1 hour after ingestion
- c. 2 hours after ingestion

3, 4, 5, and 6-hour specimens will be collected if the physician has requested a longer glucose tolerance. A urine sample may also be collected with each blood draw at the request of the physician.

1 Hour Glucose Challenge

Collect one specimen at 1 hour after ingestion

2 Hour Glucose Challenge

Collect one specimen 2 hours after ingestion

Procedure for 2 Hour Post Prandial Glucose Testing (Pregnant and Non-Pregnant)

1. Glucose levels in serum specimens drawn 2 hours after a meal are rarely elevated in normal patients. In contrast, diabetic patients usually have increased values 2 hours after a meal.
2. Patient should be placed on a high-carbohydrate diet 2-3 days before the test.
3. The day of the test, the patient should eat a breakfast of orange juice, cereal with sugar, toast and milk to provide an approximate equivalent of 100g glucose.
4. A blood specimen is collected 2 hours after the patient finishes eating breakfast.
5. Order appropriate test
6. Label with appropriate label taking care when matching to appropriate time of collection.
7. Send specimens to lab for testing. For Glucose Tolerances, send all of the patient's specimens to the lab at the same time.

V. Procedural Notes:

1. Fasting specimen must be collected prior to ingestion of glucose tolerance beverage. Fasting is not required for glucose challenge testing.
2. Water intake is encouraged throughout the procedure.
3. Discontinue collection of specimens if patient vomits.
4. Patient should be ambulatory.
5. Medications known to affect the GTT (oral contraceptives, salicylates, nicotinic acid, diuretics, caffeine, and hypoglycemic agents) should be discontinued if possible.
6. The preferred draw time of required specimens is in the morning.
 - a. UCP patients: Testing should begin prior to 9am. Variations from this start time require permission from the ordering physician and documentation within Horizon of the approval.
 - b. Non UCP patient: If drawing of specimen(s) is to be performed in the afternoon and the patient is an outpatient, coordinate the timing of the specimen draws so that it occurs within normal operating hours of the draw site.

VI. References:

1. Phlebotomy Handbook, Blood Collection Essentials, Garza & Becan-McBride 7th edition, 2005
2. DAPP Protocol, June 13 2011