

OREGON HEALTH & SCIENCE UNIVERSITY  
Hospitals and Clinics  
Point of Care

**Glucose, Whole Blood  
by LifeScan OneTouch Ultra 2 Personal Glucometer**

Principle

Glucose in the blood sample mixes with special chemicals in the test strip and a small electric current is produced. The strength of the current change corresponds with the amount of glucose in the blood sample. Your meter measures the current, calculates your blood glucose level, displays the result, and stores it in its memory.

Specimen Requirements

1. Fresh whole blood-capillary, from a finger stick. Perform test immediately

Interferences

1. Dehydration may produce a falsely low blood glucose result.
2. Hematocrits greater than 55% or less than 30% may cause false results.
3. Too much blood applied to the test strip may cause falsely high results. If the entire white pad is saturated with blood, repeat the test with a new test strip and a smaller drop of blood.
4. Too little blood applied to the test strip may cause falsely low results. If the confirmation dot on the back of the test strip is not completely blue, repeat the test with a new test strip and a larger drop of blood.
5. Do not reapply blood to the test strip by either adding a second drop of blood or touching the test strip to the puncture site after removing it. The meter will not accurately read glucose results when blood is reapplied to the test strip.
6. Lipemic samples, less than 3000 mg/dL triglycerides, have no significant effect on glucose results.
7. Ascorbic acid less than 3 mg/dL, and acetaminophen and dopamine at therapeutic ranges have no significant effect on glucose results.
8. The following drugs were determined to interfere with blood glucose measurements:
  - a. L-Dopa, >20 mg/dL
  - b. Dopamine, >6 mg/dL
  - c. Gentisic Acid, >10 mg/dL
  - d. Mannitol, >5000 ug/mL

## Reference Ranges

1. Fasting pediatric /adult whole blood glucose levels range from 60 - 99 mg/dL.
2. Fasting range from 0-1 day is 40-60 mg/dl.

## Analytical Measurement Range (Linearity)

Adult	20 – 600 mg/dL
Pediatric	20 – 600 mg/dL

Results above 600 mg/dL will read as **HI**

Result below 20 mg/dL will read as **LO**

## Alert Values

Critical alert values are those results demonstrating such variance from normal as to represent a pathophysiological state with potential of being life threatening unless action is taken quickly. These results must be immediately reported to the care provider and be documented in the test record as to who was contacted, the time of contact, the person making contact, and if relevant, that the results were read back.

Adult	$\leq 50$ mg/dL or $\geq 500$ mg/dL
Pediatric	$\leq 50$ mg/dL or $\geq 500$ mg/dL

## Test Procedure

1. Perform a control solution test once/day and record on the QC log
  - a) Start with the meter off. Check the code on the test strip vial before inserting the strip. Code numbers are used to calibrate your meter with the test strips you are using.
  - b) Insert a test strip to turn on the meter. Make sure the 3 contact bars are facing you. Push the strip in as far as it will go.
  - c) Match the code on the meter with the code on the test strip vial. If the code does not match, press the up or down buttons to match the code numbers.
  - d) Shake the control solution vial before each test. Squeeze the vial to discard the 1<sup>st</sup> drop. Wipe the tip with a clean cloth. Hold the vial upside down and gently squeeze a hanging drop. Touch the solution to the narrow channel in the top edge of the test strip. Make sure the confirmation window fills completely. Control solution should not be applied to the flat face of the test strip.
  - e) When the meter detects control solution in the test strip, it begins to count down from 5 to 1. Your result will appear on the display, along with the date, time, and unit of measure
  - f) Compare the result displayed on the meter to the control solution range printed on the test strip vial.

- g) Document the result on the QC log sheet.
2. To run a patient glucose test start with the meter off.
- a) Check the code on the test strip vial before inserting the strip. Make sure the 3 contact bars are facing you. Push the strip in as far as it will go. This will turn the meter on. If the code on the meter does not match the code on the vial, press the up or down buttons to change the code until it matches.
  - b) The meter is ready for testing when the 'APPLY BLOOD' screen appears.
  - c) Perform the fingerstick. Wipe off the first drop of blood. Touch and hold the second drop of blood to the narrow channel in the top edge of the test strip. Blood will be drawn into the strip. Keep holding the drop of blood to the top edge of the strip until the confirmation window is full. The meter will begin to count down from 5 to 1. The results will appear on the display along with the unit of measure, and the date/time of the test.
  - d) TECHNIQUE NOTES
    - 1. Do not smear or scrape the drop of blood with the test strip.
    - 2. Do not press the test strip too firmly against your puncture site.
    - 3. Do not apply more blood to the test strip after you have removed the drop of blood away.
    - 4. Do not move the test strip in the meter during a test.
    - 5. For the most accurate results, try to test as close to room temperature (68<sup>0</sup>-77<sup>0</sup>F) as you can. Testing must be done within the operating temperature range (43<sup>0</sup>-111<sup>0</sup>F). If you test at the low end of the operating range (43<sup>0</sup>F) and your glucose is high (> 180 mg/dl), the reading on your meter may be lower than your actual glucose.
  - e. After use or prior to the next patient, clean the outside of the meter.
    - 1. Gloves are to be changed and hand hygiene performed between patients.
    - 2. Clean meter surface when visible blood or bloody fluids are present by wiping with a disposable disinfectant wipe (e.g. PDI Sani-Cloth AF or PDI Sani-Cloth HB) to remove any visible organic material. Cleaning should be followed by disinfection (see #3).
    - 3. When no visible organic material is present, after each use disinfect the exterior surface following manufacturer's directions using a disposable bleach wipe (e.g. Clorox Germicidal Wipe or PDI Bleach Wipes).
    - 4. Ensure that the device remains "wet" for the duration of the contact time listed on the label of the bleach wipe.

### Results Reporting

- 1. Record all patient results in mg/dL in the patient's chart and log.
- 2. Report all critical results to provider. Document in patient's chart who was phoned and read back results.

## Reagents

1. Test Strips
  - a. Unopened vials are stable at room temperature (18°-30°C) until the expiration date on the vial.
  - b. Opened vials are stable at room temperature (18°-30°C) for 4 months. **Note: Write the date opened on the vial.**
  - c. Do not refrigerate or freeze test strips.
  - d. Do not expose to heat, moisture, or direct sunlight.
  
2. Control Solutions
  - a. Unopened vials are stable at room temperature (18°-30°C) until the expiration date on the vial.
  - b. Opened vials are stable at room temperature (18°-30°C) for 4 months. **Note: Write the date opened on the vial.**
  - c. Do not refrigerate or freeze control solution.
  - d. Gently shake vial before testing.

## References

1. OneTouch Ultra 2 Owner's Booklet.
  
2. Tietz, Norbert, Ph.D. Fundamentals of Clinical Chemistry. Philadelphia, WB Saunders Company, 2001.

