



STONEY HEALTH SERVICES POLICY AND PROCEDURE

BLOOD GLUCOSE TESTING AND QUALITY CONTROL

Effective: Feb. 26, 2015	Code: PP + Title	Applies To:	<input checked="" type="checkbox"/> Programs and Services
Review: January 18, 2019	Sheet: 1 of 9		<input type="checkbox"/> Client, Family and Community
Next Revision: January 18, 2022	Approval: A. Khan, E.D.		

Related Policies and Procedures:

1. **STANDARD:** SHS personnel ensure client safety at point of care through standardized practice, quality control, quality assurance, ongoing education and proficiency testing for analyzing blood glucose using the Abbott “Freestyle Insulinx” Blood Glucose Monitoring System.
2. **RATIONALE:** Stoney Health Service’s philosophy of Holistic Health Care which encompasses the monitoring of client specific parameters which includes blood glucose monitoring for the purposes of client specific health management and for randomized screening. The Abbott “Freestyle Insulinx” glucose monitoring system is intended for quantitative measurement of glucose in fresh capillary whole blood samples.
3. **POLICY:** The Abbott “Freestyle Insulinx” glucose monitoring system is to be used by properly trained and authorized SHS personnel as an aid in monitoring blood glucose for the evaluation of effective diabetes control and for random screening in a community setting.
4. **PROCEDURE(S):** The procedures cover in this policy include:
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 - B. Alternate Site Testing, p.2
 - C. Performing a Control Solution Test, p.2
 - D. Quality Control for Routine Capillary Blood Glucose Monitoring, p.2
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Related Policies and Procedures:

A. ACCESS TO GLUCOMETERS: Glucometers will be given out from the SHS Diabetes Program and entered into the data base once they have been initially set up

B. ALTERNATE SITE TESTING: Alternate site testing is not to be carried out by SHS personnel.

C. QUALITY CONTROL FOR ROUTINE CAPILLARY BLOOD GLUCOSE MONITORING:

1. Frequency of Control Testing: All designated SHS staff using a glucometer for the purpose of capillary blood glucose monitoring shall ensure quality control by performing a monthly test of their glucometer by performing a control test using both High and Low glucose control solutions at times indicated as below:

- i. Once monthly as per protocol
- ii. Whenever batteries are replaced in the glucometer
- iii. If there is a possibility of damage to the device
- iv. When there is a concern about the blood glucose results/strips/meter

2. Ensuring Accuracy of Blood Glucose Meter Readings: In order to ensure accuracy of Blood Glucose meter readings, meter results should be compared with laboratory measurement of simultaneous venous FPG (8-hour fast) at least annually and when A1C does not match glucose meter readings. **NOTE:** *If the glucometer does not meet the Pass Requirement following a double check, client testing cannot be performed. The glucometer is removed from service and replaced.*

3. Documentation of Control Test Results: Test Results are documented in designated folders located in the Clinic, Well Baby Clinic, Home Care Office, and Diabetes Program Office. These folders outline the procedure and contain a copy of the "Glucometer Monthly Control Solution Check List". These Check Lists will be submitted to the Diabetes Nurse at the end of every month for evaluation. The "Glucometer Monthly Control Solution Check List" as follows.

D. ROUTINE CAPILLARY BLOOD GLUCOSE MONITORING: All designated SHS staff performing routine blood glucose monitoring shall perform capillary blood glucose testing following the appropriate protocol and procedure as per the manufacturer's guidelines. Copies of the manufacturer's guidelines are located in the sleeve of the folders that contain the Glucometer Weekly Control Solution Check List.

E. REAGENTS (TEST STRIPS) STORAGE AND HANDLING

1. **Read** manufacturer's package insert.
2. **Store** strips must be away from direct sunlight and heat; and, at room temperature (4°- 30°C).
3. **Do not use** test strip if it is wet, bent, scratched or damaged.
4. **Use test strip immediately** after inserting into glucometer.
5. **Do not return test strip** to container if it has not been used.
6. **Close the strip container** as soon as one strip has been selected.



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F. RESPONSIBILITIES OF THE WELLNESS COORDINATOR: The responsibilities of the Diabetes Educator in the use and management of glucose meters are to:

1. **Supervise** and support staff in process of testing. All new staff will be oriented to the Policy related to blood glucose monitoring and the use of the equipment.
2. **Maintain** Quality Assurance (QA) Records in the Diabetes Program Office and report results quarterly basis to Management.
3. **Review** QA activities and requirements to ensure staff compliance and awareness and that devices being utilized/functioning within the standardized framework.
4. **Maintain** Operator and Glucometer maintenance records as follows: 1. Glucometer Monthly Control Solutions Tests and 2. Yearly Lab/Meter Comparison Reports. Each glucometer in SHS has been designated to an individual and/or program to allow for tracking.

G. PERFORMING A CONTROL SOLUTION TEST:

1. **Read** Manufacturer's package insert.
2. **Use** only control solution specified in the test strip package insert.
3. **Control** solutions must be stored at room temperature to a maximum of 30° C.
4. **Wash** hands.
5. **Using** an Alcohol Prep swab, clean the surface of the area that will be used for the drop of control solution. The lid of the solution bottle works well. Ensure surface has completely dried before proceeding.
6. **Clean** the Test Strip Port of the Glucometer using an Alcohol Prep swab and allow drying. Do not allow liquids to run up into the glucometer. **NOTE:** Wring out excess moisture from alcohol swab to prevent liquids from entering the meter and causing it to fail.
7. **Place** the meter on a flat surface and turn on the meter by either inserting a test strip or pushing the yellow "Home" button on the front of the meter.
8. **Check** for expiration date on the bottle of strips and make sure the lid is secure once a strip has been selected. Please note that the Normal Range for glucose is located on the side of the strip container. Both High- and Low-Test results should be above and below this range respectively.
9. **Select** the Cog icon on the top left corner of the meter screen. This will allow you to indicate that this is a control Solution Test.
10. **Scroll down** through the options and select "Perform Control Solution Test".



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11. **Check** for Expiration dates on both the High and Low Solutions. Control solutions are stable for 90 days after opening. Write the date opened on the bottle label.
12. **Invert** the control solution bottle three to four times to ensure thorough mixing before use.
13. **Discard** the first drop onto a clean gauze or tissue.
14. **Put** a drop of the “Low” solution on the cleaned lid of the solution bottle. The acceptable range for results is located on the Test Strip container.
15. **Place** a Glucose Test Strip into the glucometer, if not already done. ***NB:** Always seal the Test Strip bottle after removing the Test Strip.*
16. **Bring** the test solution drop over to the strip and allow the entire target area to fill with the sample. The glucometer will beep when there is sufficient sample.
17. **Secure** the lid of the control solution once the test is completed.
18. **Repeat** procedure using the “High” control solution.
19. **Record** the Control Solution Tests are recorded as a check mark in the Log Book of the glucometer. Document outcome on the QA form with the Date, a Pass or Fail and a Signature following the completion of the test. Add comments in comments column if there is a specific reason for the test being done, i.e. the battery has been replaced or there is a concern regarding blood glucose findings. See Appendix I: Glucometer Weekly Control Solution Check List.
20. **Collect** documented Test Forms for the Diabetes Program on a monthly basis.

H. PERFORMING A CLIENT BLOOD GLUCOSE TEST USING A CAPILLARY BLOOD SAMPLE:

1. **Place** the meter on a flat surface.
2. **Put** on gloves.
3. **Clean** the Test Strip Port of the Glucometer using an Alcohol Prep swab and allow drying. Do not allow liquids to run up into the glucometer. ***NB:** Wring out excess moisture from alcohol swab to prevent liquids from entering the meter and causing it to fail.*
4. **Turn** on the meter by either inserting a test strip or pushing the yellow “Home” button on the front of the meter. Check for expiration date of test strips.
5. **Make** sure that the sampling site is clean and dry before lancing.
6. **Collect** the capillary blood sample using a disposable lancing device by Finger Puncture. ***NB:** The sample volume required is 0.3 microlitres.*



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- 7. Apply** a drop of blood to the target area at the end of the test strip. Allow the entire target area to fill with blood. Do not disturb the test strip once the sample has been applied to the test strip. The meter will beep when a sufficient sample has been retrieved by the test strip.

Note: Countdown for the "Insulinx" meter is 5 seconds. The meter allows for additional blood to be applied to the same test surface for up to 60 seconds following initial application. Make sure puncture site is bleeding well. Do not milk the finger for extra blood as this will dilute out the sample with plasma.

- 8. If another puncture is required** to obtain sufficient sample, use a new lancing device to perform another puncture. The setting on the depth of puncture may need to be increased if the samples are of insufficient quantity from the client. Depth control is only available on client specific lancing devices, not the single use lancets.

- 9. Once the meter has indicated** the capillary blood glucose sample reading, the icon to the left of the number can be chosen so that additional data can be entered, i.e. Pre or Post Prandial.

- 10. If results are out of measuring range**, repeat the test with a new test strip to confirm the results. If a second test is out of measuring range, notify the appropriate manager.

I. PERFORMING AN ANNUAL LAB/METER COMPARISON: A Lab/Meter Comparison test to measure the accuracy of the glucometer should be done at least once a year and/or whenever beginning to use a new meter according to the procedural recommendations indicated below. (See Also Appendices II and III)

- 1. The results should be** within a 20% variance of the lab value to be considered acceptable according to diabetes care standards. If the meter is not within the recommended 20% difference a second comparison should be done. *NB: If the second test is also inaccurate, use a new (See the formulae below in the insert below to calculate the difference between the lab and the glucometer results). meter.*

VARIANCE RESULT CALCULATION

$$\frac{\text{Lab Blood Glucose Results} - \text{Meter Blood Glucose Results}}{\text{Lab Blood Glucose Result}} \times 100 \%$$

- 2. The serum glucose should be** a fasting glucose. If an 8 hour fast is unattainable then it should be at least 2 hours since having had something to eat or drink.
- 3. Within 5 minutes of the Serum Glucose draw**, a finger capillary test should be done using the Meter to be tested.



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4. Lab requisitions should indicate the brand name of the Glucose Meter, the Glucose Meter Check results as well as the Serum Glucose results.

5. Points to Remember:

- i. Make sure the finger to be poked as been cleansed well and that the finger has dried thoroughly.
- ii. It is necessary to obtain a sufficient sample from a finger poke. If there is insufficient blood to complete the Glucometer test another poke on a different finger is necessary.
NB: DO NOT squeeze a second blood sample from the same finger.
- iii. Most Meters are set to test capillary (finger) blood samples only. It is very important that only blood from the finger is used on the meter test strip.
NB: DO NOT use alternate site testing; example the arm.

5. REFERENCES:

- Canadian Journal of Diabetes 42 (2018) S47-S53.
- "Eastern Health" ([\\Eh-dept\easternhealth.local\share\labsMedical\Policies\09-SOPs\01St.John's-Citylabs\09PointofCare\POCTGlucoseMeasurement](#))

6. RESPONSIBILITIES: The Manager of Community Health, Public Health & primary Care and the Manager of Home & Community Care are responsible for the application of this policy.

7. DEVELOPED BY: Joyce Ball, R.N; Diabetes Nurse

8. APPROVALS:

A. Khan, Executive Director

Date:



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Related Policies and Procedures:

APPENDIX III: LAB/METER COMPARISON INFORMATION

health information

Lab/Meter Comparison

A lab test to measure the accuracy of your meter should be done at least once a year and whenever you get a new meter. This test is called a lab/meter comparison. The results from your meter may not match the lab result exactly. The lab result should be within 20 percent of the lab value to be acceptable according to diabetes care standards.

Procedure:

- Take the lab requisition and all of your blood glucose testing equipment with you to the lab.
- Tell the lab staff how long it has been since you last ate.
- It is best to **fast for at least 8 hours** before doing the lab/meter comparison. If you are unable to fast this long, then it should be **at least 2 hours since you last had anything to eat or drink**.
- Right before or right after the lab technician draws blood from your arm, poke your finger and test your blood on your meter. **This should be done within 5 minutes of the lab drawing blood.**
- Record your result and tell the lab technician your result so it can be recorded on the report that goes to your healthcare providers.
- If your meter isn't accurate one of your diabetes educators will call you. Otherwise, we will talk about the results at your next clinic visit.
- You could also speak to your doctor about the results at your next appointment.

Results:

- The following formula is used to calculate the difference between the lab and your meter:

$$\frac{\text{Lab blood glucose result} - \text{meter blood glucose result}}{\text{Lab blood glucose result}} \times 100 = \text{_____}\%$$
- If your meter is not within the recommended 20 percent difference, a second lab/meter comparison should be done. Check with your doctor or diabetes educator.
- If the second test is also inaccurate, call the meter company to get a new meter.

Points to Remember:

- Lab technicians do not check meters.
- If you have problems with the first test, do not squeeze a second blood sample from the same finger. Do another poke in a different finger.
- Meters are set to test capillary (finger) blood only. It is very important that only blood from the finger is used on the meter test strip. Do not use blood from your arm.
- Many factors can affect the result, including when you ate, what you ate, exercise, stress, and the way you did the test.

This material is designed for information purposes only. It should not be used in place of medical advice, instruction and/or treatment. If you have specific questions, please consult your doctor or appropriate healthcare professional.



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