Title: Point-of-Care Random Blood Glucose Test Procedure
SOP Number: , Revision Number:
Review Due Date:
Prepared by:
Approved by:
Department/Function:

1. **PURPOSE:**
   To provide clear, standardized guidelines for performing random blood glucose testing using a glucometer to identify hyperglycaemia potentially indicative of pathological disease, such as diabetes mellitus, in patients.

2. **SCOPE:**
   This SOP applies to all healthcare personnel involved in measuring blood glucose in clinical or community health settings, including physicians, nurses, health assistants and adequately trained interns/fellows (all referred to as providers henceforth). Glucometer readings are performed as an outpatient or point-of-care test.

3. **DEFINITIONS AND ACRONYMS**
   - 3.1. **Random glucose test**: A check of blood sugar at any time of day to identify if symptoms of disease, such as diabetes mellitus are present, unrelated to the timing of last meal.
   - 3.2. **Fasting blood glucose test:** A check of blood sugar after no caloric intake, only water, for at least 8 hours prior. Identifies whether symptoms of disease, such as diabetes mellitus, are present, independent of recent food intake.
   - 3.3. **Hyperglycaemia**: Elevated glucose levels in the bloodstream, ≥200mg/dL (11.1 mmol/L) for a random test and ≥126 mg/dL (≥7.0 mmol/L) for a fasting test.
   - 3.4. **Capillary blood**: Blood from the smallest blood vessels in the body, capillaries.
   - 3.5. **Lancet**: A small, sharp needle used to prick fingertips in order to draw a small amount of blood.
   - 3.6. **Fingerstick**: The action of collecting a small amount of capillary blood with a lancet.
   - 3.7. **Glucometer**: A device used for random blood glucose tests, measuring blood glucose levels via fingerstick.
   - 3.8. **Diabetes mellitus**: A chronic metabolic disease associated with hyperglycaemia due to the body's inability to properly regulate blood glucose levels.
   - 3.9. **Capillary Blood Glucose**: Glucose level in blood obtained from a fingerstick.
   - 3.10. **Fasting Blood Glucose (FBG)**: Test conducted ≥8 hours after last meal.
   - 3.11. **Random Blood Glucose (RBG)**: Test conducted regardless of last meal timing.

4. **MATERIALS:**
   - 4.1. Test Strips (compatible with glucometer)
   - 4.2. Glucometer device (validated and calibrated)
   - 4.3. Lancing device
   - 4.4. Single-use lancets
   - 4.5. Alcohol wipes or cotton ball dipped/soaked in alcohol
   - 4.6. Cotton balls/gauze
   - 4.7. Personal Protective Equipment (PPE- gloves)
   - 4.8. Sharps disposal container

4.9. Waste disposal bags
4.10. Recording sheet or EMR (Electronic Medical Record)

5. **ROLES AND RESPONSIBILITIES:**
   5.1. **Camp Coordinator/Nurse**: Ensure supplies are available and set up testing stations.
   5.2. **Physician/Nurse/Health Assistants/Trained Interns/fellows**: Explain the test to the patient, answer questions, and obtain consent. Ensure patient comfort and equipment readiness.
   5.3. **Physician/Nurse/Health Assistants/Trained interns/fellows**: Perform the test, document results, and determine the need for referral. Ensure proper hygiene and disposal.
   5.4. **Physician/Nurse/Health Assistants/Trained interns/fellows**: Provide interpretation, counselling, and referral if needed. Schedule follow-ups, arrange referrals, and provide patient education on what to expect and on emergency signs that require prompt follow-up.

6. **PROCEDURE Physician/Nurse/Health Assistants/Trained interns/fellows**
   6.1. **Contraindications:**
   6.1.1. Infection or damaged skin at the proposed skin-puncture site is an absolute contraindication. A different digit or the other hand can be used if the skin is intact there.
   6.1.2. Severe bleeding disorder is a relative contraindication. Consult a supervising physician.

   6.2. **Pre-Procedure Preparation:**
   6.2.1. Obtain informed consent.
   6.2.2. Inquire about last meal timing to categorize tests as fasting or random.
   6.2.3. Wash or sanitize hands.
   6.2.4. Prepare data sheet/ or EMR record with patient ID.
   - Room and Equipment Setup: Switch on the glucometer and ensure it is functional.
   - Set out required materials:
     - Test strips
     - Lancing device
     - Single-use lancets
     - Glucometer
     - Alcohol wipes
     - Cotton balls/gauze
     - Gloves

   6.2.5. **Patient Preparation:**
   - Review the patient's full history.
   - Confirm the patient's identity and explain the test.
   - Ensure informed consent has been obtained for blood glucose check.
   - Counsel regarding risks and benefits. Inform the patient that blood glucose testing can indicate whether she has diabetes and how well controlled it is. This knowledge can help her better care for his/her/their health.
   - Inform the patient that she will feel a pinprick on her skin; it may hurt, and there may be skin irritation.
   - Ensure that all patient questions have been answered satisfactorily.

   6.3. **Test Procedure:**

6.3.1. Ask the person to sit comfortably and extend their non-dominant hand.
6.3.2. Clean the fingertip thoroughly(preferably ring or middle finger) with an alcohol swab. The proposed site should be clean, free of dirt or debris. Let the finger air dry.
6.3.3. Insert a new test strip into the glucometer (follow manufacturer instructions). Ensure the code number on glucometer display matches the code number on the test strip container.
6.3.4. Use a sterile lancet to prick the fingertip to draw a blood drop. Provider may need to perform “milking action” on the finger to draw an adequate amount of blood for a successful test.
6.3.5. Discard the lancet in a sharp’s disposal container.
6.3.6. Wipe away the first drop of blood with a cotton ball.
6.3.7. Gently squeeze to get a second drop, then immediately touch the finger with the blood drop to the designated place on the test strip.
6.3.8. Ask the patient to hold pressure on the prick site with a gauze of swab with generous amounts of alcohol.
6.3.9. Wait for glucometer reading (usually takes 5–10 seconds).

6.4. **Post Test Procedure:**
6.4.1. Remove and safely discard the used test strip.
6.4.2. Record the blood glucose value in the Recording sheet/EMR app, noting FBG or RBG.
6.4.3. Communicate results and follow up to the participant and provide basic interpretation according to the ranges below.

Interpretation Guidelines:

- FBG:
  - **Normal**: 70–99 mg/dL (3.9–5.5 mmol/L)
  - **Borderline/Prediabetes**: 100–125 mg/dL (5.6–6.9 mmol/L) → Advise lifestyle modification, repeat testing within 1–3 months.
  - **Abnormal/Diabetes:** ≥126 mg/dL (≥7.0 mmol/L) on two separate occasions → Refer to physician for further evaluation.
- RBG:
  - **Normal:** <140 mg/dL
  - **Borderline/Impaired Glucose:** 140–199 mg/dL → Advise follow-up FBG within 1–2 weeks.
  - **Abnormal/Possible Diabetes:** ≥200 mg/dL, especially with symptoms (large amount of urination daily, weight loss) → Refer immediately for clinical assessment.
- **Emergent glucose: Can be fasting or random**
  - High≥400 mg/dL, at risk for diabetic ketoacidosis. →Refer to nearest hospital/health centre for evaluation
  - Low < 60 mg/dL, at risk of loss of consciousness, provide juice and/or biscuits. Call PHRII physician with last dose of diabetic medication, and full medical history. Have participant go to see primary care physician/hospital on the same day

Follow Up Guidelines:

- **Normal:**
  - Reassure participant, encourage healthy lifestyle, recheck at routine intervals (per program schedule).
- **Borderline/Prediabetes:**
  - Provide counseling on diet, exercise, and weight management.

- Recommend follow-up at health centre for FBG testing in 1–3 months for FBG borderline; in 1–2 weeks for RBG borderline.

- **Abnormal:**
  - Recommend confirmation and management with healthcare provider with repeat testing as soon as possible.
  - Provide counseling on risks of untreated diabetes- damage to kidneys, blindness, risk of heart attack/stroke/amputation, coma, and possibly death
- **Emergent glucose:**
  - **High**
    - Provide counseling on irreversible damage to kidneys, heart, and other organs
    - Provide counseling on possibility of going into a hyperglycaemic coma or even death with persistent increased blood sugars
    - Provide counseling that the participant needs urgent evaluation and treatment at the closest hospital on an emergent basis
  - **Low**
    - Provide counseling on the need for regular meals and timely administration of medication
    - Refer the patient to healthcare provider for medication and/or blood sugar management
    - Provide counseling that persistent low blood sugars can cause hypoglycaemic coma or loss of consciousness
    - Provide counseling that patient needs to be aware of signs and symptoms of hypoglycaemia- palpitations, tremors, jitteriness, feeling faint. In the event of these symptoms, the participant needs to check her blood sugar and take a snack immediately

6.5. **<u>Post-Procedure Care:</u>**

6.5.1. Remove and discard the used test strip safely.

6.5.2. Record the blood glucose value in the Record sheet/EMR app, noting FBG or RBG.

6.5.3. Communicate results and follow up to the participant and provide basic interpretation according to the ranges below.

6.5.4. Inform the patient that mild finger soreness or bruising may occur, and potential skin irritation is normal for the next 1-2 days.

6.5.5. Inform the patient to call immediately if excessive symptoms of dizziness occur, or bleeding, redness, swelling, or pus, occur at the site of fingerstick. Inform the patient that if she is unable to be seen by PHRII within 24 hours, she should seek care from the nearest available physician.

6.5.6. Ensure the patient has PHRII contact information and, if available, offer health education and informational materials.

7. SAFETY AND PRECAUTIONS

7.1. Wash hands/use hand sanitizer with each new patient

7.2. Wear a new pair of clean gloves for each patient to protect yourself and the patient.

7.3. Use one lancet per individual; never reuse.
7.4. Dispose of all medical waste according to biohazard protocols. Lancets should be placed in a Sharps disposable container that is impermeable by needles
7.5. Clean glucometer and all other used instruments before each camp, clinic session and if there is any contamination with body fluids during use.
7.6. In the event of a needlestick injury from the lancet, immediately wash the affected area with soap and water, report the incident to the physician, and follow institutional post-exposure protocols (document exposure, conduct risk assessment, follow up with testing).
7.7. **Emergency Protocols:**
7.7.1. In case of high/low critical values or symptoms (e.g., dizziness, unconsciousness), notify the camp coordinator/PHRII physician on duty and take appropriate action.
7.7.2. Have ORS and emergency contact numbers available on site.

8. **QUALITY CONTROL AND ASSURANCE:**
8.1. Ensure the glucometer is calibrated according to the frequency and indications specified in the manufacturer's booklet.
8.2. Monitor test trip expiry dates.
8.3. Adhere to infection control protocols and universal precautions during the procedure.
8.4. Ensure compliance with patient confidentiality and informed consent requirements.
8.5. Supervise and retrain staff as needed.
8.6. Random audits of technique and documentation

9. DOCUMENTATION AND RECORD KEEPING: Health Assistant/Nurse/Physician
9.1. Record appropriate glucose findings in the patient file (paper or EMR)
9.2. Maintain accurate and detailed records of the test, including glucose value (mg/dL), patient symptoms, immediate actions taken (referral, counseling), and follow-up recommendations.
9.3. Give patient a record of her Blood sugar reading
9.4. Maintain confidentiality
9.5. Follow-Up: Document and Schedule follow-up appointments or referrals as needed.

10. COMPETENCY AND PROFICIENCY: All staff must understand
10.1. Proper use of glucometer. Use checklist provided in Appendix A
10.2. A previously trained nurse/physician must sign off on new personnel instructed to check blood sugars using the glucometer
10.3. Proper calibration of glucometer as calibrated according to the frequency and indications specified in the manufacturer's booklet.
10.4. How to use universal precautions and protect from needlesticks
10.5. Accurate reading and documentation
10.6. Identification of hypoglycaemic and hyperglycaemic emergencies
10.7. Trained staff must approve new staff before they measure BP, and all new staff must sign this SOP to confirm understanding.

11. **REVIEW AND REVISION:**
11.1. This SOP will be reviewed every 2 years or as new evidence and guidelines become available.

12. REFERENCES

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12.4. Cleveland Clinic. (2022, November 22). *A1C: What it is, test, levels & chart.* Cleveland Clinic. https://my.clevelandclinic.org/health/diagnostics/9731-a1c

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14. APPENDICE

14.1 Appendix A: Glucometer Competency checklist

Glucometer competency assessment must be performed using the *Accu-Chek Performa Blood Glucose Meter Competency Checklist provided* by Northern Health. This checklist ensures that all personnel performing point-of-care random blood glucose testing utilize proper technique, safety, and documentation practices.

Checklist access:
https://www.northernhealth.ca/sites/northern_health/files/services/hospital-services/lab-services/documents/performa-meter-competency-checklist.pdf

Prepared By: _____ Signature _____

Title: _____

Approved By: _____ Signature _____

Title: _____

Effective Date: _____ Review Date: _____

Acknowledgment of Review and Agreement to Comply
The following personnel have reviewed this SOP. By signing below, the undersigned confirm that they have read, understood, and agree to follow the above SOP to the best of their ability.
They affirm that:

- All questions have been clarified and answered to their satisfaction.
- They accept responsibility to comply with the SOP as written.
- They will bring any new queries or uncertainties to their supervisor, and if needed, escalate up the chain of command until the question is resolved to their satisfaction.

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