

# SureStepFlexx Glucometer Self-Learning Module

**Legacy Health System  
Patient Care Services  
Clinical Practice Support Team**



Revised 7/2007

## SureStepFlexx Glucometer Self-Learning Module 2007

### Overview

The SureStepFlexx self-learning module has been designed to provide you with a fundamental understanding of the SureStepFlexx glucometer, its features, and the basic principles of operation.

**Refer to LHS Policy 900.2319 (Specimen Collection: Glucose Monitoring) and LHS Policy 900.2319 (Documentation: Inpatient Metabolic Form).**

**Note:** \*\* Annual competency is maintained by either:

- completing 3 patient glucometer tests and 1 quality control test set per year OR
- by completing this module and Post Test/Competency checklist.
- This module and post test may be required in addition to the 3 patient tests and QC set if there have been documented compliance issues.

### Objectives

With the completion of this SLM, you should be able to:

Identify:

- the functions/components of the SureStepFlexx
- important points to remember when performing a test
- criteria for performing a quality control test
- methods for applying a sample to the test strip
- result flags and their significance

Perform:

- SureStepFlexx glucometer power on
- operator ID (employee number) entry
- patient ID entry by **barcode scanning**
- test strip lot number entry
- proper application of blood sample to test strip
- quality control testing
- meter cleaning

## **Module Content**

This self-learning module consists of 4 components:

- Introduction to LHS BG guidelines.
- SureStepFlexx Operator Instructions
- Post Test
- Competency checklist

## **Directions for use**

Complete the following steps:

### **Step 1:**

Read the introduction and SureStepFlexx Operator Instructions

### **Step 2:**

Answer the questions on the Post Test and check your answers against the answer key. (If necessary, repeat the test until you feel comfortable with your knowledge level.)

### **Step 3:**

Gather the following materials:

- SureStepFlexx glucometer
- SureStepFlexx test strips (5)
- SureStepFlexx glucose control solution (high and low)
- Gloves

Demonstrate the competencies on the checklist for a preceptor (any staff member who has met his/her annual competency requirements)

### **Step 4:**

Document completion of competency on your education record and return completed Post Test and competency checklist to unit manager or educator.

## SureStepFlexx Glucometer Self-Learning Module (originated 2004)

### Introduction

Expectations for the care of the diabetic adult patient include maintenance of blood glucose in the range  $>70$  or  $\leq 200$  or as ordered by MD, avoidance of hypoglycemia or DKA and the ability to demo/verbalize diabetes management skills. Please refer to Standard of Care LHS.900.4011 (Adult Patients with Type 1 or Type 2 Diabetes).

The physician will order the blood glucose (BG) monitoring regime.

#### **Note:**

1. Obtain ac breakfast BG no earlier than one hour prior to breakfast
2. Obtain BGs prior to meals (or at least 2 hours following prior meal or snack unless ordered otherwise)
3. Obtain HS BG at least 3 hours after evening meal (before HS snack)
4. Obtain BG at least every 6 hours when patient NPO or not tolerating diet
5. Obtain BG every 2 hours if patient receiving insulin infusion or as per MD orders.

### Responsibilities

**RN only:** Interprets and plans BG monitoring schedule for patient according to physician's order.

**RN or LPN:** Assures tests are completed as ordered. Acts on the results as necessary. Documents test results reported by CNA on the metabolic record.

**RN, LPN or CNA:** Performs BG test with SureStepFlexx glucometer as directed by RN/LPN. Reports results, observations and patient comments about patient's condition to RN/LPN.

Enters notes in SureStepFlexx for critical values and as needed for other test results. May do quality control checks as per unit routine.

### Hypoglycemic/Hyperglycemic Episodes

The LHS hypoglycemia/hyperglycemia protocols can be found attached to the Standard of Care LHS.900.4011 (Adult Patients with Type 1 or Type 2 Diabetes). Refer to these protocols when blood glucose  $\leq 70$  or  $\geq 500$ . **Remember:** Blood glucose results  $<40$  or  $> 500$  require STAT lab blood glucose. Additional lab glucoses for patients  $>500$  mg/dl may be waived if there is a specific MD order (e.g. in the Emergency Department setting).

### Equipment needed to do BG

- Soap, water and towel (Do not use alcohol swab)
- Lancing device and sterile lancet
- SureStepFlexx glucometer
- Test strips
- High and low control solutions
- Kleenex or cotton ball swab

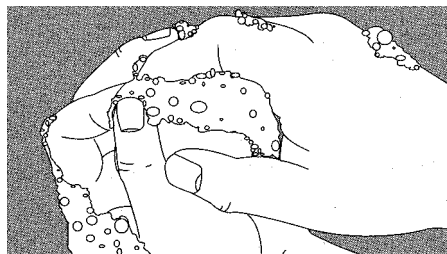
### Procedure for Obtaining Blood Glucose Specimen or "Getting a drop of blood"

**KEY POINT:** Patient ID must be scanned into the glucometer using patient ID band. Reprint wristband if it fails to scan or use default Emergency Department ID form at end of LHS.900.2353.

**KEY POINT:** Getting an adequate drop of blood is one of the most important steps in getting an accurate result.

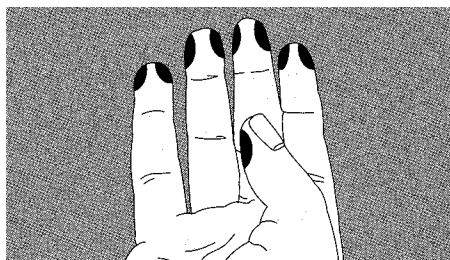
- Use a sterile lancet every time you do a test.
- Do not use the lancet if the cap covering the sharp end of the lancet has been removed or damaged.
- Never use a lancet more than once.
- Wash your hands and don gloves.
- Wash the patient's hands with soap and water. Dry thoroughly.

**KEY POINT:** Warm water stimulates blood flow to the fingers.



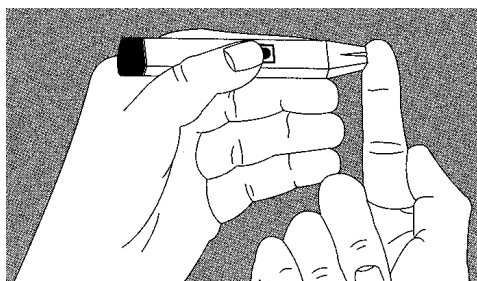
- Choose a site on the side of the fingertip. The side of the thumb may also be used.

**KEY POINT:** The sides of the fingertips are less likely to get sore after repeated punctures.

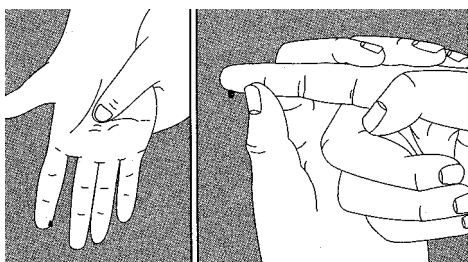


- Remove the covering on the lancet, hold the blood sampler (lancing device) firmly against the side of the finger.

**KEY POINT:** The harder you press, the deeper the puncture.



- Hold the hand down for 10 - 15 seconds before and after the puncture.
- Knead the palm to promote blood flow.
- Squeeze the finger gently if needed, avoid squeezing too hard.



Note: "Hanging" drop is just the right amount of blood for test.

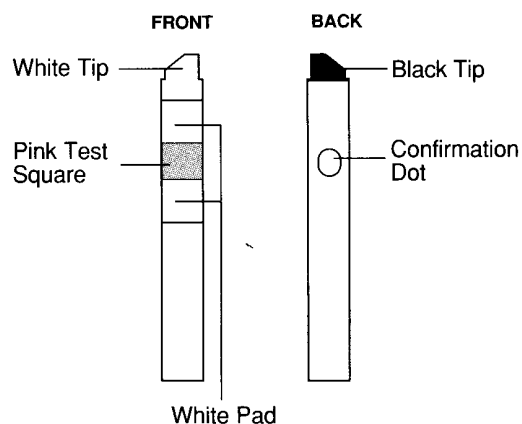
- Remove the lancet carefully from the blood sampler (lancing device).
- Discard used lancet in sharps container.

## Blood Application onto the Test Strips

### USING THE TEST STRIPS:

Apply the patient's blood to the center of the pink test square. Check the confirmation dot on the back of the test strip to verify it is completely blue. This indicates an adequate blood sample has been applied.

Firmly insert the test strip (white tip) all the way into the test strip holder until it stops.  
(Confirmation dot should be facing down).

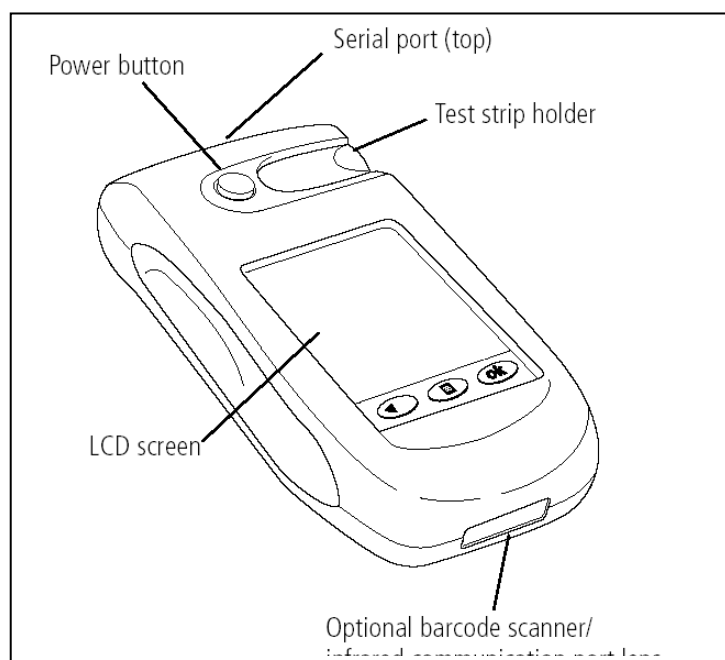


**Key Point: If you insert the test strip after 2 minutes you may get an inaccurate result or an error message.**

### Test strip tips:

White pad absorbs the excess blood that may extend beyond the pink test square. Do NOT apply blood directly onto the white test pad.

- Do not use test strips that are damaged in any way or past expiration date.
- Keep test strips sealed in original moisture resistant, light protected package.
- Store in a cool, dry place.
- Use each strip immediately after removing from the package.
- Remove gloves and wash hands after disposing of used test strip.

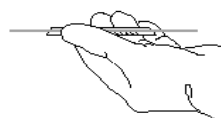
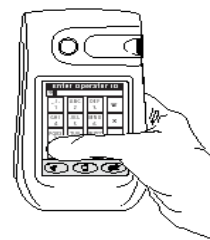


## Scanning a Barcode

If the meter is equipped with a barcode scanner, you may scan IDs and lot numbers.

To scan a barcode, hold the barcode label parallel to and approximately 2 to 6 inches from the meter's scanner.

Press and release the **SCAN** button on the screen. After a successful scan, the information appears in the display field. Press **OK** to confirm the entry.



■ **NOTE:** *If the **SCAN** button does not appear, a barcode scanner is not installed or enabled, or battery power is too low to scan. If power is low, change the meter batteries.*

▲ **CAUTION:** *Do not stare into the laser light or point it towards anyone's eyes while scanning a barcode.*

Note: You must scan the barcode on the patient's armband, not on any part of the chart. Exception: sterile field.

**\*\*\*The following four pages include instructions on performing a quality control test, performing a patient test, LHS documentation requirements and cleaning the apparatus. It is mandatory to check expiration dates on QC and strips before testing. Discard expired materials.**

**PLEASE follow the instructions numerically by reading the boxes provided on the left side of the page first and then return to the top of the page and read the boxes on the right side of the page.**

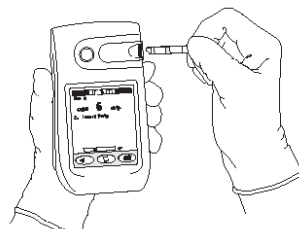
## Performing a Quality Control Test

- 1 Turn on the meter by pressing the blue power button.
- 2 Press **Cont** on the status screen.
- 3 Select **QC Test** from the Main Menu.
- 4 Select a control test.
- 5 Enter your operator ID, or scan your badge. Press **ok**.
- 6 Select the control solution lot number, or scan the vial.
- 7 Select the test strip lot number (and code), or scan the bottle.

▲ **CAUTION:** To obtain accurate results, you must enter the correct test strip lot number (and code) for each new test.

down). Insert within 2 minutes of applying control solution.

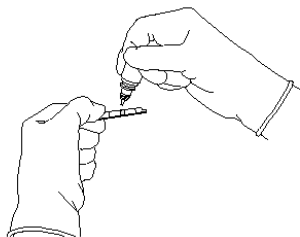
- ◆ **IMPORTANT:** If you fail to completely insert the test strip, the test may start; however, you may receive an out-of-range result.



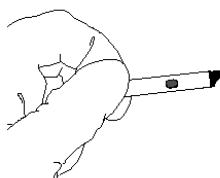
- ◆ **IMPORTANT:** If you insert the test strip after 2 minutes, you may get an out-of-range result or an error message.

The QC test result appears in approximately 30 seconds.

- 8 Gently shake the control solution vial and touch a drop of solution to the center of the pink test square.

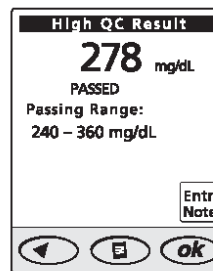


- 9 Check the confirmation dot on the back of the test strip to verify it is completely blue.

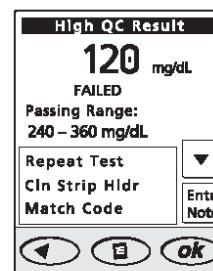


- 10 Firmly insert the test strip all the way into the test strip holder until it stops (confirmation dot should be facing

- ◆ **IMPORTANT:** Do not remove the test strip until the countdown is complete.



Press **ok** and continue with next control test.



Press **Entr Note** and choose at least one comment. Press **ok** and repeat test.

- 11 Remove the test strip.

- ▲ **CAUTION:** If the control solution result fails, repeat the test. The system may not be functioning properly. Do not use the system to test patient blood unless the control result falls within the expected range.

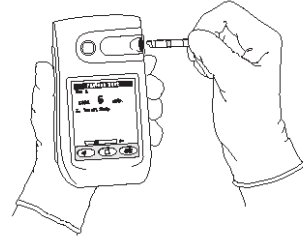
## Performing a Patient Test

- 1 Turn on the meter by pressing the blue power button.
- 2 Press **Cont** on the status screen.
- 3 Select **Patient Test** from the Main Menu.
4. Scan or manually enter operator ID, press OK
5. Scan the patient ID band and press OK
- 6 Select the test strip lot number (and code), or scan the bottle.

▲ **CAUTION:** To obtain accurate results, you must enter the correct test strip lot number (and code) for each new test.

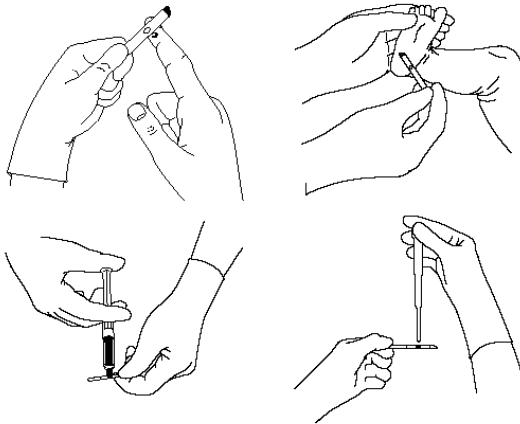
- 9 Firmly insert the test strip all the way into the test strip holder until it stops (confirmation dot should be facing down). Insert within 2 minutes of applying blood.

▲ **CAUTION:** If you fail to completely insert the test strip, the test may start; however, you may receive an inaccurate, low result.

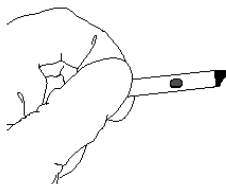


▲ **CAUTION:** If you insert the test strip after 2 minutes, you may get an inaccurate result or an error message.

- 7 Apply the patient's blood to the center of the pink test square.

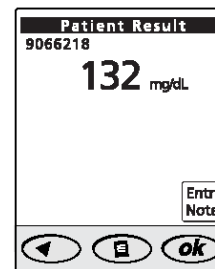


- 8 Check the confirmation dot on the back of the test strip to verify it is completely blue.



The test result appears in approximately 30 seconds.

◆ **IMPORTANT:** Do not remove the test strip until the countdown is complete.




Example

- 10 Remove the test strip.
- 11 Press and continue testing. Or, press **Entr Note** and choose one to three comments that correspond to the patient's current situation. Press .

**Documentation:**

- Results of the blood glucose tests are documented on the patient's metabolic record. Depending on your unit's process, the current metabolic record is usually located in the patient's chart.
- Write in the date (if first test of the day), time of the blood glucose test, test results, number of the meter used and your initials in the appropriate column.

*In Patient Metabolic Record*  
LHS 900.2319 Patient Care *Page 3 of 3*

 **Legacy Health System**  
**ME TABOLIC RECORD**

**Documentation Key:** \* = Progress Note has been made

**Attachment #1**

**Route Key:** SQ, IM, IV, CAPD

**Site Key:** R Arm: RA R Thigh: RT R abd: Rabd  
L Arm: LA L Thigh: LT L abd: Labd

**BG Meter Baseline Comparison:**  
Date: \_\_\_\_\_ Time: \_\_\_\_\_  
Using patient's own meter, Blood Glucose mg/dl = \_\_\_\_\_  
Using hospital meter, Blood Glucose mg/dl = \_\_\_\_\_

Date/Time :															Remarks
<input type="checkbox"/> Patient meter used															
Blood glucose mg/dl															
Ketones															
Dose: → # of Units															
Insulin Type: ↓															
<input type="checkbox"/> Aspart (NOVOLOG)	u013	u013	u013	u013	u013	u013	u013	u013	u013	u013	u013	u013	u013	u013	
<input type="checkbox"/> Regular	u013	u013	u013	u013	u013	u013	u013	u013	u013	u013	u013	u013	u013	u013	
<input type="checkbox"/> NPH	u013	u013	u013	u013	u013	u013	u013	u013	u013	u013	u013	u013	u013	u013	
<input type="checkbox"/> 70/30 (NPH/Regular)	u013	u013	u013	u013	u013	u013	u013	u013	u013	u013	u013	u013	u013	u013	
<input type="checkbox"/> Glargine (LANTUS)	u013	u013	u013	u013	u013	u013	u013	u013	u013	u013	u013	u013	u013	u013	
<input type="checkbox"/>	u013	u013	u013	u013	u013	u013	u013	u013	u013	u013	u013	u013	u013	u013	
<input type="checkbox"/>	u013	u013	u013	u013	u013	u013	u013	u013	u013	u013	u013	u013	u013	u013	
<b>Route (See Key):</b>															
<b>Site (See Key):</b>															
50 units Regular Insulin/ 2.50 mL D5W qtt = (1 unit/5 mL)	/	/	/	/	/	/	/	/	/	/	/	/	/	/	

**Key Point:** Results flag- a note must be entered into the glucometer that the critical value has been reported if a blood glucose test result is <40 or >500 or exceeds other unit specific critical values.

**\*\*Press 'notes' at bottom of glucometer screen to select a 'note' from the list.**

**Key Point:** RN must enter a note describing their nursing actions on the metabolic record or progress notes when test results are outside of the normal and when comment is missed in glucometer.

## Cleaning

### Cleaning the Outside of the Meter

Clean the outside of the meter with a cloth dampened with a 10% bleach solution. Follow with a cloth moistened with water to remove residual bleach. Dry thoroughly.

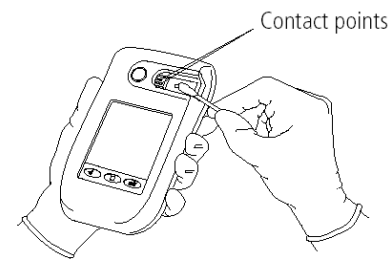
▲ **CAUTION:** Do not get water inside the meter. Never immerse the meter or hold it under running water because it will damage the meter.

### Cleaning the Test Strip Holder

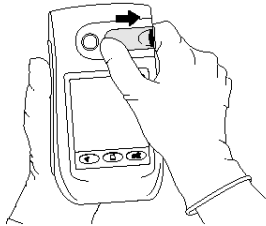
▲ **CAUTION:** Do not use alcohol, glass cleaners, or any cleansers containing abrasives, phenol, or ammonia to clean the test strip holder or lens area because it will damage the meter parts.

▲ **CAUTION:** Bleach residue left on the test strip holder may lead to an error message or an inaccurate, high result.

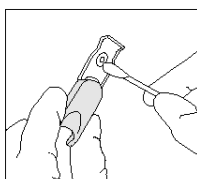
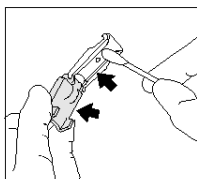
- 3 Thoroughly dry the test strip holder with a soft cloth or lint-free tissue.
- 4 Wipe the lens area and contact points with a cotton swab dampened with a 10% bleach solution. Follow with a swab dampened with water to remove residual bleach.



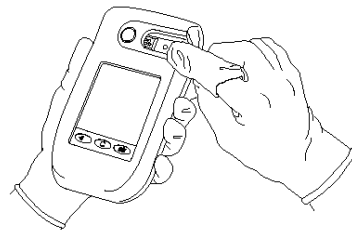
- 1 Remove the test strip holder by pressing down on the left side and sliding it to the right.



- 2 Wipe the test strip holder cover and base with a cotton swab dampened with a 10% bleach solution. Follow with a swab dampened with water to remove residual bleach.



- 5 Dry the lens area with a clean, soft cloth or lint-free tissue. Be careful not to scratch this area.



- 6 Replace the closed test strip holder by sliding it into the meter. Push the test strip holder until it clicks into place.
- 7 Turn on the meter. If an error appears, check to make sure you installed the test strip holder correctly.
- 8 Perform a quality control test.

# POINT OF CARE GLUCOSE NURSING TIPS

## FACTORS THAT IMPACT GLUCOSE RESULTS AND LAB COMPARISONS

### ELEVATES GLUCOSE:

**Too much blood – blood runs over to white pad**

**Low hematocrit – less than 25% causes inaccurately high values**

### LOWERS GLUCOSE:

**Too little blood – confirmation dot has blue and white patches**

**High hematocrit - greater than 60% (such as polycythemia) causes inaccurately low values. Neonates okay up to 65%.**

**Excessive water loss – dehydration Too much water loss makes blood thicker and it doesn't properly penetrate strip**

### INACCURATE RESULTS:

Circulation problems – Conditions affecting circulation to hands including shock, some drugs called vasoactive agents, and Raynaud's disease may lead to large differences.

**Low oxygen content – along with hematocrit near 25% and glucose greater than 200 mg/dl – falsely high**

Vitamin C (ascorbic acid) - levels at physiological concentrations over 3 mg/dl

Lipemic samples - greater than 3,000 mg/dl triglycerides

Mannitol – may interfere at levels greater than 5000 ug/ml when glucoses are high. Estimate of 8% positive bias with mannitol at 10,000 ug/ml

Manufacturer's guidelines indicate that comparisons between the glucometer and the lab should be within +/- 20%. Laboratory recommends that for values less than 80 mg/dl, a +/- 10 mg/dl limit is used instead of a percentage.

For most accurate comparison with the lab, the specimens should be collected at the same time. This could mean a blood draw into a green top tube and a drop forced from the needle onto the strip. In lieu of this, comparison specimen should be drawn within ½ hour of the questionable capillary specimen and before any treatment or feeding occurs.

## Written Post Test

Mark all answers that are correct-there may be more than one correct answer.

- 1 What is the function of the SureStepFlexx Meter?
  - a. To provide qualitative indication of a high blood glucose level
  - b. To measure a patient's glucose level from urine sample
  - c. To measure a patient's blood glucose level from a whole blood sample
  - d. To diagnose diabetes
  
2. Louis is your diabetic patient. Which of the following foods are *not* a good hs snack for Louis?
  - a. Cheese and crackers
  - b. Half a banana
  - c. Ben and Jerry's Chunky Monkey ice cream
  - d. Grapes and milk
  - e. Sugar-free egg custard
  
3. When you turn on the meter, which items should you check on the status screen?
  - a. QC testing status
  - b. Available memory
  - c. Barcode scanner status
  - d. Battery life
  
4. What critical precaution relates to the barcode scanner?
  - a. Do not expose strips to laser light
  - b. Do not stare into the barcode scanner while the laser light is on
  - c. Do not point the barcode scanner towards anyone's eyes while the laser light is on
  - d. Do not insert a test strip while the laser light is on
  
5. Match the following descriptions with the correct test strip area.
 

a. Faces up during insertion	___Confirmation dot
b. Area where blood is applied	___White pad
c. Turns blue with adequate sample	___White tip



12. How soon after the test strip is inserted will the result appear (closest approximation?)
- 2 minutes
  - 1 minute
  - 30 second
  - 10 seconds
13. What should you do if control result falls outside the expected range?
- Mark the result with a note
  - Notify the system administrator
  - Continue with a patient test
  - Repeat the test
14. The SureStepFlexx meter, when used with the SureStepPro test strips, can be used to test which of the following blood sample types?
- arterial
  - venous
  - capillary
  - neonatal
15. Which of the following methods can be used for applying blood to the test strip?
- Heel stick
  - Finger stick
  - Pipette
  - Syringe
16. Identify indicators of improper application of blood to the test strip.
- Confirmation dot does not turn completely blue
  - White pad becomes saturated
  - System error message
17. Match the meter messages with their meaning.
- Critical Low      \_\_\_result is above 500 mg/dl
  - HIGH                \_\_\_result is above critical range

- c. Critical High      \_\_\_result is below critical range
18. What cleaning solution should be used to clean the SureStepFlexx meter lens area and test strip holder?
- a. Windex™
  - b. 10% bleach solution
  - c. alcohol
  - d. any ammonia-based cleaning solution

**Answer Key:**

- 1. c
- 2. c
- 3. a, d
- 4. b, c
- 5. c, d, a, b
- 6. a, b, c, d
- 7. a, b, c, d
- 8. a
- 9. b
- 10. c
- 11. a
- 12. c
- 13. a, d
- 14. a, b, c, d
- 15. a, b, c, d
- 16. a, b
- 17. b, c, a
- 18. b

**SureStepFlexx Meter Training Competency Checklist:**

Training session date: \_\_\_\_\_

Trainee name and signature: \_\_\_\_\_/\_\_\_\_\_

Certified nurse's name and signature: \_\_\_\_\_/\_\_\_\_\_

**Review LHS Policy 900.2353**

**Instructions:** Perform the following steps for a certified nurse or instructor:

\_\_\_ Turn on the meter

\_\_\_ Check the QC status and battery status.

\_\_\_ Enter your operator ID.

\_\_\_ Select appropriate controls to use.

\_\_\_ Enter the control solution and test strip lot numbers.

\_\_\_ Check expiration date of QC and strip bottles.

\_\_\_ Check that confirmation dot on back of strip is white before blood or QC is applied.

\_\_\_ Apply the control solution.

\_\_\_ Insert the test strip.

\_\_\_ Explain the results and the next steps.

\_\_\_ Remove the test strip.

**\*\*Put the completed written test and competency checklist on your education record \*\*\***

**References:**

- LHS.900.2353.PatientCare: *Glucose Monitoring; Use of Lifescan ® SureStepFlexx ® Whole Blood Glucose Bedside Unit*
- LHS.900.2130.PatientCare: *Glucometers: Quality Control for Personal Patient Glucometers*
- LHS.900.2319.PatientCare: *Inpatient Metabolic Record*
- LHS.900.4011.PatientCare: *Standards of Care: Adult Patients with Type 1 or Type 2 Diabetes*
- *Nursing Procedure 4<sup>th</sup> Ed.* Lippincott, Williams & Wilkins, 2004
- *SureStepFlexx: Meter Quick Reference Guide.* LifeScan, 2002