MODULE 4. Blood Glucose Monitoring

EDUCATIONAL OBJECTIVES

Upon completion of this activity, participants will be better able to:

1. List the appropriate steps in using a blood glucose (BG) monitor;
2. Relate how to interpret self-monitoring of blood glucose (SMBG) results;
3. Discuss glycosylated hemoglobin (HbA1c) and why it is important; and
4. Recognize how patients with diabetes make therapy changes based on their SMBG readings with the help of their health care team.

Post-test/Rationale

1. Out of the 4 general steps in using a blood glucose (BG) meter in self-monitoring of blood glucose (SMBG) listed below, which step should occur FIRST?

   A. Placing the blood drop on the test strip
   B. Washing the testing site with warm water and soap***
   C. Placing the lancet in the sharps container
   D. Lancing the finger

Correct Answer: B

Washing the site of testing first will ensure no contaminants are present that could impact results, and thus should occur before lancing or placing the blood drop on the test strip. The lancet is placed in the sharps container as the last step, after it has been used.

2. In which of the following patients would it be MOST appropriate to counsel him or her to test BG multiple times daily (i.e., 4 or more times daily)?

   A. A patient with type 2 diabetes mellitus (T2DM) who is not taking any medications to lower BG
   B. A patient with prediabetes who is taking metformin (Fortamet, Glucophage, Glucophage XR, Glumetza)
   C. A patient on an insulin pump***
   D. Both A and B

Correct Answer: C

Literature supports benefits of more frequent testing in patients on intensive insulin therapy. For other patients, the evidence is less clear, and can even result in a cost burden on the patient or health system if testing is overused.

3. Patients with uncontrolled diabetes mellitus should have their glycosylated hemoglobin (HbA1c) tested:

   A. Daily
B. Every 3 months***
C. Every 6 months
D. Annually

Correct Answer: B
Given that HbA1c represents average BG over several months, it is reasonable to monitor HbA1c results about every 3 months in those who are uncontrolled, given testing more frequently may not accurately capture treatment regimen changes. Patients with controlled diabetes may have HbA1c tests monitored biannually.

4. A patient tests his or her BG in the afternoon 3 hours after eating lunch. The SMBG result from the meter is 247 mg/dL. Which of the following factors could impact SMBG acutely and should be discussed with the patient to assess the reasons for this elevation in BG?

A. Physical activity
B. Carbohydrate content in meals
C. Concurrent stress or illness
D. All of the above***

Correct Answer: D
All of the above factors can impact point-of-care SMBG results and should be assessed by interviewing the patient and asking questions about these factors.

5. An adult patient with type 2 diabetes mellitus (T2DM) presents to your pharmacy and reports his or her HbA1c result this month was 8.5%. Why might you want to refer this patient to the pharmacist for a consult?

A. The general HbA1c goal for patients with diabetes is less than 7%.***
B. The general HbA1c goal for patients with diabetes is less than 6%.
C. HbA1c tests do not represent long-term glucose control, so a report of your SMBG has to be evaluated first.
D. HbA1c tests are not used commonly in practice, so a report of your SMBG results need to be evaluated first.

Correct Answer: A
Per American Diabetes Association (ADA) guidelines, the general HbA1c goal for patients with diabetes is less than 7%

6. Which of the following statements is TRUE?

A. A fasting BG result of 145 mg/dL is at goal per the ADA guidelines.
B. An HbA1c value of 11% at baseline with comorbid complications associated with diabetes suggests long-standing disease.***
C. Concurrent stress and illness could potentially exacerbate hypoglycemia in patients with T2DM.
D. Nonadherence with insulin could be a potential cause of isolated hypoglycemia.

Correct Answer: B
Answer A is incorrect because goal is 80 to 130 mg/dL per ADA guidelines. Concurrent stress and illness and nonadherence with insulin could exacerbate hyperglycemia. A significantly elevated HbA1c at baseline with multiple complications of diabetes could indicate long-standing disease that has been asymptomatic.

7. In patients with T1DM, an elevated HbA1C (above goal) is most likely a consequence of:

A. Inadequate insulin therapy
B. A reduction in carbohydrate content in meals
C. An increase in physical activity
D. The weather

Correct Answer: A
Patients with T1DM are completely insulin-dependent, and inadequate insulin therapy is the most common cause of elevated HbA1c. Concurrent stress or illness can increase BG acutely, but is not likely to impact long-term glycemic markers.

8. Which of the following could result in an elevated HbA1c reading in a patient with T2DM?

A. The diabetes treatment regimen may be too aggressive.
B. The anti-hyperglycemic regimen is not sufficiently addressing the patients glycemic needs.
C. Increases in physical activity over time
D. Both B and C

Correct Answer: B
Elevated HbA1c indicates hyperglycemia, and the only option capable of doing so would be Answer B.

9. When deciding how to advance therapy in patients with diabetes, which of the following factors should be considered?

A. Drug efficacy
B. Side-effect profile of medications used
C. Effects of the medication on the patient’s weight
D. All of the above

Correct Answer: D
All of the above factors should be considered when deciding whether to add a medication or titrate a medication dose upward in patients with diabetes.
10. Which of the following statements is TRUE?

A. Heath care practitioners (HCPs) in the community setting without diabetes treatment protocols in place should make interventions without contacting the patient’s primary provider

B. Literature has suggested that each additional agent after metformin will lower the HbA1c by approximately 3%

C. In all cases of interventions, HCPs should offer patients basic counseling on disease state and medications.***

D. HCPs should focus on making interventions that increase the complexity of patients’ diabetes treatment regimens.

Correct Answer: C

HCPs assisting in diabetes care without treatment protocols in place should focus on simple interventions that do not add too much complexity to the regimen, and they should always provide basic education and counseling.