Module 5. Understanding Insulin Therapy

EDUCATIONAL OBJECTIVES

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

1. Define the basic physiologic concept of basal-bolus insulin;
2. Explain the proper insulin administration techniques;
3. Identify available insulin products and discuss how they are used in diabetes treatment plans;
4. Recognize the warnings and precautions associated with insulin use;
5. Discuss barriers to insulin use; and
6. List questions to ask patients who are using insulin to identify if they may need additional counseling from a pharmacist.

Post-test/Rationale:

1. Which of the following is a rapid-acting insulin product?
   A. Insulin detemir (Levemir)
   B. Insulin aspart (Novolog)***
   C. Insulin glargine (Basaglar, Lantus, Toujeo)
   D. Regular insulin
   Correct answer: B
   Rationale: Insulins detemir and glargine are both long-acting agents; regular insulin is a short-acting insulin. Insulin aspart is the only rapid-acting insulin product listed.

2. Basal insulin is responsible for which of the following actions?
   A. Suppressing glucose production by the liver***
   B. Increasing glucose concentrations after meals
   C. Reducing production of fatty acids
   D. Stimulating ketone production
   Correct answer: A
   Rationale: Basal insulin’s primary function is to suppress glucose production by the liver.
3. Which of the following is TRUE when initiating a basal-bolus insulin regimen in patients with type 2 diabetes mellitus (T2DM)?

A. Patients should monitor their blood glucose levels frequently***
B. Insulin administration should begin with 4-times-daily dosing
C. Patients with T2DM should not use the basal-bolus method of insulin therapy
D. Therapy should be initiated with 10 units of regular insulin at bedtime

Correct answer: A

Rationale: Basal-bolus insulin requires frequent self-monitoring of blood glucose (SMBG) for pattern management. In patients with T2DM, dosing usually begins with a once-daily basal insulin dose. Insulin therapy is often initiated with 10 units of a long-acting insulin product once daily.

4. JP has type 2 diabetes mellitus (T2DM). Her provider has suggested that she initiate insulin therapy and she brings a prescription for a long-acting basal insulin to your pharmacy. She is reluctant to use insulin because she thinks insulin is only for patients who are nearing the end stages of the disease. How can you assure JP this is not the case?

A. Tell her that her diabetes has progressed to type 1 and, therefore, requires insulin therapy
B. Inform her that insulin is the most cost effective way to treat diabetes
C. Tell her that replacing insulin is an effective treatment for T2DM and it can be used early in the disease process for some patients***
D. Tell her that a poor diet likely that caused her diabetes to get out of control and offer her a consultation with a dietician

Correct answer: C

Rationale: Insulin can be a very effective treatment for T2DM at many disease stages, depending on patient goals, lifestyles, and preferences. Patients often have misconceptions about using insulin, but proper counseling and education can help alleviate these fears.

5. Which one of the following is not an open-ended question that may be used to assess a patient's comfort level with insulin therapy?

A. Are you at the pharmacy today to pick up your prescription?***
B. How have you been feeling since you started your insulin?
C. How are you tracking your blood sugars?
D. What difficulties do you have with your injections?

Correct answer: A

Rationale: Open ended-questions, such as answers B, C, and D, allow a patient to speak freely about their experience. Asking open-ended questions in the dialogue between the pharmacy technician and patient may help assess a patient’s comfort level with insulin therapy. Answer A is a closed-ended question, requiring a “yes” or “no” answer, and may not be useful in assessing a patient’s comfort level with insulin therapy.

6. When educating a patient with type 2 diabetes about administering insulin, all of the following are appropriate recommendations, EXCEPT:

   A. Inspect insulin vials for contamination
   B. Inject insulin at a 90-degree angle
   C. Withdraw needle quickly and apply light pressure to the injection site
   D. Inject the insulin within 1 inch of the navel***

Correct answer: D

Rationale: The area around the navel is quite vascular and should be avoided when injecting subcutaneous insulin.

7. RK has diabetes and is using insulin. He loses consciousness from a hypoglycemic event. Which of the following is a possible treatment option for RK?

   A. Pour fruit juice directly down his throat
   B. Inject an extra dose of insulin
   C. Crumble cookies into his mouth
   D. Administer glucagon***

Correct answer: D

Rationale: If a patient is rendered unconscious from low blood sugar, do not attempt to feed the patient any food or drink. Administer the emergency treatment, glucagon, if available, and if a caregiver has been properly trained to administer it. Call 911 if the patient does not respond to glucagon treatment.
8. Which of the following is a common adverse event and a patient-level barrier associated with insulin use?

A. Mild hyperglycemia  
B. Lipodystrophy  
C. Painful injections***  
D. Weight loss

Correct answer: C

Rationale: Several studies have shown that patients are concerned about the pain of self-injections. The process of self-monitoring blood glucose levels can be more painful than injecting insulin because of the number of nerves in the fingers; subcutaneous tissues contain very few nerves so there is little to no pain with insulin injections. Education about the expectations and adverse effects of treatment will help decrease patient-level barriers to insulin use.

9. Consider the onset of action of insulin glulisine (Apidra). When is the most appropriate time to administer this insulin?

A. 0 to 5 minutes before a meal***  
B. 10 to 15 minutes after awakening in the morning, without regard to food intake  
C. 30 to 60 minutes before a meal  
D. 30 to 60 minutes after a meal

Correct answer: A

Rationale: Rapid-acting insulins must be injected immediately before a meal. If insulin glulisine is administered 30 to 60 minutes before a meal, this may lead to hypoglycemia.

10. A patient is using a basal insulin product and asks if he needs to eat something each time he injects it. A correct counseling tip conveyed by the pharmacist might be:

A. Eat immediately after injecting any type of insulin, since the insulin will cause blood sugar levels to fall quickly  
B. Drink a glass of milk after injecting insulin, since this will improve the absorption of insulin  
C. You do not need to eat food after injecting basal insulin, since it acts as a low-dose background insulin throughout the day***
D. You should eat a meal approximately 1 hour before you inject any type of insulin, because eating after you inject the insulin may cause nausea

*Correct answer: C*

Rationale: Bolus or mealtime insulin requires that patients eat immediately or shortly after an injection. Basal insulin does not have requirements for eating since it only provides a low, background dose of insulin.