Module 3. Non-Insulin Injectable Diabetes Medications

EDUCATIONAL OBJECTIVES

1. Discuss the role of non-insulin injectable agents for achieving treatment goals in patients with type 2 diabetes;
2. Recognize the hierarchy of non-insulin injectable agents within current treatment recommendations;
3. Define the incretin effect and how it relates to the mechanism of action (MOA) of non-insulin injectable agents;
4. Discuss the MOA, adverse effects, and potential drug interactions associated with the use of non-insulin injectable agents; and
5. Explain Risk Evaluation and Mitigation Strategy (REMS) programs related to new non-insulin injectable agents.

Post-test/Rationale

1. How do glucagon-like peptide-1 receptor agonists work to control blood sugar levels in patients with diabetes?

A. By increasing levels of thyroid hormone
B. By increasing appetite
C. By mimicking incretin hormone activity ***
D. By causing excess sugar in the body to be excreted by the kidneys

Correct answer: C

Rationale (Objective #1): Glucagon-like peptide-1 receptor agonists activate natural glucagon-like peptide-1 receptors and mimic incretin hormone activity.

2. Which non-insulin injectable is dosed once weekly?

A. Liraglutide
B. Pramlintide
C. Dulaglutide***
D. Regular-release exenatide

Correct answer: C

Rationale (Objective #4): Dulaglutide is dosed only once weekly. The other glucagon-like peptide-1 receptor agonists listed are dosed daily.

3. Which of the following adverse effects is common to all non-insulin injectable medications for diabetes?

A. Upper respiratory tract infections
B. Pancreatitis
C. Weight gain
D. Nausea***

Correct answer: D

Rationale (Objective #3): All glucagon-like peptide-1 receptor agonists (GLP-1 RAs) and pramlintide cause nausea. Only GLP-1 RAs are associated with pancreatitis. Only albiglutide is associated with upper respiratory tract infections. All GLP-1 RAs are associated with weight loss.

4. How do incretins help regulate blood glucose?

A. They are released from the gastrointestinal tract and work to slow gastric emptying, promote insulin release, and suppress glucagon release***
B. They are released from the pancreas and they work to slow gastric emptying and suppress glucagon release
C. They are released from the gastrointestinal tract and they work to suppress insulin release and promote glucagon release
D. They are released from the pancreas and they work to suppress insulin release and promote glucagon release

Correct answer: A

Rationale (Objective #4): Incretins are released from the gastrointestinal tract. They bind to incretin receptors to slow gastric emptying, promote insulin release, and suppress glucagon release.

5. Which of the following is a requirement of the Risk Evaluation and Mitigation Strategy (REMS) program for extended-release exenatide?

A. Pharmacists must distribute a medication guide with each dispensing of exenatide
B. Manufacturers must provide educational materials to prescribers***
C. Exenatide may only be prescribed if the patient failed metformin therapy
D. Prescribers must enroll in the online REMS program

Correct answer: B

Rationale (Objective #5): The only requirement for the REMS program for extended-release exenatide is that manufacturers make educational materials available to prescribers. It does not require dispensing a medication guide and there are no enrollment requirements or prescribing limitations.

6. Which of the following is an appropriate counseling point for a patient receiving albiglutide?

A. Tap the single-dose pen against your palm vigorously 80 times and then immediately inject the dose
B. Administering this medication at mealtime may help reduce nausea***
C. Consult your physician about increasing your dose of insulin after you start albiglutide
D. You must enroll in the manufacturer’s risk evaluation program before albiglutide can be dispensed

Correct answer: B

Rationale (Objective #6): For all glucagon-like peptide-1 receptor agonists, administering the medication at mealtime may help reduce nausea. Albiglutide single-dose pens should be rocked side to side slowly 5 times and then allowed to rest before a patient injects the dose. Albiglutide can cause hypoglycemia when taken at the same time as insulin or insulin secretagogues; the manufacturer recommends lowering doses of these agents when used with albiglutide. The risk evaluation and mitigation strategy program requires that manufacturers provide educational materials to health care providers; there is no requirement for patient education or enrollment.

7. Which non-insulin injectable is indicated for both type 1 and type 2 diabetes?
   A. Exenetide
   B. Albiglutide
   C. Liraglutide
   D. Pramlinitide ***

Correct answer: D

Rationale (Objective #2): Pramlinitide, a synthetic form of the hormone amylin, is indicated for both type 1 and type 2 diabetes. The other medications are glucagon-like peptide-1 receptor agonists, which are only indicated for type 2 diabetes.

8. What is the purpose of the pramlintide Risk Evaluation and Mitigation Strategy program?
   A. To restrict dispensing to patients until all other options have been tried and failed
   B. To restrict dispensing to non-pregnant patients only
   C. To educate prescribers about the potential risk of severe hypoglycemia***
   D. To educate prescribers about the potential risk of acute pancreatitis

Correct answer: C

Rationale (Objective #5): Pramlintide is subject to a Risk Evaluation and Mitigation Strategy program designed to inform health care providers of the risk of severe hypoglycemia and the need to reduce insulin doses upon initiation of pramlintide therapy.

9. Which of the following would be an appropriate counseling point for a patient using the single-dose kit for extended-release exenatide?
   A. This medication must be injected within 30 to 60 minutes before a meal
B. Do not take oral contraceptives while you are using exenatide
C. This medication may cause your appetite to increase, so it may be helpful to administer it with meals
D. This medication must be prepared for administration by mixing the contents of the vial with the liquid in the syringe***

Correct answer: D

Rationale (Objective # 6): The extended-release exenatide kit may be used without regard to food. Exenatide suppresses appetite. The injection does require reconstitution prior to administration. While all glucagon-like peptide-1 receptor agonists may affect the absorption of oral medications, no specific dose adjustments or contraindications are noted by the manufacturer.

10. How can non-insulin injectable agents such as exenatide cause potential drug interactions?

A. By slowing gastric emptying ***
B. By causing injection site reactions
C. By increasing blood sugar levels
D. By decreasing thyroid hormone secretion

Correct answer: A

Rationale (Objective # 4): Many non-insulin injectable agents slow gastric emptying and, therefore, can potentially alter the absorption of other drug products.