Self-Assessment Test

Management of Hyperglycemia in Acute-Care Settings and the Transition to Ambulatory Care

This program is located at **http://ashpmedia.org/symposia/hyperglycemia**

This self-assessment test has been provided as a study aid only. At the conclusion of the internet-based activity, click on "Take CE Test" to proceed to the ASHP Learning Center and take the online activity post-test. You may print your CE statement immediately after successful completion of the post-test and evaluation.

There are a total of 19 questions associated with this self-assessment test.

1. According to 2007 data from the National Diabetes Information Clearinghouse, approximately _____ of the 23.6 million patients with diabetes is undiagnosed.

   a. One in ten.
   b. One in five.
   c. One in four.
   d. One in three.

2. Type 1 diabetes is characterized by

   a. A genetic predisposition and precipitating event, which lead to an absolute insulin deficiency.
   b. A genetic predisposition and precipitating event, which lead a relative insulin deficiency.
   c. Insulin resistance and β-cell failure, which lead to an absolute insulin deficiency.
   d. Insulin resistance and β-cell failure, which lead to a relative insulin deficiency.

3. Type 2 diabetes mellitus is characterized by

   a. Insulin deficiency, which leads to β-cell failure.
   b. β-cell failure, which leads to insulin resistance.
   c. Insulin resistance and β-cell failure, which lead to a relative insulin deficiency.
   d. Relative insulin deficiency and β-cell failure, which lead to insulin resistance.

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4. The pharmacy department at ABC Hospital, together with an endocrinologist, two internists, and the director of nursing, is interested in developing a glycemic control team to serve non-ICU units of the hospital. This committee is in early stages of discussion and will be meeting with administrators and key hospital staff next week to get the go-ahead to proceed with developing their proposal. Its goal at this point is to convince administration and staff of the problems associated with hyperglycemia in hospitalized patients. As part of its evidence, the committee can cite the American College of Endocrinology and American Diabetes Association (ACE/ADA) Task Force on Inpatient Diabetes (2006), which reported that all of the following are consequences of hyperglycemia in hospitalized patients EXCEPT

    a. More nursing home care after discharge.
    b. Increased mortality risk when diabetes is not diagnosed and not effectively treated during the hospital stay.
    c. Impaired healing, leading to increased length of stay and other complications.
    d. Decreased risk of hospital-acquired infections.

5. As further support for the need to improve glycemic control at ABC Hospital, the committee can cite data from a study by McAllister et al. (2005) that illustrate which of the following outcomes in noncritically ill patients?

    a. General medical and surgery patients with blood glucose concentrations greater than 180 mg/dL on postoperative day 1 had almost a double rate of infection than similar patients with lower concentrations.
    b. Patients with community-acquired pneumonia with blood glucose concentrations greater than 200 mg/dL had increased rates of mortality and complications compared with similar patients with lower concentrations.
    c. Every 25-mg/dL increase in perioperative blood glucose concentrations over the 3-day period after coronary artery bypass grafting was associated with 1.8-day increase in length of stay and increased risk for deep sternal wound infections.
    d. The risk of acute renal failure increases sharply when blood glucose is greater than 220 mg/dL.

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6. The committee at ABC Hospital gets administration approval to begin drafting a subcutaneous insulin protocol and order set for use in noncritically ill patients. Which of the following recommendations about the transition from intravenous to subcutaneous insulin therapy in hospitalized patients would be appropriate to include in the protocol?

    a. Treatment with intravenous and subcutaneous insulin should overlap because of the short half-life of intravenous insulin and risk of hyperglycemic escape.
    b. Treatment with intravenous and subcutaneous insulin should not overlap because of the long half-life of intravenous insulin and risk of hypoglycemia.
    c. Treatment with subcutaneous insulin should not be initiated until the patient is able to consume food.
    d. Long-acting subcutaneous insulin analogs should be used with meals when the ability to consume food is uncertain.

7. After reviewing the literature and consulting with colleagues at other institutions, the committee at ABC Hospital recommends the use of basal-bolus insulin therapy instead of sliding-scale regular insulin for glycemic control in hospitalized patients. Which of the following statements describes a shortcoming of sliding-scale insulin in hospitalized patients that could have influenced that decision?

    a. It matches insulin doses to nutritional intake.
    b. It is reactive instead of proactive and provides no scheduled basal insulin.
    c. It is time consuming because it requires multiple daily blood glucose measurements.
    d. It is complicated because the sliding-scale insulin regimen takes into account previous oral agents and insulin requirements.

8. The committee also intends to present the results of the Randomized Study of Basal Bolus Insulin Therapy in the Inpatient Management of Patients with Type 2 Diabetes (RABBIT 2) comparing basal-bolus insulin therapy with sliding-scale regular insulin? What did this study demonstrate?

    a. The mean daily insulin dose was lower with basal-bolus insulin.
    b. The percentage of patients achieving glycemic control was greater with basal-bolus insulin.
    c. The incidence of hypoglycemia was lower with basal-bolus insulin.
    d. The mean length of hospital stay was shorter with basal-bolus insulin.

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9. TU is a 48-year-old man admitted to a general medical unit at XYZ Hospital for community-acquired pneumonia. Medications on admission included amlodipine (for hypertension), irbesartan and hydrochlorothiazide (for hypertension), and simvastatin (for dyslipidemia). His vital signs this morning: Temperature 102.0 °F, blood pressure 144/88 mm Hg, HR 96 bpm, respiratory rate 22. Weight 220 pounds (100 kg), height 5 ft 10 in. Labs at time of admission were all within normal range EXCEPT an elevated white blood cell count with left shift and blood glucose 215 mg/dL. A1C and lipid levels were ordered and pending. His mother and sister have type 2 diabetes. According to the American Association of Clinical Endocrinologists, which of the following would be an appropriate target peak postprandial blood glucose concentration for TU while he is hospitalized in a general medical and surgical unit?

    a. Less than or equal to 80 mg/dL.
    b. Greater than or equal to 110 mg/dL.
    c. Less than or equal to 126 mg/dL.
    d. Less than or equal to 180 mg/dL.

10. Antimicrobial therapy for TU is begun. The A1C ordered on admission comes back as 9.1%. Based on this A1C, with what certainly can the diagnosis of type 2 diabetes be made?

    a. 25%.
    b. 50%.
    c. 75%.
    d. 100%.

11. TU's physician interprets the A1C of 9.1% as undiagnosed diabetes, and she orders basal-bolus insulin. While his appetite is diminished, TU is able to eat. Approximately what percentage of TU's total daily dose of insulin should be administered as basal insulin?

    a. 20-30%.
    b. 40-50%.
    c. 60-70%.
    d. 80-90%.

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12. After receiving basal-bolus insulin with correction doses for two days, TU's blood glucose concentration stabilizes but then drops to 60 mg/dL the next afternoon. The nurses were doing finger blood glucose monitoring before meals and at bedtime, according to protocol. Which of the following factors would best explain TU's hypoglycemic reaction?

    a. Rapid-acting insulin was administered at 11:30 am, but before lunch he was transported to radiology for a chest x-ray.
    b. Rapid-acting insulin was administered immediately after lunch.
    c. There was a stacking effect of the short-acting insulin.
    d. TU's appetite was back, and he ate his complete lunch.

13. It is anticipated that TU will be discharged within one or two days. According to the Society of Hospital Medicine's general guidelines for glycemic control, which of the following discharge plans would be most appropriate for TU?

    a. He should be screened for diabetes in the future.
    b. He should be discharged on a diabetes diet and be tested for diabetes as soon as he is metabolically stable.
    c. He should be discharged on a diabetes diet and a low-dose oral diabetes drug.
    d. He should be discharged on basal-bolus insulin.

14. If TU's AIC on admission were 6.8% instead of 9.1%, which of the following would be the most appropriate discharge plan?

    a. He should be screened for diabetes in the future.
    b. He should be discharged on a diabetes diet and be tested for diabetes as soon as he is metabolically stable.
    c. He should be discharged on a diabetes diet, a low-dose oral diabetes drug, and basal insulin.
    d. He should be discharged on basal-bolus insulin.

15. When a patient receiving insulin in the hospital is discharged on insulin, the starting dose of basal insulin after discharge should be

    a. 20 units at bedtime.
    b. No more than 50% of the basal insulin administered on the last day of hospitalization.
    c. No more than 50% of the total daily dose of insulin administered on the last day of hospitalization.
    d. No more than 90% of the total daily dose of insulin administered on the last day of hospitalization.

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16. As a patient with newly diagnosed diabetes, TU receives the hospital's standing order for diabetes education. "Survival skills" diabetes education should include all of the following elements EXCEPT

    a. Basic description of diabetes and how to prevent complications.
    b. How to self monitor blood glucose.
    c. How to count carbohydrates.
    d. How to treat hypoglycemia.

17. At discharge, TU was apprehensive about managing multiple insulin injections himself at home. He was discharged on basal insulin once daily in the evening and metformin 1000 mg twice daily. Since discharge, he has seen his primary care physician, and he is doing well on this regimen. Three months after discharge, TU and his primary care physician are pleased that his A1C has fallen to 7.2%, but TU says he wants to cut back on his medications because he has heard about risks associated with tight control of diabetes. What study/studies of patients with type 2 diabetes is/are the basis of TU's concern?

    a. UK Prospective Diabetes Study (UKPDS, 1998) showing that the intensive group (A1C 7%) had 12% decrease in any diabetes-related endpoint.
    b. Stratton et al. prospective study of UKPDS (2000) showing incremental decrease in myocardial infarction and microvascular endpoints for each 1% decrease in A1C down to 5.5%.
    c. ADVANCE (2008) and ACCORD (2008) studies showing significantly increased mortality with intensive control.
    d. ADVANCE (2008) and ACCORD (2008) studies showing no reduction in risk of major macrovascular events with intensive control AND the ACCORD study showing significantly increased mortality with intensive control.

18. Which of the following responses would be most appropriate in response to TU's concern?

    a. His concern is warranted, and the target A1C for TU should be raised to 7.5%.
    b. Study results do not pertain to him because the target A1C values used in the studies were higher than current guidelines.
    c. "Tight control" defined by current guidelines has documented benefits in terms of microvascular and macrovascular risks, and his target is based on these guidelines, not the lower A1C targets used in these studies.
    d. "Tighter control" of the ADVANCE study (A1C < 6.5%) should definitely be used as TU's target A1C because of decreased microvascular events.

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19. BB is an overweight 55-year-old woman with type 2 diabetes, hypertension, and high cholesterol, who is admitted to the hospital to rule out a myocardial infarction. On admit, her fasting plasma glucose is 144 mg/dL and her A1C is 7.6%. Her home medications include metformin 1000 mg orally twice daily and glyburide 10 mg orally once daily. During the hospital stay, her oral medications are stopped, and she is prescribed basal-bolus insulin. Her hospitalization has been complicated by worsening renal function (SCr increased to 1.8 mg/dL) and edema. Which recommendation is most appropriate for BB's discharge?

    a. BB's metformin and glyburide should be restarted.
    b. BB's metformin and glyburide should not be restarted since her renal function has worsened.
    c. BB's metformin and glyburide should be restarted and basal insulin should be added since her A1C was greater than 7%.
    d. BB's metformin and glyburide should be restarted and a third oral agent, such as pioglitazone, should be added since her A1C was greater than 7%.