

Multiple Choice Questions (MCQs)

Items 1–75

Directions

Items 1–75 consist of a question or an incomplete statement followed by three, four or five lettered options. Your task is to select the one BEST lettered option that answers each item. After you have selected the one lettered option that BEST answers each item, completely blacken the corresponding lettered circle for that item on Section A of the answer sheet. Please use only a #2 soft lead pencil.

Complex Case Highlight (Items 1–10)

A 35-year-old African-American man presents to you for his annual “physical exam.” He has no significant complaints but is concerned because his older sister was just diagnosed with type 2 diabetes. His father also had type 2 diabetes and died at age 54 of a myocardial infarction. He has two sons age 10 and 12, both >120% of ideal weight for their height. He is 6’0” and weighs 210 lbs (BMI 27 kg/m²); blood pressure is 138/88 mm Hg.

Current lab results for this patient are as follows:

Total Cholesterol	210 mg/dL
Triglycerides	150 mg/dL
HDL-C	40 mg/dL
LDL-C	140 mg/dL
Glucose	96 mg/dL

■ Items 1–6

For each numbered laboratory result (1–6), (if confirmed by repeat testing), select the *one* lettered diagnosis for this patient’s problem (A, B, C, D) MOST likely associated with it. Each lettered diagnosis may be selected once, more than once, or not at all.

- (A) Impaired fasting glucose (IFG).
- (B) Impaired glucose tolerance (IGT).
- (C) Diabetes.
- (D) None of the above.

1. Fasting plasma glucose 120 mg/dL.
2. 2-hour plasma glucose 190 mg/dL.
3. Fasting plasma glucose 130 mg/dL.

■ Items 58–59

The pathophysiology of type 2 diabetes mellitus requires both insulin resistance and pancreatic β -cell dysfunction. The major targets for insulin are the liver, skeletal muscle, and adipose tissue.

58. Which *one* of the following statements is INCORRECT regarding insulin resistance in patients with type 2 diabetes mellitus?
- (A) The normal suppression of gluconeogenesis by insulin in the liver is impaired.
 - (B) The normal uptake of glucose by skeletal muscle is impaired.
 - (C) The normal glucose disposal, which includes glucose oxidation and glycogen synthesis, by skeletal muscle, is impaired.
 - (D) Excess free fatty acids (FFAs) impair β -cell function.
 - (E) The normal degradation of triglycerides into FFAs by adipose tissue is impaired.
59. Which *one* of the following is NOT a major factor in pancreatic β -cell dysfunction in patients with type 2 diabetes mellitus?
- (A) Environmental factors.
 - (B) Genetic factors.
 - (C) Lipotoxicity.
 - (D) Glucotoxicity.
 - (E) Insulin toxicity.
60. Which *one* of the following conditions depicted pictorially is NOT associated with type 2 diabetes mellitus?



(A)



(B)



(C)



(D)

Item 65**Answer E**

The current ADA guidelines suggest metformin should be started at the onset of therapy for all the reasons mentioned in this item.

- It improves insulin resistance in liver, decreasing gluconeogenesis and glycogenolysis. It has a high initial response rate, drops A1C ~ 2%. There is no initial weight gain and can have a modest initial weight loss.
- It is not associated with hypoglycemia when used alone or with TZD, exenatide, or DPP-4 Inhibitors.
- It has potential to delay or prevent type 2 diabetes mellitus and progression (DPP-2 trial), but its secondary failure is only modestly better than sulfonylureas (ADOPT trial).
- It decreases MIs 39% in the retrospective analysis in the UKPDS obese subgroup, it decreases advanced glycosylated end-products (AGEs), and improves endothelial dysfunction.
- Disadvantages – One must watch for:
 - GI side-effects on initiation, though titration up to maximal effective dose of 2 g/day over a month decreases the risk.
 - Delay initiation until Cr levels are proven stable using radiologic iodinated contrast media studies. This will reduce risk of lactic acidosis. Moreover, don't use if have significantly impaired hepatic function or cardiovascular compromise (CHF) or Cr >1.4 female, >1.5 male.
 - Blood levels of metformin increase in patients with Cr clearance <70 (age >70). Patients with Cr Clearance <40 is where most cases of lactic acidosis cases have occurred. Thus, clinical judgement must be used in patients age 70–80 (the age the product insert recommends stopping or not using metformin).

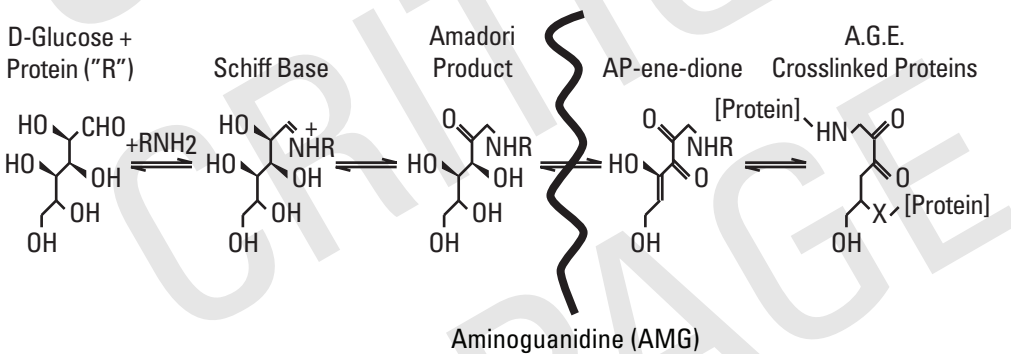


Figure 8. Advanced glycation end products.

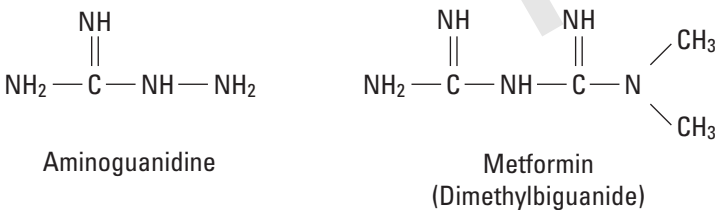


Figure 9. Guanidino compounds that bind dicarbonyls.