

**Harvard Medical School Department of
Continuing Education and the Cardiovascular
Division of the Department of Medicine,
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Cardiology Rounds
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Metabolic Therapy for Heart Failure

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Objectives:

The energy requirements of the heart are the greatest of any organ. The heart consumes and, indeed, must generate 6 kg of ATP daily, 15 to 20 times its own weight. This issue of *Cardiology Rounds* discusses the multiple substrates for energy generation in the heart. The reader will gain a better appreciation of basic myocardial energetics that will serve as a background for a greater understanding of new potential therapies for heart failure.

Questions: (Only one response is correct)

1. The organ with the highest energy requirements per weight is the:
 - a. brain
 - b. heart
 - c. kidney
 - d. skeletal muscle
 - e. skin

2. The heart is able to utilize the following substrates for energy synthesis:
 - a. carbohydrates
 - b. free fatty acids
 - c. triglycerides
 - d. ketones
 - e. All of the above

3. The predominant fuel in the adult heart for ATP synthesis is glucose.
True False

4. In experimental hearts with pressure and volume overload, there is a shift in substrate utilization towards glucose.
True False

5. Support for the concept that a shift to more myocardial glucose utilization may provide some compensatory advantage in cardiac hypertrophy comes from observations that mice with overexpressed GLUT1 not only have improved glucose utilization, but are also better able to tolerate a chronic pressure overload with less heart failure and improved survival.

True False

6. Pharmacologic compounds that shift cardiac substrate metabolism from fatty acids to carbohydrates (eg, ranolazine and trimetazidine) have been proven to reduce mortality and hospital admissions in heart failure patients.

True False

7. Although not approved for use in heart failure, insulin sensitizers that enhance glucose utilization by the myocardium are a rational choice for clinical testing.

True False

To receive AMA category 1 credit, you must correctly answer 60% of the test questions.

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Please keep a copy of your test before submission. A certificate will be sent upon successful completion of the test, along with the answer key, after the deadline date, as indicated.

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