Study Guide

Exercise Metabolism

Module 1- Energy Requirements from Rest to Recovery

Define the following terms:

- Oxygen deficit
- Oxygen debt
- EPOC

Study Questions

1. Explain how exercise challenges the energy systems.
2. Describe what typical resting oxygen consumption is.
3. How are resting energy needs met?
4. Describe what happens when one transitions from rest to exercise.
5. Explain the oxygen deficit in detail. Be able to explain this concept using the graph.
6. How would the oxygen deficit differ between trained and untrained subjects? Explain.
7. Explain the concept of EPOC. How is EPOC related to the oxygen deficit?
8. How does EPOC following moderate exercise compare with EPOC following heavy exercise? How do high intensity intervals impact EPOC?
9. What occurs during the slow and rapid portions of EPOC?
10. Explain all of the factors contributing to EPOC.
11. How is lactate removed following exercise?

Module 2- Metabolic Responses to Exercise

Define the following terms:

- Lactate threshold
- OBLA (Onset of Blood Lactate Accumulation)
- Incremental/graded exercise
- VO2max
- DOMS (Delayed Onset Muscle Soreness)
- RER (Respiratory Exchange Ratio)
- RQ (Respiratory Quotient)
- Upward drift

Study Questions

1. Describe how the energy systems operate during short-term, prolonged, and incremental exercise.
2. What causes an upward drift in oxygen consumption during exercise?
3. Define VO2 max.
4. What causes the lactate threshold? What is its significance? How would the LT be different in trained vs untrained subjects?
5. How is lactate related to muscle soreness (DOMS)?
6. How is fuel utilization estimated using RER?

Module 3- Factors Governing Fuel Selection

Define the following terms:

- Crossover concept

1. Explain how exercise intensity influences fuel utilization.
2. Explain how exercise duration influences fuel utilization.
3. Describe how carbohydrate and fat metabolism are interrelated.

Module 4- Fuel Sources within the Body

1. What are the 4 main sources of fuels found in the body? Describe their locations and how they are mobilized.
2. Using the graphs in the presentation, explain how exercise intensity influences selection of each of these fuel sources.
3. Using the graphs in the presentation, explain how exercise duration influences selection of each of these fuel sources.
4. Explain how/when proteins can be used for energy.
5. Discuss the action of the Cori Cycle.