

# Assessment of Exercise Tolerance for Development of Safe Exercise Prescription

## Part II: The Oxygen Transport System and Normal/Abnormal Responses to Exercise

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Note to Participants: There are interactive pop-up questions throughout this lecture. If you choose to pause the lecture and return at a later time, a natural break time would be after answering the interactive questions. (You are able to pause at any time and the presentation will “remember” where you were. It’s just a more natural time to pause after the interactive questions.) For your convenience, this outline reflects where/when within the lecture the interactive questions occur.

This lecture has 91 slides and is 143 minutes in duration.

- I. The components of the oxygen transport system
  - A. Ventilation
  - B. Diffusion
  - C. Circulation
  - D. Delivery of O<sub>2</sub> to muscle
- II. Measuring the TRUE maximum function of the O<sub>2</sub> transport system: maximal vO<sub>2</sub> testing
  - A. Maximal vO<sub>2</sub>
  - B. Cardiac output
    - 1. Normal cardiac output
    - 2. Stroke volume
  - C. Oxygen delivery
  - D. Arterial–venous oxygen difference in the muscle

Interactive Questions — slide 21 @ 31 minutes

- III. What should I monitor? How much should I monitor?
  - A. Heart rate responses
    - 1. Vs. oxygen consumption
    - 2. With increasing age
    - 3. Maximal heart rate
    - 4. What is the heart rate affected by?
    - 5. Case examples
    - 6. Training heart rate
    - 7. Abnormal heart rate responses
    - 8. Arrhythmias
  - B. Blood pressure
    - 1. Recommended treatment guidelines
      - a. BP management
      - b. Hypertension
      - c. Dark chocolate?
    - 2. What is blood pressure affected by?

Notes

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3. BP responses to activity
    - a. Normal
    - b. Abnormal
  4. BP monitoring recommendations
  5. Case examples

Notes

Interactive Questions — slide 53 @ 88 minutes

- C. Effects of medications
  1. Beta blockers
  2. Diuretics
  3. Calcium channel blockers
  4. Cardiac glycosides
  5. ACE inhibitors and ARBs
  6. Anti-depressants
  7. Nitrates
  8. Anti-arrhythmia meds
  9. Lipid-lowering drugs
- D. Other responses to assess
  1. Oxygen saturation (SpO<sub>2</sub>)
  2. Respiratory rate
  3. Symptoms
  4. Rating of perceived exertion

Interactive Questions — slide 69 @ 117 minutes

- IV. How do I monitor?
  - A. Monitoring in different settings
  - B. What monitoring equipment should I use?
  - C. Case example
  - D. Other considerations
    1. Arm vs. leg exercise
    2. Static vs. dynamic exercise
  - E. Effects of assistive devices
  - F. Importance of warming up and cooling down
  - G. Changes in blood lactate, post-exercise

Interactive Questions — slide 87 @ 141 minutes

- V. Why monitor?
    - A. Danger of untoward events in CVD
    - B. Clinical instability
    - C. Effects of PT interventions
      1. On healthy volunteers
      2. In patient/client groups
    - D. Documentation
    - E. Case example
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