Courtney Jensen | March 23, 2013 | Case Study Revision

What cardiovascular risk factors does she have?

Does she have major signs suggestive of disease? If so, please list.

What risk category is she based on your findings?

Is a medical examination necessary prior to testing and exercise participation? Why?

Is physician clearance needed prior to enrollment into your research study? Why?

Summarize the health/fitness assessment results as they will serve as the basis for the exercise prescription that you will design for her.

What are her “special conditions/considerations”?

What other healthcare professionals should you consult when designing her exercise prescription?

Formulate her FITT-VP exercise prescription including special considerations.

**1) What cardiovascular risk factors does she have?**

|  |  |  |
| --- | --- | --- |
| **CVD risk factors**  | **Case study** | **Results** |
| **Age:** men ≥45 yr; women ≥55 yr | Woman, 50 yr | No |
| **Family history:** Cardiac history before 55 yr in father or first-degree male relative or before 65 yr in mother or first-degree female relative | Not described/unknown | Positive risk |
| **Cigarette smoking**: current smoker, quit within last 6m, or environmental exposure | Described as a smoker | Positive risk |
| **Sedentary lifestyle**: not participating in at least 30 m of mod. intensity PA (40-60% VO2R) on at least 3d/wk for at least 3 m | Described as sedentary | Positive risk |
| **Obesity**: BMI is ≥30 kg/m2 or WC is greater than 88cm (among women)  | BMI ranges from 26.1 kg/m2 to 26.4 kg/m2, WC is 84 cm | No |
| **Hypertension:** SBP ≥140 mmHg and/or DBP ≥ 90 mmHg or on antihypertensive medication  | Blood pressure ranges from 126/74 to 138/80 mmHg | No |
| **Dyslipidemia:** LDL cholesterol ≥ 130mg/dL or HDL cholesterol < 40mg/dL or on lipid-lowering medication, or ≥200 mg/dL total cholesterol if that is all that is available | Triglycerides: 148 mg/dL, HDL: 76 mg/dL,LDL: 83 mg/dL,Total cholesterol: 190 mg/dL | No |
| **Prediabetes:** fasting plasma glucose ≥ 100 mg/dL but ≤ 125 mg/dL, or 2 h values in oral glucose tolerance test ≥ 140 mg/dL but ≤ 199 mg/dL, confirmed on at least 2 occasions | Diagnosed with type II diabetes mellitus in 1996. Metabolic disease, not a risk factor. | No |
| **Negative Risk factors**  |  |
| HDL cholesterol ≥ 60 mg/dL | HDL: 76 mg/dL | Negative risk |

There are 3 positive CVD risk factors (implied family history, cigarette smoking, and sedentary lifestyle) and 1 negative risk factor (HDL ≥ 60 mg/dL). **Net sum = 2 CVD risk factors.**

**2) Does she have major signs suggestive of disease? If so, please list. Yes.** The subject has HIV, asthma, type 2 diabetes mellitus, and substance use disorder.

**3) What risk category is she based on your findings? The subject is classified as high risk.** Criteria for classification found in *Figure 2.3 (GETP9,* pg. 26*).*

**4) Is a medical examination necessary prior to testing and exercise participation? Why?**

**Yes.** As illustrated in Figure 2.4 (*GETP9,* pg. 28*)*, **a medical exam is necessary due to the subject’s high risk classification.** Health risks may be exacerbated by acute exercise, especially among previously sedentary patients who are initiating an exercise program (*GETP9*, pg. 31; Cobb & Weaver, 1986; JACC, 7: 215-219). Because this HAPI patient will be transitioning from a sedentary lifestyle, she may be predisposed to an elevated risk of cardiovascular events. Moreover, the information gathered during the medical exam may also be useful when subsequently designing her ExRx (*GETP9*, pg. 32).

**5) Is physician clearance needed prior to enrollment into your research study? Why?**

**Yes.** All subjects enrolling in HAPI are classified as high risk and, depending on randomization, enrollment may involve routine participation in an exercise/PA program. This particular subject is unaccustomed to PA and has known metabolic and pulmonary diseases in addition to diagnoses of HIV and substance use disorder. The transition from a sedentary lifestyle to one marked by habitual exercise and PA carries health risks. Additionally, physician clearance prior to enrollment is a proper step in the management of liability (*GETP9*, pg. 33).

**6) Summarize the health/fitness assessment results as they will serve as the basis for the exercise prescription that you will design for her.**

|  |  |  |
| --- | --- | --- |
| **VARIABLE** | **SCORE** | **CLASSIFICATION** |
| Resting heart rate | 113 bpm | Very poor1 |
| Sit-and-reach | 29.5 cm | Very good2 |
| Handgrip strength | 70 kg | Above average3 |
| Floor transfer test | 3.66 s | Better than comparison population4 |
| YMCA Cycle Ergometer test | 21.0 ml/kg/min | Between poor and very poor2 |

1. Golding et al. (1989). 2. *GETP9, 2013*. 3. *Canadian Physical Activity, Fitness & Lifestyle* *Approach* manual, 3rd edition. 4. Wang et al., 2005.

**7) What are her “special conditions/considerations”?** Due to HIV, her health and exercise capacity is likely to vary more than non-pathological populations. This variability should be monitored. Minor increases in fatigue or shortness of breath should not preclude participation, but dizziness, swollen joints or vomiting should. The mode of exercise (and testing) should also be appropriate to her capacities while minimizing disease transmission (i.e., no contact sports) (*GETP9*, pgs. 293-295). Due to her type 2 DM, blood sugar should be taken regularly. Abnormal readings found prior to PA should preclude participation until resolved. Signs for hypoglycemia (<70 mg/dL) should be monitored as well (shakiness, hunger, headache, visual disturbances, etc.). Exercise timing, carbohydrate intake, and insulin dosing should also be monitored to prevent hypoglycemia during and following exercise (*GETP9,* pgs. 278-284). Regarding her arthritis, if she experiences an acute flare up, strenuous exercise and exercise testing should be postponed until it subsides. Exercise should be conducted during the time of day when pain is least severe and the mode prescribed should reflect that which is best tolerated, incorporating functional exercises where possible. Proper footwear should be worn and adequate warm-up and cool-down periods (5-10 min) should be provided (*GETP9*, pgs. 261-263). Regarding asthma, her inhaler should be used prophylactically to prevent exercise-induced bronchoconstriction. If her asthma is acutely symptomatic, exercise should not be conducted until airway function has improved. The exercise environment should also be considered, actively avoiding pollutants, pollens, cold air, etc. (*GETP9*, pgs. 332-334). Regarding her medical profile, 7 pharmacological agents were listed. Among those she regularly uses are Reyataz, Norvir, Truvada (antiretroviral agents), Ventolin (bronchodilator), and Novolog (anti-diabetic). The antiretroviral agents commonly induce fatigue, myalgia, nausea, diarrhea, and abdominal pain while elevating CVD risk. Norvir specifically may elevate serum cholesterol by 31% to 65% and induce hyperglycemia. Her bronchodilator may cause nausea (10% incidence) and can elevate the risk of atrial fibrillation, myocardial infarction, and diabetic ketoacidosis (*Micromedex*, 2013).

**8) What other healthcare professionals should you consult when designing her exercise prescription?** Her case manager at Connections, primary care physician, and HIV specialist (if she has one) should be included. Her case manager may know personal details affecting exercise capacity/performance (e.g., “I haven’t been sleeping well”, “I used drugs twice last week”). Her primary care physician and/or HIV specialist may have medical information (e.g., “her CD4+ count is at 350”) which would help weigh the risks verses benefits of exercise engagement.

**9) Formulate her FITT-VP exercise prescription including special considerations.** This patient has HIV, substance use disorder, type 2 DM, and arthritis. She smokes, she’s overweight, and she leads a sedentary lifestyle. Having fallen down a flight of stairs 17 months ago, it’s possible she has lasting musculoskeletal injuries. In addition to having a history of crack cocaine use, she takes 7 pharmacological agents to treat her various diseases and disabilities. She has prehypertension but has a favorable lipid profile. Her VO2 and RHR suggest poor cardiopulmonary fitness, while her grip strength and floor transfer test suggest above average strength and physical functioning. Lastly, her sit-and-reach score suggests good flexibility. Based on the advice on page 344 of *GETP9*, I’ve chosen to base her FITT-VP on the disease that confers the greatest risk (type 2 DM) while incorporating other major diseases/health conditions that may be very limiting to her participation in exercise (HIV and arthritis).

The FITT-VP provided for DM (*GETP9*, pgs. 281-282) will serve as the foundation of this ExRx: **Frequency:** 3–7 days a week. **Intensity:** 40%–<60% VO2R. **Time:** periodic bouts of at least 10 min totaling at least 150 min a week. **Type:** activities and exercise that recruit large muscle groups in a rhythmic and continuous fashion.

**Considerations:** Improvement of cardiopulmonary health will be a primary goal considering her strength and physical functioning already appear adequate while her VO2 and RHR indicate very poor cardiopulmonary health. However, due to the prevalence of muscle wasting and osteopenia among people with HIV, RE will be included as a maintenance/prophylactic measure. The RE prescription will follow the recommendations for HIV provided on pgs. 294-295 (60% 1-RM for 8-10 repetitions per set, 2-3 sets per exercise over 30 min). She already exhibits good flexibility, so the guidelines for healthy adults will be suggested (2-3 days/week, holding each stretch 30-60 s; details provided in Table 7.7 on page 188). However, the flexibility guidelines will not be suggested at the *expense* of her focus on cardiopulmonary improvement. If time spent stretching would detract from time spent in aerobic exercise, the latter will be stressed while the former is only encouraged. The type of activities chosen for exercise will reflect not only her capacities (and no activities where bleeding may be likely), but also her interests.

**Progression:** As the subject is capable, the time component will be gradually increased to ≥300 min a week (of moderate-to-vigorous PA) to accrue additional benefits to diabetic control. Glucose may also be better controlled via higher intensities (≥60% VO2R). If the subject’s HIV symptoms permit this level of intensity, and it does not exacerbate her arthritis, this will be considered for the future progression. However, as indicated in *GETP9* (pg. 31) physically unfit individuals should begin with light to moderate intensity and progress only as fitness improves.