Reviewer's report

Title: Cardiovascular Fitness Predicts Cognitive Performance in Heart Failure Patients Enrolled in Cardiac Rehabilitation

Version: 1 Date: 28 January 2013

Reviewer: Jenna Scisco

Reviewer's report:

Summary: The purpose of this study was to determine if cardiovascular fitness is an independent predictor of cognitive performance in heart failure patients. Cardiovascular fitness was assessed with a maximal stress test, with METs as the outcome. A two-minute step test (2MST) and the Duke Activity Status Index (DASI) were used as "office-based" estimates of cardiovascular fitness. Cognitive performance was assessed with a comprehensive battery of cognitive tests. Overall, better cardiovascular fitness (defined as METs) was associated with better performance on attention, executive control, and memory tasks, but not language tasks. Additionally, METs and the 2MST were positively correlated, and positive relationships were found between 2MST, attention, and executive function. However, DASI scores were not associated with METs or cognitive function. The overall conclusions that can be made from this study are: (1) cardiovascular fitness as assessed with a stress test is related to cognitive performance in heart failure patients, and (2) the 2MST may also be an acceptable measure of cardiovascular fitness, and perhaps cognitive functioning, in a clinical setting.

Please consider the following revisions:

Major Compulsory Revisions

1. The abstract and introduction state that cardiovascular fitness has not been investigated as a predictor of cognitive function in heart failure patients. However, a recent report cited by the authors (reference 25, Alosco et al. 2011) reports that the 2MST, a measure of cardiovascular fitness, is associated with cognitive performance in heart failure patients. The authors should clarify these portions of the abstract and background sections and describe why examining METs as a predictor of cognitive function is an important/unique step in this line of research. Please describe how the findings reported in this manuscript differ from those in Alosco et al. 2011.

2. In the discussion section, it becomes clear that the DASI and the 2MST were included in the paper to examine if office-based measures used by clinicians could indicate possible decreased cardiovascular fitness and, thus, cognitive performance, in heart failure patients. This is not clear in the background section, which states that these tests were also examined as possible correlates of cognitive performance. The background section should include a brief discussion
of the differences between the METs measure and the office-based measures, and why all three measures of fitness were examined in the current study.

Minor Essential Revisions

1. Page 4, line 2 – missing the word “to” in “would be correlated cognitive performance”.

2. In the participants section, the descriptions of age, gender, race, LVEF are redundant with Table 1 and can be removed.

3. For all Neuropsychological Tests, a brief description of the validity of the tests or the use of the tests with this population in past research would be helpful. If the information is not available, please provide a brief description of why the tasks were selected for the present study.

4. Page 5 – the description of the Stroop task, “and then the color words are printed in when the word and the color does not match” is somewhat confusing. Please provide a clearer description of the Stroop task.

5. Page 6 – The BDI-II is stated to have “good psychometric properties”. Can a more detailed description of those properties be provided?

6. Page 7 – Please provide a citation for the T-score transformation method.

7. Page 8 – “See Table 1” – should this be referring to Table 2?

8. Page 10 – “but also ultimately reduce medical costs in HF.” A brief justification for how a structured exercise program could reduce medical costs is needed.

9. Page 10 – Some support for the idea that the HF cognitive impairment was so severe that it could have an effect on responses to the DASI is needed. Are there other reasons why the self-report could be inaccurate? (For example, a desire to appear more functional than one actually is?)

Level of interest: An article whose findings are important to those with closely related research interests

Quality of written English: Acceptable

Statistical review: No, the manuscript does not need to be seen by a statistician.

Declaration of competing interests:

I declare that I have no competing interests.