Broadening Evaluation of Physical Function to Enhance Risk Evaluation for Heart Failure Patients Initiating Cardiac Rehabilitation

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Acknowledgements

• This work was supported by a Veterans Affair Office of Rural Health “Promising Practice Home-Based Cardiac Rehabilitation Program.”

• The contents do not represent the views of the US Department of Veterans Affairs or the United States Government.

• No Disclosures
Introduction

• Heart failure (HF) has recently been added as an eligible diagnosis for cardiac rehabilitation (CR).

• Current AACVPR risk stratification (RS) guidelines rely exclusively on disease-centered metrics and current signs and symptoms.
  • These measures are routinely used to guide exercise prescription for patients.

• Patients with HF often have reduced cardiorespiratory fitness but vary considerably in their functional capabilities (e.g., balance, endurance, power and mobility).
AACVPR Risk Stratification

Chart 6. AACVPR criteria for risk stratification in patients with low, moderate and high risk of events during the year.

**Low Risk**
- Absence of complex ventricular dysrhythmia during exercise testing and recovery
- Absence of angina or other significant symptoms (e.g., unusual shortness of breath, light-headedness, or dizziness) heart rate and systolic blood pressure with increasing workloads and recovery
- Presence of normal hemodynamics during exercise testing and recovery (i.e., appropriate increases and decreases in heart rate and systolic blood pressure with increasing workloads and recovery)
- Functional capacity ≥ 7 METs

**Nonexercise testing findings**
- EF ≥ 50% at rest
- Uncomplicated MI or revascularization procedure
- Absence of complicated ventricular arrhythmias at rest
- Absence of CHF
- Absence of signs or symptoms of post-event or post-procedure ischemia
- Absence of clinical depression

**Moderate Risk**
- Presence of angina or other significant symptoms (e.g., unusual shortness of breath, light-headedness, or dizziness occurring only at high levels of exertion (<7 METs))
- Mild to moderate level of silent ischemia during exercise testing or recovery (ST-segment depression < 2 mm from baseline)
- Function capacity < 5 METs

**Nonexercise testing findings**
- EF = 40% to 40% at rest

**High Risk**
- Presence of complex ventricular arrhythmias during exercise testing or recovery
- Presence of angina or other significant symptoms (e.g., unusual shortness of breath, light-headedness, or dizziness at low levels of exertion ≤ 5 METs) or during recovery
- High level of silent ischemia (ST-segment depression ≥ 2 mm from baseline) during exercise testing or recovery
- Presence of abnormal hemodynamics with exercise testing (i.e., chronotropic incompetence or flat or decreasing systolic BP with increasing workloads) or recovery (i.e., severe postexercise hypotension)

**Nonexercise testing findings**
- EF < 40% at rest
- History of cardiac arrest or sudden death
- Complex dysrhythmias at rest
- Complicated MI or revascularization procedure
- Presence of CHF
- Absence of signs or symptoms of postevent or postprocedure ischemia
- Absence of clinical depression

METs: Metabolic Equivalent; EF: Ejection Fraction; MI: Myocardial Infarction; CHF: Congestive Heart Failure; BP: Blood Pressure
Purpose

• HF care has advanced to achieve relatively greater cardiac stability
  • Patients have greater risks attributable to non-disease domains because they have typically become older and more complex (e.g., disability, frailty, falls).
  • Expanded domains in RS are timely and impactful, especially as the application of CR is emphasized as a priority of care.

• Our novel assessment of functional risk responds to contemporary patient-based challenges.

• To enhance exercise prescription of HF patients enrolling into CR, we broadened RS to include functional risk in addition to traditional disease-based AACVPR RS.
Design

- A retrospective quality improvement project.

- All patients enrolling into Phase II CR with a diagnosis of HF were assessed using both traditional AACVPR RS as well as our novel expanded functional RS.
  - 6 minute-walk-test (6MWT), gait speed (GS), timed up-and-go (TUG), hand grip (HG), and tandem stand (TS).
Results

- 73 HF patients were assessed.
- Based on AACVPR RS criteria, 32 and 41 patients were classified as moderate and high risk respectively.
- AACVPR risk was “concordant” with functional risk in only 25/73 patients

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<th>AACVPR Risk</th>
<th>Functional Risk</th>
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Conclusion

• We established that there were differences between the disease- and functional RS in HF patients enrolling in CR.

• Our data suggest that functional risk enhances RS, and provides useful added perspective for exercise prescription for HF patients.

• Our findings also implicitly highlight the value of a multidisciplinary team to assess and interpret aggregate risk for patients who are increasingly complex.