**Performance Measure for Improvement in Functional Capacity at Completion of Cardiac Rehabilitation (CR)**

**MEASURE DESCRIPTION:**

The percentage of patients who increase their functional capacity after participation in CR as measured by one of the following assessments: (1) symptom-limited graded exercise testing (increase in METs by at least 15%), (2) estimated exercise session peak METs (increase in METs by at least 40%) or (3) six minute walk test (6MWT) distance (increase in distance walked by at least 10%).

**DEFINITIONS:**

Assessment of functional capacity during CR may be performed in three ways:

1. Symptom-limited graded exercise testing with or without analysis of expired air is the gold standard measurement, performed at program entry and exit  
   - Use procedures contained in the current guidelines published by the American College of Sports Medicine
2. Estimation of peak exercise intensity in METs during the beginning of the CR program (defined as the third session to account for learning effect) and during the final exercise training session  
   - Use equations published by the American College of Sports Medicine
   - Estimate METs only using exercise devices which can be calibrated. Factory calibrated equipment may be used as long as the identical piece of equipment is used for pre and post measurement.
3. Six-minute walk test (6MWT) distance performed at program entry and exit  
   - Follow the procedures of the American Thoracic Society

**NUMERATOR:**

Number of patients who increase their functional capacity by the percent specified in the measure description from the beginning to the completion of their CR program, as measured by either symptom-limited graded exercise testing, estimated exercise peak METs, or 6MWT distance.  
(Refer to the Definitions section for details about measuring functional capacity.)

**DENOMINATOR:**

Number of patients who completed CR during the measurement period. A patient is defined as having completed CR if he/she has completed a minimum of four weeks of the CR program and has undergone a final, formal discharge assessment session and updated treatment plan.

*Denominator Exclusions*

Patients unable to participate in a 6MWT, a graded exercise test, or unable to use an exercise device that can be calibrated to estimate METs, due to physical, cognitive, neurological, psychological, or safety reasons or patients who have not completed 4 weeks of CR.
PERIOD OF ASSESSMENT:
Up to twelve months

ATTRIBUTION:
CR program staff

SOURCES OF DATA:
Medical record or other database (e.g., administrative, clinical, registry)

RATIONALE:
Of all of the clinical factors that predict survival in patients with cardiovascular disease, aerobic exercise capacity and the improvement in functional capacity as a result of exercise training are among the most powerful. It has been determined that for each 1 ml/kg/min increase in VO2peak, cardiovascular mortality is reduced by approximately 10%.3,4 For each 1 MET increase in functional capacity resulting from CR, all-cause mortality is reduced by 25% at one year.5 For each increase in six-minute walk distance of 104m, risk of myocardial infarction and all-cause mortality decreases by 47% and 55%, respectively.6 Finally, for each 1 MET increase in final CR submaximal exercise intensity during training sessions, all-cause mortality is reduced by 34%.7

Average increase in estimated functional capacity from graded exercise testing after CR is approximately one MET,5 with an average percent increase of 25%.8,9,10 The average increase in submaximal exercise capacity during CR exercise sessions is approximately 3 METs, with an average percent increase of 77%.7 Mean increase in six-minute walk distance after CR ranges from 15% to 19% or 59 to 75 meters,11,12,13 with the minimal clinically important difference varying across clinical populations and ranging from 25 to 32 meters.14,15

In developing this performance measure, the committee recognizes that there is a broad distribution of functional capacity among individuals entering CR and tremendous variability in the ability of CR participants to increase their functional capacity with CR. Improvements in functional capacity, even if below the average improvement observed in the population, can be beneficial to individual participants and associated with improved outcomes, especially for those individuals with very low baseline functional capacity.16 As a result, the committee recognizes that not all CR participants will be able to achieve the average absolute or percent increases in functional capacity with CR quoted above and has defined the threshold for improvement to achieve this performance measure accordingly.

REFERENCES:


