**National Quality Forum—Evidence (subcriterion 1a)**

**Measure Number** (*if previously endorsed*)**:** 0642

**Measure Title**: Cardiac Rehabilitation Patient Referral From an Inpatient Setting

**IF the measure is a component in a composite performance measure, provide the title of the Composite Measure here:** Click here to enter composite measure #/ title

**Date of Submission**: 11/8/2017

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| **Instructions**  *Complete 1a.1 and 1a.2 for all measures. If instrument-based measure, complete 1a.3.*  *Complete* ***EITHER 1a.2, 1a.3 or 1a.4*** *as applicable for the type of measure and evidence.*  *For composite performance measures:*  *A separate evidence form is required for each component measure unless several components were studied together.*  *If a component measure is submitted as an individual performance measure, attach the evidence form to the individual measure submission.*   * All information needed to demonstrate meeting the evidence subcriterion (1a) must be in this form. An appendix of *supplemental* materials may be submitted, but there is no guarantee it will be reviewed. * If you are unable to check a box, please highlight or shade the box for your response. * Contact NQF staff regarding questions. Check for resources at [Submitting Standards webpage](http://www.qualityforum.org/Measuring_Performance/Submitting_Standards.aspx). |

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| **Note: The information provided in this form is intended to aid the Standing Committee and other stakeholders in understanding to what degree the evidence for this measure meets NQF’s evaluation criteria.**   1a. Evidence to Support the Measure Focus The measure focus is evidence-based, demonstrated as follows:   * Outcome: [**3**](#Note3) Empirical data demonstrate a relationship between the outcome and at least one healthcare structure, process, intervention, or service. If not available, wide variation in performance can be used as evidence, assuming the data are from a robust number of providers and results are not subject to systematic bias. * Intermediate clinical outcome: a systematic assessment and grading of the quantity, quality, and consistency of the body of evidence [**4**](#Note4)that the measured intermediate clinical outcome leads to a desired health outcome. * Process: [**5**](#Note5) a systematic assessment and grading of the quantity, quality, and consistency of the body of evidence [**4**](#Note4) that the measured process leads to a desired health outcome. * Structure: a systematic assessment and grading of the quantity, quality, and consistency of the body of evidence [**4**](#Note4) that the measured structure leads to a desired health outcome. * Efficiency: [**6**](#Note6) evidence not required for the resource use component. * For measures derived from patient reports, evidence should demonstrate that the target population values the measured outcome, process, or structure and finds it meaningful. * Process measures incorporating Appropriate Use Criteria: See NQF’s guidance for evidence for measures, in general; guidance for measures specifically based on clinical practice guidelines apply as well.   **Notes**  **3.** Generally, rare event outcomes do not provide adequate information for improvement or discrimination; however, serious reportable events that are compared to zero are appropriate outcomes for public reporting and quality improvement.  **4.** The preferred systems for grading the evidence are the Grading of Recommendations, Assessment, Development and Evaluation [(GRADE) guidelines](http://www.gradeworkinggroup.org) and/or modified GRADE.  **5.** Clinical care processes typically include multiple steps: assess → identify problem/potential problem → choose/plan intervention (with patient input) → provide intervention → evaluate impact on health status. If the measure focus is one step in such a multistep process, the step with the strongest evidence for the link to the desired outcome should be selected as the focus of measurement. Note: A measure focused only on collecting PROM data is not a PRO-PM.  **6.** Measures of efficiency combine the concepts of resource use and quality (see NQF’s [Measurement Framework: Evaluating Efficiency Across Episodes of Care](http://www.qualityforum.org/Publications/2010/01/Measurement_Framework__Evaluating_Efficiency_Across_Patient-Focused_Episodes_of_Care.aspx); [AQA Principles of Efficiency Measures](http://www.aqaalliance.org/files/PrinciplesofEfficiencyMeasurementApril2006.doc)). |

**1a.1.This is a measure of**: (*should be consistent with type of measure entered in De.1*)

Outcome

Outcome: Click here to name the health outcome

Patient-reported outcome (PRO): Click here to name the PRO

*PROs include HRQoL/functional status, symptom/symptom burden, experience with care, health-related behaviors.* (*A PRO-based performance measure is not a survey instrument. Data may be collected using a survey instrument to construct a PRO measure.)*

Intermediate clinical outcome (*e.g., lab value*): Click here to name the intermediate outcome

Process: Click here to name what is being measured

Appropriate use measure: Click here to name what is being measured

Structure: Click here to name the structure

Composite: Click here to name what is being measured

**1a.2** **LOGIC MODEL** Diagram or briefly describe the steps between the healthcare structures and processes (e.g., interventions, or services) and the patient’s health outcome(s). The relationships in the diagram should be easily understood by general, non-technical audiences. Indicate the structure, process or outcome being measured.

Re

Re Referral to Cardiac Rehabilitation

En Enrollment/Participation in Cardiac Rehabilitation

Outcomes:

Lower Mortality/Morbidity

Hi Higher Quality of Life

R Risk Factor Modification

Improved Function & Exercise Capability

I Improved Medication Adherence

Reduction in Re-Hospitalization rates

Cost Effective Care

**1a.3** **Value and Meaningfulness:**  **IF** this measure is derived from patient report, provide evidence that the target population values the measured ***outcome, process, or structure*** and finds it meaningful. (Describe how and from whom their input was obtained.)

**\*\*RESPOND TO ONLY ONE SECTION BELOW -EITHER 1a.2, 1a.3 or 1a.4) \*\***

**1a.2** **FOR OUTCOME MEASURES including PATIENT REPORTED OUTCOMES - Provide empirical data demonstrating the relationship between the outcome (or PRO) to at least one healthcare structure, process, intervention, or service.**

**1a.3.****SYSTEMATIC REVIEW(SR) OF THE EVIDENCE (for intermediate outcome, PROCESS, or STRUCTURE PERFORMANCE measures, including those that are instrument-based) If the evidence is not based on a systematic review go to section 1a.4) If you wish to include more than one systematic review, add additional tables.**

**What is the source of the systematic review of the body of evidence that supports the performance measure? A systematic review is a scientific investigation that focuses on a specific question and uses explicit, prespecified scientific methods to identify, select, assess, and summarize the findings of similar but separate studies. It may include a quantitative synthesis (meta-analysis), depending on the available data. (IOM)**

X☐ Clinical Practice Guideline recommendation (with evidence review)

☐ US Preventive Services Task Force Recommendation

X☐ Other systematic review and grading of the body of evidence (*e.g., Cochrane Collaboration, AHRQ Evidence Practice Center*)

☐ Other

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| **Source of Systematic Review:**   * **Title** * **Author** * **Date** * **Citation, including page number** * **URL** | Coronary Artery Bypass Surgery (CABG):Hillis LD, et. Al. 2011 ACCF/AHA guideline for coronary artery bypass graft surgery: a report of the American College of Cardiology Foundation/American Heart Association Task Force on Practice Guidelines. *Circulation*. 2011;124:e652– e735.  http://circ.ahajournals.org/content/124/23/e652.full.pdf+html |
| Quote the guideline or recommendation verbatim about the process, structure or intermediate outcome being measured. If not a guideline, summarize the conclusions from the SR. | Pages e683-684: 4.9. Cardiac Rehabilitation:  Cardiac rehabilitation is recommended for all eligible patients after CABG. |
| Grade assigned to the **evidence** associated with the recommendation with the definition of the grade | NA |
| Provide all other grades and definitions from the evidence grading system | NA |
| Grade assigned to the **recommendation** with definition of the grade | Cardiac rehabilitation is recommended for all eligible patients after CABG.  Recommendation Class I; Level of Evidence: A |
| Provide all other grades and definitions from the recommendation grading system | See Table 1 below. |
| Body of evidence:   * Quantity – how many studies? * Quality – what type of studies? | NA |
| Estimates of benefit and consistency across studies | NA |
| What harms were identified? | NA |
| Identify any new studies conducted since the SR. Do the new studies change the conclusions from the SR? | NA |

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| **Source of Systematic Review:**   * **Title** * **Author** * **Date** * **Citation, including page number** * **URL** | Percutaneous Coronary Intervention (PCI): Levine GN, et. Al.2011 ACCF/AHA/SCAI guideline for percutaneous coronary intervention: a report of the American College of Cardiology Foundation/American Heart Association Task Force on Practice Guidelines and the Society for Cardiovascular Angiography and Interventions. *J Am Coll Cardiol* 2011;58:e44–122.  http://content.onlinejacc.org/article.aspx?articleid=1147816 l |
| Quote the guideline or recommendation verbatim about the process, structure or intermediate outcome being measured. If not a guideline, summarize the conclusions from the SR. | Page e89: 6.4.3. Cardiac Rehabilitation: Recommendation  Medically supervised exercise programs (cardiac rehabilitation) should be recommended to patients after PCI, particularly for moderate- to high-risk patients for whom supervised exercise training is warranted. |
| Grade assigned to the **evidence** associated with the recommendation with the definition of the grade | NA |
| Provide all other grades and definitions from the evidence grading system | NA |
| Grade assigned to the **recommendation** with definition of the grade | Medically supervised exercise programs (cardiac rehabilitation) should be recommended to patients after PCI, particularly for moderate- to high-risk patients for whom supervised exercise training is warranted.  Recommendation Class I; Level of Evidence: A |
| Provide all other grades and definitions from the recommendation grading system | See Table 1 below. |
| Body of evidence:   * Quantity – how many studies? * Quality – what type of studies? | NA |
| Estimates of benefit and consistency across studies | NA |
| What harms were identified? | NA |
| Identify any new studies conducted since the SR. Do the new studies change the conclusions from the SR? | NA |

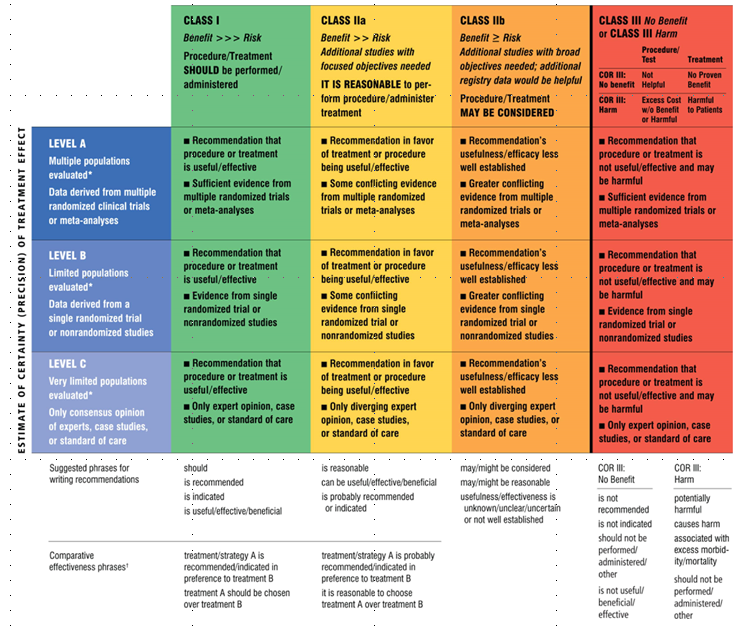
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| **Source of Systematic Review:**   * **Title** * **Author** * **Date** * **Citation, including page number** * **URL** | Coronary Artery Disease (CAD): Smith SC Jr., et. Al.AHA/ACCF secondary prevention and risk reduction therapy for patients with coronary and other atherosclerotic vascular disease: 2011 update: a guideline from the American Heart Association and American College of Cardiology Foundation. *Circulation*. 2011: published online before print November 3, 2011, 10.1161/CIR.0b013e318235eb4d.  http://content.onlinejacc.org/article.aspx?articleid=1147807 |
| Quote the guideline or recommendation verbatim about the process, structure or intermediate outcome being measured. If not a guideline, summarize the conclusions from the SR. | Page 2436  1. All eligible patients with ACS or whose status is immediately post coronary artery bypass surgery or post-PCI should be referred to a comprehensive outpatient cardiovascular rehabilitation program either prior to hospital discharge or during the first follow-up office visit.  2. All eligible outpatients with the diagnosis of ACS, coronary artery bypass surgery or PCI, chronic angina… within the past year should be referred to a comprehensive outpatient cardiovascular rehabilitation program.  3. A home-based cardiac rehabilitation program can be substituted for a supervised, center-based program for low-risk patients. |
| Grade assigned to the **evidence** associated with the recommendation with the definition of the grade | NA |
| Provide all other grades and definitions from the evidence grading system | NA |
| Grade assigned to the **recommendation** with definition of the grade | All eligible patients with ACS or whose status is immediately post coronary artery bypass surgery or post-PCI should be referred to a comprehensive outpatient cardiovascular rehabilitation program either prior to hospital discharge or during the first follow-up office visit.  Recommendation Class I; Level of Evidence: A  All eligible outpatients with the diagnosis of ACS, coronary artery bypass surgery or PCI, chronic angina, and/or peripheral artery disease within the past year should be referred to a comprehensive outpatient cardiovascular rehabilitation program.  PCI: Recommendation Class I; Level of Evidence: A  Chronic Angina: Recommendation Class I; Level of Evidence: B  A home-based cardiac rehabilitation program can be substituted for a supervised, center-based program for low-risk patients.  Recommendation Class I; Level of Evidence: A |
| Provide all other grades and definitions from the recommendation grading system | See Table 1 below. |
| Body of evidence:   * Quantity – how many studies? * Quality – what type of studies? | NA |
| Estimates of benefit and consistency across studies | NA |
| What harms were identified? | NA |
| Identify any new studies conducted since the SR. Do the new studies change the conclusions from the SR? | NA |

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| **Source of Systematic Review:**   * **Title** * **Author** * **Date** * **Citation, including page number** * **URL** | ST Elevation Myocardial Infarction (STEMI): O’Gara PT, et. Al. 2013 ACCF/AHA guideline for the management of ST-elevation myocardial infarction: a report of the American College of Cardiology Foundation/American Heart Association Task Force on Practice Guidelines. J Am Coll Cardiol 2013; 61:e78 –140, doi:10.1016/j.jacc.2012.11.019.  http://content.onlinejacc.org/article.aspx?articleid=1486115 |
| Quote the guideline or recommendation verbatim about the process, structure or intermediate outcome being measured. If not a guideline, summarize the conclusions from the SR. | e114-116: 11.1. Post hospitalization Plan of Care:  Recommendations  1. Post hospital systems of care designed to prevent hospital readmissions should be used to facilitate the transition to effective, coordinated outpatient care for all patients with STEMI.  2. Exercise-based cardiac rehabilitation/secondary prevention programs are recommended for patients with STEMI.  3. A clear, detailed, and evidence-based plan of care that promotes medication adherence, timely follow- up with the healthcare team, appropriate dietary and physical activities, and compliance with interventions for secondary prevention should be provided to patients with STEMI |
| Grade assigned to the **evidence** associated with the recommendation with the definition of the grade | NA |
| Provide all other grades and definitions from the evidence grading system | NA |
| Grade assigned to the **recommendation** with definition of the grade | Post-hospital systems of care designed to prevent hospital readmissions should be used to facilitate the transition to effective, coordinated outpatient care for all patients with STEMI.  Recommendation Class I; Level of Evidence: B  Exercise-based cardiac rehabilitation/secondary prevention programs are recommended for patients with STEMI.  Recommendation Class I; Level of Evidence: B  A clear, detailed, and evidence-based plan of care that promotes medication adherence, timely follow-up with the healthcare team, appropriate dietary and physical activities, and compliance with interventions for secondary prevention should be provided to patients with STEMI.  Recommendation Class I; Level of Evidence: C |
| Provide all other grades and definitions from the recommendation grading system | See Table 1 below. |
| Body of evidence:   * Quantity – how many studies? * Quality – what type of studies? | NA |
| Estimates of benefit and consistency across studies | NA |
| What harms were identified? | NA |
| Identify any new studies conducted since the SR. Do the new studies change the conclusions from the SR? | NA |

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| **Source of Systematic Review:**   * **Title** * **Author** * **Date** * **Citation, including page number** * **URL** | Amsterdam EA, Wenger NK, Brindis RG, et al. 2014 AHA/ACC guideline for the management of patients with non-ST-elevation acute coronary syndromes: a report of the American College of Cardiology/American Heart Association Task Force on Practice Guidelines. J Am Coll Cardiol. 2014;64:e139-228/ <http://www.onlinejacc.org/content/64/24/e139>. |
| Quote the guideline or recommendation verbatim about the process, structure or intermediate outcome being measured. If not a guideline, summarize the conclusions from the SR. | e139-228 Cardiac Rehabilitation and Physical Activity: Recommendation: All eligible patients with NSTE-ACS should be referred to a comprehensive cardiovascular rehabilitation program either before hospital discharge or during the first outpatient visit. (Class I, Level of Evidence: B) |
| Grade assigned to the **evidence** associated with the recommendation with the definition of the grade | NA |
| Provide all other grades and definitions from the evidence grading system | NA |
| Grade assigned to the **recommendation** with definition of the grade | All eligible patients with NSTE-ACS should be referred to a comprehensive cardiovascular rehabilitation program either before hospital discharge or during the first outpatient visit. (Class I, Level of Evidence: B) |
| Provide all other grades and definitions from the recommendation grading system | See Table 1 below. |
| Body of evidence:   * Quantity – how many studies? * Quality – what type of studies? | NA |
| Estimates of benefit and consistency across studies | NA |
| What harms were identified? | NA |
| Identify any new studies conducted since the SR. Do the new studies change the conclusions from the SR? | NA |

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| **Source of Systematic Review:**   * **Title** * **Author** * **Date** * **Citation, including page number** * **URL** | Stable Ischemic Heart Disease (Stable IHD): Fihn SD, et. Al. 2012 ACCF/AHA/ACP/AATS/PCNA/SCAI/STS guideline for the diagnosis and management of patients with stable ischemic heart disease: a report of the American College of Cardiology Foundation/American Heart Association Task Force on, American Association for Thoracic Surgery, Preventive Cardiovascular Nurses Association, Society for Cardiovascular Angiography and Interventions, and Society of Thoracic Surgeons. J Am Coll Cardiol 2012; 60: e44 –164.  http://circ.ahajournals.org/content/early/2012/11/19/CIR.0b013e318277d6a0.full.pdf |
| Quote the guideline or recommendation verbatim about the process, structure or intermediate outcome being measured. If not a guideline, summarize the conclusions from the SR. | Pages e91-92: 4.4.1.4. PHYSICAL ACTIVITY  1. For all patients, the clinician should encourage 30 to 60 minutes of moderate-intensity aerobic activity, such as brisk walking, at least 5 days and preferably 7 days per week, supplemented by an increase in daily lifestyle activities (e.g., walking breaks at work, gardening, household work) to improve cardiorespiratory fitness and move patients out of the least-fit, least-active, high-risk cohort (bottom 20%).  3. Medically supervised programs (cardiac rehabilitation) and physician-directed, home-based programs are recommended for at risk patients at first diagnosis. |
| Grade assigned to the **evidence** associated with the recommendation with the definition of the grade | NA |
| Provide all other grades and definitions from the evidence grading system | NA |
| Grade assigned to the **recommendation** with definition of the grade | For all patients, the clinician should encourage 30 to 60 minutes of moderate-intensity aerobic activity, such as brisk walking, at least 5 days and preferably 7 days per week, supplemented by an increase in daily lifestyle activities (e.g., walking breaks at work, gardening, household work) to improve cardiorespiratory fitness and move patients out of the least-fit, least-active, high-risk cohort (bottom 20%).  Recommendation Class I; Level of Evidence: B  Medically supervised programs (cardiac rehabilitation) and physician-directed, home-based programs are recommended for at risk patients at first diagnosis.  Recommendation Class I; Level of Evidence: A |
| Provide all other grades and definitions from the recommendation grading system | See Table 1 below. |
| Body of evidence:   * Quantity – how many studies? * Quality – what type of studies? | NA |
| Estimates of benefit and consistency across studies | NA |
| What harms were identified? | NA |
| Identify any new studies conducted since the SR. Do the new studies change the conclusions from the SR? | NA |

Table 1 (applies to all Provide all other grades and definitions from the evidence grading system)

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Note: A recommendation with Level of Evidence B or C does not imply that the recommendation is weak. Many important clinical questions addressed in the guidelines do not lend themselves to clinical trials. Although randomized trials are unavailable, there may be a very clear clinical consensus that a particular test or therapy is useful or effective. \*Data available from clinical trials or registries about the usefulness/efficacy in different subpopulations, such as sex, age, history of diabetes, history of prior myocardial infarction, history of heart failure, and prior aspirin use. †For comparative effectiveness recommendations (Class I and IIa; Level of Evidence A and B only), studies that support the use of comparator verbs should involve direct comparisons of the treatments or strategies being evaluated.

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| **Source of Systematic Review:**   * **Title** * **Author** * **Date** * **Citation, including page number** * **URL** | Heran BS,et al. Exercise-based cardiac rehabilitation for coronary heart disease. *Cochrane Database of Systematic Reviews* 2011, Issue 7. Art. No.: CD001800. DOI: 10.1002/14651858.CD001800.pub2.  <http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD001800.pub2/pdf>  **Citation and URL for methodology for evidence review and grading**: The systematic review identified quality of evidence based on risk of bias. System for determining risk of bias was explained in Chapter 8 of Cochrane Handbook for Systematic Reviews for Interventions, 5.0.2, updated September 2009 http://www.mrc-bsu.cam.ac.uk/cochrane/handbook502 . |
| Quote the guideline or recommendation verbatim about the process, structure or intermediate outcome being measured. If not a guideline, summarize the conclusions from the SR. | **The information in the following questions in this section is based on the Cochrane Systematic Review cited in the source of the systematic review.**  **Intervention/Service**: The effectiveness of exercise-based cardiac rehabilitation on mortality, morbidity and health-related quality of life of patients with CHD is addressed. Exercise-based cardiac rehabilitation is defined as a supervised or unsupervised inpatient, outpatient, or community- or home-based intervention including some form of exercise training that is applied to a cardiac patient population. The intervention could be exercise training alone or exercise training in addition to psychosocial and/or educational interventions (i.e. “comprehensive cardiac rehabilitation”). Usual care could include standard medical care, such as drug therapy, but did not receive any form of structured exercise training or advice.  **Outcomes**: Total mortality; Total MI; Total revascularizations; Total hospitalizations; Health-related quality of life; Costs and cost-effectiveness |
| Grade assigned to the **evidence** associated with the recommendation with the definition of the grade | An overall grade of methodological quality was not assigned. In the systematic review, individual study quality was graded on a scale for risk of bias.  **Allocation:** Nearly all the trial publications simply reported that the trial was “randomized” but did not provide any details. A total of 8/47 (17%) studies reported details of appropriate generation of the random sequence and 7/47 (15%) studies reported appropriate concealment of allocation.  **Blinding:** For exercise-based cardiac rehabilitation trials, it is not possible to blind patients and clinicians to the intervention. For the large majority of studies, insufficient information was provided to evaluate the blinding of assessors; only 4 of 47 (9%) reported that outcome assessors were blind to group allocation.  **Incomplete outcome data:** Losses to follow-up and drop out were relatively high, ranging from 21% to 48% in 12 trials. Follow-up of 80% or more was achieved in 33/47 (70%) studies. Furthermore, reasons for loss to follow and dropout were often not reported. Two trials did not report information on losses to follow-up. Several trials have excluded significant numbers of patients post-randomization, and thus in an intention to treat analysis, these then have been regarded as dropouts.  **Selective reporting:** A number of the included studies were not designed to assess treatment group differences in morbidity and mortality (as these were not the primary outcomes of these trials) and, therefore, may not have fully reported all clinical events that occurred during the follow-up period. All studies collecting validated health-related quality of life outcomes fully reported these outcomes.  **Quality of the evidence:** We found no evidence of publication bias for total mortality, CV mortality, CABG or PTCA. There was evidence of small study bias for total MI. |
| Provide all other grades and definitions from the evidence grading system | Two reviewers (BSH, JMHC) independently assessed the risk of bias in included studies using the Cochrane Collaboration’s recommended tool, which is a domain-based critical evaluation of the following domains: sequence generation; allocation concealment; blinding of outcome assessment; incomplete outcome data; and selective outcome reporting. Only author’s recommendations were provided: In medium to longer term (i.e. 12 or more months follow-up) exercise-based cardiac rehabilitation is effective in reducing overall and cardiovascular mortality and appears to reduce the risk of hospital admissions in the shorter-term (< 12 months follow-up) in patients with CHD. The available evidence does not demonstrate a reduction in the risk of total MI, CABG or PTCA with exercise based cardiac rehabilitation as compared to usual care at any duration of follow-up. Exercise-based cardiac rehabilitation should be recommended for patients similar to those included in the randomized controlled trials |
| Grade assigned to the **recommendation** with definition of the grade | NA |
| Provide all other grades and definitions from the recommendation grading system | NA |
| Body of evidence:   * Quantity – how many studies? * Quality – what type of studies? | Quantity-Seventeen studies (26 publications) met the inclusion criteria and had extractable data to assess the effects of exercise-based cardiac rehabilitation, compared with usual care, on mortality and morbidity in patients with CHD. These were added to the 30 studies (55 publications) from the original Cochrane review for a total of 47 studies (81 publications). Randomized controlled trials (RCTs) of exercise-based cardiac rehabilitation versus usual care with a follow-up period of at least six months. A total of 47 RCTs, with 10,794 patients.  Quality-Trial sample sizes varied widely from 28 to 2304, with a median intervention duration of three (range 0.25 to 30) months and a follow-up of 24 (range six to 120) months. Nearly all the trial publications simply reported that the trial was “randomized” but did not provide any details. For exercise-based cardiac rehabilitation trials, it is not possible to blind patients and clinicians to the intervention. For the large majority of studies, insufficient information was provided to evaluate the blinding of assessors; only 4 of 47 (9%) reported that outcome assessors were blind to group allocation. Losses to follow-up and drop out were relatively high, ranging from 21% to 48% in 12 trials. Follow-up of 80% or more was achieved in 33/47 (70%) studies. Based on funnel plot analysis, no publication bias was found for all cause mortality, cardiovascular mortality, CABG and PTCA. However, there appears to an absence of negative-result trials of small to medium size for MI which was statistically significant (P = 0.019). |
| Estimates of benefit and consistency across studies | Predictors of all-cause mortality, cardiovascular mortality, recurrent MI, and revascularisation (CABG and PTCA) were examined using univariate meta-regression. …a reduction in both total and cardiac mortality was observed in CHD patients randomized to exercise-based rehabilitation. However, this updated review shows that this mortality benefit is limited to studies with a follow-up of greater than 12months. We also found that with exercise the rate of hospital readmissions may be reduced in studies up to 12 months follow-up (based on 4 trials with 54/254 versus 73/225 events), but not in longer term follow-up. There was no difference between exercise-based cardiac rehabilitation and usual care groups in the risk of recurrent myocardial infarction or revascularization at any duration of follow-up.  The following are risk ratios (95% CI); (p) comparing participation in CR versus usual care based on meta-analyses from the Cochrane Systematic Review.  **Total Mortality**; CR vs Usual Care, Follow-up 6-12 months: 0.82 [ 0.67, 1.01 ]; (p = 0.061)  **Total Mortality**; CR vs Usual Care, Follow-up >12 months: 0.87 [ 0.75, 0.99 ]; (p = 0.041);  **CV Mortality**; CR vs Usual Care, Follow-up 6-12 months: 0.93 [ 0.71, 1.21 ]; (p=0.590)  **CV Mortality**; CR vs Usual Care, Follow-up >12 months: 0.74 [ 0.63, 0.87 ]; (p= 0.00018)  **Fatal and/or nonfatal MI** vs Usual Care, Follow –up 6-12 months: 0.92 [ 0.70, 1.22 ]; (p=0.560)  **Fatal and/or nonfatal MI** vs Usual Care, Follow – up >12 months: 0.97 [ 0.82, 1.15 ]; (p=0.730)  **CABG vs Usual Care**, Follow –up 6-12 months: 0.91 [ 0.67, 1.24 ]; (p=0.550)  **CABG vs Usual Care**, Follow – up >12 months: 0.93 [ 0.68, 1.27 ]; (p=0.650) NQF staff enter #/title  Version 6.5 05/29/13 9  **PTCA** vs Usual Care, Follow –up 6-12 months: 1.02 [ 0.69, 1.50 ]; (p=0.930)  **PTCA** vs Usual Care, Follow – up >12 months: 0.89 [ 0.66, 1.19 ]; (p=0.420)  **Hospital Admissions** vs Usual Care, Follow –up 6-12 months: 0.69 [ 0.51, 0.93 ]; (p=0.016)  **Hospital Admissions** vs Usual Care, Follow – up >12 months: 0.98 [ 0.87, 1.11 ]; (p=0.790)  Given both the heterogeneity in outcome measures and methods of reporting findings, a meta-analysis was not undertaken for **health-related quality of life**. In seven out of 10 trials reporting health related quality of life using validated measures there was evidence of a significantly higher level of quality of life with exercise-based cardiac rehabilitation than usual care |
| What harms were identified? | Although this review did not assess harm, “several studies have documented the safety of exercise based cardiac rehabilitation in patients with documented SIHD. The 2007 AHA Scientific Statement on Exercise and Acute Cardiovascular Events estimates the risk of a major adverse cardiac event (MACE) at 1 in 80,000 patient-hours. This low event rate applies to medically supervised programs that evaluate patients before participation, provide serial surveillance, and are equipped to handle emergencies.”  Fihn SD, et al 2012 ACCF/AHA/ACP/AATS/PCNA/SCAI/STS guideline for the diagnosis and management of patients with stable ischemic heart disease: a report of the American College of Cardiology Foundation/American Heart Association Task Force on, American Association for Thoracic Surgery, Preventive Cardiovascular Nurses Association, Society for Cardiovascular Angiography and Interventions, and Society of Thoracic Surgeons. *J Am Coll Cardiol* 2012; 60: e44 –164.  http://circ.ahajournals.org/content/early/2012/11/19/CIR.0b013e318277d6a0.full.pdf |
| Identify any new studies conducted since the SR. Do the new studies change the conclusions from the SR? | Anderson L, Thompson DR, Oldridge N, Zwisler AD, Rees K, Martin N, Taylor RS. Exercise-based cardiac rehabilitation  for coronary heart disease. *Cochrane Database of Systematic Reviews* 2016, Issue 1. Art. No.: CD001800. DOI:  10.1002/14651858.CD001800.pub3.  From the study: This updated Cochrane review supports the conclusions of the previous version of this review that, compared with no exercise control,  exercise-based CR reduces the risk of cardiovascular mortality but not total mortality. |

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**1a.4 OTHER SOURCE OF EVIDENCE**

*If source of evidence is NOT from a clinical practice guideline, USPSTF, or systematic review, please describe the evidence on which you are basing the performance measure.*

**1a.4.1** **Briefly SYNTHESIZE the evidence that supports the measure.** A list of references without a summary is not acceptable.

**1a.4.2 What process was used to identify the evidence?**

**1a.4.3.** **Provide the citation(s) for the evidence.**