Supplementary Data. Search strategy

*The following process was used in the literature search and review for each key question:

1. Searching strategies
2. Flow chart of the study selection process
3. Finally included studies
4. Evidence table for assessment of risk of bias and quality

1. Introduction of cardiac rehabilitation

The following are the basic searching strategies used for all key questions of the introduction part in the Cochrane Library. These basic searching strategies were combined with the specific searching strategy for each question using AND.

```
#1 MeSH descriptor: [Cardiac Rehabilitation] explode all trees
#2 ("cardia* or heart*") and *habilitation*:ti,ab,kw
#3 #1 or #2
#4 MeSH descriptor: [Myocardial Ischemia] explode all trees
#5 ((myocard* or heart* or coronary or cardia*) and (infarct* or isch* or attack*)):ti,ab,kw
#6 ("acute coronary syndrome" or ACS):ti,ab,kw
#7 (angina or stenocardia*):ti,ab,kw
#8 MeSH descriptor: [Myocardial Revascularization] explode all trees
#9 ((Myocard* or cardi* or coronary) and (Revascular* or angioplast*)):ti,ab,kw
#10 ((coronary or rotational) near atherectom*):ti,ab,kw
#11 ("coronary artery bypass" or CAGB or "aortocoronary bypass" or "coronary bypass"):ti,ab,kw
#12 MeSH descriptor: [Percutaneous Coronary Intervention] explode all trees
#13 ("percutaneous coronary intervention*" or PCI):ti,ab,kw
#14 (percutaneous next coronary near/2 (interven* or revascular*)):ti,ab,kw
#15 (stent* and (heart or cardiac*)):ti,ab,kw
#16 coronary near (disease* or bypass or thrombo* or angioplast*):ti,ab,kw
#17 (PTCA or "percutaneous transluminal coronary angioplasty"):ti,ab,kw
#18 MeSH descriptor: [Heart Bypass, Right] explode all trees
#19 ("heart manual"):ti,ab,kw
#20 (arrhythmia* or dysrhythmia* or bradycardia* or tachycardia*):ti,ab,kw
#21 (cardiopulmonary next arrest* or cardio-pulmonary next arrest*):ti,ab,kw
#22 heart failure:ti,ab,kw
#23 ((heart or cardiac or coronary) near/3 transplant*):ti,ab,kw
#24 {or #4-#23}
#25 (arthritis* or cancer* or stroke* or kidney* or "obstructive pulmonary" or claudication* or fracture* or Parkinson*):ti,ab,kw
#26 #24 not #25
#27 MeSH descriptor: [Rehabilitation] explode all trees
#28 (rehabilitat* or *habilitation):ti,ab,kw
#29 MeSH descriptor: [Physical and Rehabilitation Medicine] explode all trees
```
The same Cochrane Library searching strategy was used for KQ1 (“Should cardiac rehabilitation be an integral component of the care of acute coronary syndrome?”) and KQ4 (“When should cardiac rehabilitation exercise begin?”). The following is the final searching strategy, including the basic cardiac rehabilitation (CR) searching strategy:

**Searching strategies**

#37 MeSH descriptor: [Activities of Daily Living] explode all trees
#38 MeSH descriptor: [Exercise] explode all trees
#39 MeSH descriptor: [Exercise Therapy] explode all trees
#40 (exercise* near/2 (rehabilitat* or therap* or training or program* or activit* or toleran* or prescribe* or prescription* or structure* or unstructure* or un-structure* or supervis* or unsupervis* or un-supervis* or guided or unguided or dynamic or regime*)):ti,ab,kw
#41 (physical near/2 (exercise* or educat* or training or program* or activit* or regime*)):ti,ab,kw
#42 (aerobic* near/2 (exercise* or training or program* or activit* or regime*)):ti,ab,kw
#43 (strength* near (exercise* or training)):ti,ab,kw
#44 (endurance near (exercise* or training)):ti,ab,kw
#45 (fitness near/2 (training or program* or regime*)):ti,ab,kw
#46 ((resistance or resistive) near (exercise* or training)):ti,ab,kw
#47 (isometric near/2 (exercise* or training or program* or activit* or regime*)):ti,ab,kw
#48 ((high* frequency or low* frequency) near/2 (exercise* or training or program* or activit* or regime*)):ti,ab,kw
#49 ((high* intensi* or low* intensi*) near/2 (exercise* or training or program* or activit* or regime*)):ti,ab,kw
#50 MeSH descriptor: [Managed Care Programs] explode all trees
#51 ((multifactor* or multifacet* or managed care) near program*):ti,ab,kw
#52 [or #37-#51]
#53 #36 and #52 Publication Year from 2009 to 2018

*Flow chart of study selection process*
Finally included studies: KQ1

Reference | Article
---|---

SR = systematic reviews.

**Evidence table for assessment of methodological quality of systematic reviews using AMSTAR 2 and LOE using SIGN methods: KQ1**

<table>
<thead>
<tr>
<th>Reference No.</th>
<th>Quality items</th>
<th>LOE</th>
</tr>
</thead>
<tbody>
<tr>
<td>SR1</td>
<td>Y</td>
<td>P</td>
</tr>
</tbody>
</table>

Notes:
- **Records identified through database searching**
  - Cochrane (43), Embase (661), PubMed (161)
  - Total (n=865)
- **Records after duplicates removed**
  - (n=811)
- **Records screened on basis of title and abstract**
  - (n=811)
- **Full-text articles accessed for eligibility**
  - (n=40)
  - KQ1 (n=32), KQ4 (n=26): Allow duplication between KQ
- **Studies included in qualitative synthesis**
  - (n=11), KQ1 9, KQ4 2
  - LOE evaluation (KQ1-SR: 4, KQ4-SR: 1)
- **Records excluded**
  - (n=771)
  - Full-text articles excluded, with reasons (n=29)
    - 1. The patient does not have acute coronary syndrome (n=2)
    - 2. Literatures irrelevant to the key question (n=15)
    - 3. Non-human studies (animal study or preclinical studies) (n=0)
    - 4. Literatures published in languages other than English or Korean (n=1)
    - 5. Duplicate publication (n=0)
    - 6. Full text unavailable (n=4)
    - 7. Other (n=7; not SR or data for analysis are dated prior to 2009)
1. Did the research questions and inclusion criteria for the review include the components of PICO? 2. Did the report of the review contain an explicit statement that the review methods were established prior to the conduct of the review and did the report justify any significant deviations from the protocol? 3. Did the review authors explain their selection of the study designs for inclusion in the review? 4. Did the review authors use a comprehensive literature search strategy? 5. Did the review authors perform study selection in duplicate? 6. Did the review authors perform data extraction in duplicate? 7. Did the review authors provide a list of excluded studies and justify the exclusions? 8. Did the review authors describe the included studies in adequate detail? 9. Did the review authors use a satisfactory technique for assessing the RoB in individual studies that were included in the review? 10. Did the review authors report on the sources of funding for the studies included in the review? 11. If meta-analysis was performed did the review authors use appropriate methods for statistical combination of results? 12. If meta-analysis was performed, did the review authors assess the potential impact of RoB in individual studies on the results of the meta-analysis or other evidence synthesis? 13. Did the review authors account for RoB in individual studies when interpreting/discussing the results of the review? 14. Did the review authors provide a satisfactory explanation for, and discussion of, any heterogeneity observed in the results of the review? 15. If they performed quantitative synthesis did the review authors carry out an adequate investigation of publication bias (small study bias) and discuss its likely impact on the results of the review? 16. Did the review authors report any potential sources of conflict of interest, including any funding they received for conducting the review?

LOE = level of evidence; N = no; P = partial yes; RoB = risk of bias; SIGN = Scottish Intercollegiate Guidelines Network; SR = systematic reviews; Y = yes.

**Finally included studies: KQ4**

<table>
<thead>
<tr>
<th>Reference No.</th>
<th>Article</th>
</tr>
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SR = systematic reviews.

**Evidence table for assessment of methodological quality of systematic reviews using AMSTAR 2.0 and LOE using SIGN methods: KQ4**

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<th>Quality items</th>
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<td>1++</td>
</tr>
<tr>
<td>SR1</td>
<td>Y  P  Y  P  Y  Y  Y  P  Y  N  Y  Y  Y  Y  Y  Y  Y</td>
<td>1++</td>
</tr>
</tbody>
</table>

1. Did the research questions and inclusion criteria for the review include the components of PICO? 2. Did the report of the review contain an explicit statement that the review methods were established prior to the conduct of
the review and did the report justify any significant deviations from the protocol? 3. Did the review authors explain their selection of the study designs for inclusion in the review? 4. Did the review authors use a comprehensive literature search strategy? 5. Did the review authors perform study selection in duplicate? 6. Did the review authors perform data extraction in duplicate? 7. Did the review authors provide a list of excluded studies and justify the exclusions? 8. Did the review authors describe the included studies in adequate detail? 9. Did the review authors use a satisfactory technique for assessing the RoB in individual studies that were included in the review? 10. Did the review authors report on the sources of funding for the studies included in the review? 11. If meta-analysis was performed did the review authors use appropriate methods for statistical combination of results? 12. If meta-analysis was performed, did the review authors assess the potential impact of RoB in individual studies on the results of the meta-analysis or other evidence synthesis? 13. Did the review authors account for RoB in individual studies when interpreting/discussing the results of the review? 14. Did the review authors provide a satisfactory explanation for, and discussion of, any heterogeneity observed in the results of the review? 15. If they performed quantitative synthesis did the review authors carry out an adequate investigation of publication bias (small study bias) and discuss its likely impact on the results of the review? 16. Did the review authors report any potential sources of conflict of interest, including any funding they received for conducting the review?

LOE = level of evidence; N = no; P = partial yes; RoB = risk of bias; SIGN = Scottish Intercollegiate Guidelines Network; SR = systematic reviews; Y = yes.

The following is the final Cochrane Library searching strategy used for KQ2 (“Does cardiac rehabilitation affect the outcomes of patients with cardiovascular disease?”) including the basic CR searching strategy:

**Searching strategies**

#37  (“Cardiovascular mortality” or "all-cause mortality" or "hospital readmission rates" or morbidity or "Quality of life" or QOL or "mental health" or "return to work"):ti,ab,kw

#38  MeSH descriptor: [Morbidity] explode all trees

#39  MeSH descriptor: [Quality of Life] explode all trees

#40  MeSH descriptor: [Mental Health] explode all trees

#41  MeSH descriptor: [Return to Work] explode all trees

#42  self-efficacy or "patient satisfaction" or "CV recurrence rate" or "incidence of recurrent" or "fatal MI" or "nonfatal MI"

#43  incidence of recurrent MI or "progression of coronary atherosclerosis" or depression*

#44  {or #37-#43}

#45  #36 and #44 Publication Year from 2017 to 2018

**Flow chart of study selection process**
Finally included studies

<table>
<thead>
<tr>
<th>Reference No.</th>
<th>Article</th>
</tr>
</thead>
<tbody>
<tr>
<td>SR1</td>
<td>Abell B, Glasziou P, Hoffmann T. The contribution of individual exercise training components to clinical outcomes in randomised controlled trials of cardiac rehabilitation: a systematic review and meta-regression. Sport Med·Open. 2017;3(1).</td>
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SR = systematic reviews.

Evidence table for assessment of methodological quality of systematic reviews using AMSTAR 2.0 and LOE using SIGN methods: KQ 2

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<tr>
<td>SR2</td>
<td>Y</td>
<td>P</td>
</tr>
<tr>
<td>SR3</td>
<td>Y</td>
<td>N</td>
</tr>
</tbody>
</table>

1. Did the research questions and inclusion criteria for the review include the components of PICO? 2. Did the report of the review contain an explicit statement that the review methods were established prior to the conduct of
the review and did the report justify any significant deviations from the protocol? 3. Did the review authors explain their selection of the study designs for inclusion in the review? 4. Did the review authors use a comprehensive literature search strategy? 5. Did the review authors perform study selection in duplicate? 6. Did the review authors perform data extraction in duplicate? 7. Did the review authors provide a list of excluded studies and justify the exclusions? 8. Did the review authors describe the included studies in adequate detail? 9. Did the review authors use a satisfactory technique for assessing the RoB in individual studies that were included in the review? 10. Did the review authors report on the sources of funding for the studies included in the review? 11. If meta-analysis was performed did the review authors use appropriate methods for statistical combination of results? 12. If meta-analysis was performed, did the review authors assess the potential impact of RoB in individual studies on the results of the meta-analysis or other evidence synthesis? 13. Did the review authors account for RoB in individual studies when interpreting/discussing the results of the review? 14. Did the review authors provide a satisfactory explanation for, and discussion of, any heterogeneity observed in the results of the review? 15. If they performed quantitative synthesis did the review authors carry out an adequate investigation of publication bias (small study bias) and discuss its likely impact on the results of the review? 16. Did the review authors report any potential sources of conflict of interest, including any funding they received for conducting the review?

LOE = level of evidence; N = no; P = partial yes; RoB = risk of bias; SIGN = Scottish Intercollegiate Guidelines Network; SR = systematic reviews; Y = yes.

The following is the final Cochrane Library searching strategy used for KQ3 (“Does cardiac rehabilitation improve the quality of life of patients with cardiovascular disease?”) including the basic CR searching strategy:

**Searching strategies**

#37  (“quality of life” or qol):ti,ab,kw
#38  (“quality of wellbeing” or “quality of well being” or qwb):ti,ab,kw
#39  MeSH descriptor: [Quality of Life] explode all trees
#40  {or #37-#39}
#41  #36 and #40 Publication Year from 2017 to 2018

**Flow chart of study selection process**
Finally included studies

<table>
<thead>
<tr>
<th>Reference No.</th>
<th>Article</th>
</tr>
</thead>
</table>

SR = systematic reviews.

Evidence table for assessment of methodological quality of systematic reviews using AMSTAR 2.0 and LOE using SIGN methods

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<th>Quality items</th>
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<td>2</td>
</tr>
<tr>
<td>SR1</td>
<td>Y</td>
<td>N</td>
</tr>
</tbody>
</table>

1. Did the research questions and inclusion criteria for the review include the components of PICO? 2. Did the report of the review contain an explicit statement that the review methods were established prior to the conduct of the review and did the report justify any significant deviations from the protocol? 3. Did the review authors explain their selection of the study designs for inclusion in the review? 4. Did the review authors use a comprehensive literature search strategy? 5. Did the review authors perform study selection in duplicate? 6. Did the review authors perform data extraction in duplicate? 7. Did the review authors provide a list of excluded studies and justify the exclusions? 8. Did the review authors describe the included studies in adequate detail? 9. Did the review authors use a satisfactory technique for assessing the RoB in individual studies that were included in the review? 10. Did the review authors report on the sources of funding for the studies included in the review? 11. If meta-analysis was performed did the review authors use appropriate methods for statistical combination of results? 12. If meta-
analysis was performed, did the review authors assess the potential impact of RoB in individual studies on the results of the meta-analysis or other evidence synthesis? 13. Did the review authors account for RoB in individual studies when interpreting/discussing the results of the review? 14. Did the review authors provide a satisfactory explanation for, and discussion of, any heterogeneity observed in the results of the review? 15. If they performed quantitative synthesis did the review authors carry out an adequate investigation of publication bias (small study bias) and discuss its likely impact on the results of the review? 16. Did the review authors report any potential sources of conflict of interest, including any funding they received for conducting the review?

LOE = level of evidence; N = no; P = partial yes; RoB = risk of bias; SIGN = Scottish Intercollegiate Guidelines Network; SR = systematic reviews; Y = yes.

The following is the final Cochrane Library searching strategy used for KQ5 (“How should cardiac rehabilitation be structured?”) including the basic CR searching strategy:

**Searching strategies**

#37 (process* or facilit* or machine* or treadmill* or "cycle ergometer*" or "ECG monitor*" or "blood pressure monitor*" or "automated external defibrillator*" or AED or "emergency cart*" or "12-lead ECG" or "blood glucose monitor*" or "percutaneous oxygen saturation monitor*" or "spirometry device*"):ti,ab,kw

#38 (cardiology* or dietetic* or nursing* or "exercise physiolog*" or "occupational therap*" or physiotherap* or psycholog* or "social work*"):ti,ab,kw

#39 ("organizational structure" or policy or polices or process* or construction* or concept* or content* or phase* or "flow chart" or "aerobic exercise machine*" or treadmill or cycle* or ergometer* or "medical director*" or director* or nurse* or "exercise physiologist*" or "occupational therapist*" or physiotherapist* or psychologist* or "social work*" or dietician*):ti,ab,kw

#40 (Facility or Equipment or Personnel* or medical staff* or staff* or Service* or "service framework*" or Phase*):ti,ab,kw

#41 MeSH descriptor: [Organizations] explode all trees

#42 MeSH descriptor: [Delivery of Health Care] explode all trees

#43 {or #37–#42}

#44 #36 and #43 Publication Year from 2012 to 2018

*Flow chart of study selection process*
Finally included studies

<table>
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<tr>
<th>Reference</th>
<th>Article</th>
</tr>
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</table>

SR = systematic reviews.

Evidence table for assessment of methodological quality of systematic reviews using AMSTAR 2.0 and LOE using SIGN methods: KQ 5

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</tr>
<tr>
<td>SR1</td>
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<tr>
<td>SR2</td>
<td>Y  N  N  P  Y  Y  Y  P  Y  N  Y  Y  Y  N  Y  Y</td>
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<tr>
<td>SR3</td>
<td>Y  P  Y  P  N  N  N  P  Y  Y  Y  Y  Y  Y  N  Y</td>
<td>1++</td>
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1. Did the research questions and inclusion criteria for the review include the components of PICO? 2. Did the report of the review contain an explicit statement that the review methods were established prior to the conduct of the review and did the report justify any significant deviations from the protocol? 3. Did the review authors explain their selection of the study designs for inclusion in the review? 4. Did the review authors use a comprehensive literature search strategy? 5. Did the review authors perform study selection in duplicate? 6. Did the review authors
perform data extraction in duplicate? 7. Did the review authors provide a list of excluded studies and justify the exclusions? 8. Did the review authors describe the included studies in adequate detail? 9. Did the review authors use a satisfactory technique for assessing the RoB in individual studies that were included in the review? 10. Did the review authors report on the sources of funding for the studies included in the review? 11. If meta-analysis was performed did the review authors use appropriate methods for statistical combination of results? 12. If meta-analysis was performed, did the review authors assess the potential impact of RoB in individual studies on the results of the meta-analysis or other evidence synthesis? 13. Did the review authors account for RoB in individual studies when interpreting/ discussing the results of the review? 14. Did the review authors provide a satisfactory explanation for, and discussion of, any heterogeneity observed in the results of the review? 15. If they performed quantitative synthesis did the review authors carry out an adequate investigation of publication bias (small study bias) and discuss its likely impact on the results of the review? 16. Did the review authors report any potential sources of conflict of interest, including any funding they received for conducting the review?

LOE = level of evidence; N = no; P = partial yes; RoB = risk of bias; SIGN = Scottish Intercollegiate Guidelines Network; SR = systematic reviews; Y = yes.

The following is the final Cochrane Library searching strategy used for KQ6 (“Can cardiac rehabilitation programs lower the cost of health management for patients with acute coronary syndrome?”) including the basic CR searching strategy:

**Searching strategies**

#37 MeSH descriptor: [Costs and Cost Analysis] explode all trees
#38 MeSH descriptor: [Economics] explode all trees
#39 MeSH descriptor: [Fees and Charges] explode all trees
#40 MeSH descriptor: [Budgets] explode all trees
#41 (cost* near/2 (effective* or utilit* or benefit* or minimi*)):ti,ab,kw
#42 (price or pricing or financ* or fee or fees):ti,ab,kw
#43 (value near/2 (money or monetary)):ti,ab,kw
#44 [or #37-#43]
#45 #36 and #44

*Flow chart of study selection process*
Finally included studies

<table>
<thead>
<tr>
<th>Reference No.</th>
<th>Article</th>
</tr>
</thead>
</table>

SR = systematic reviews.

Evidence table for assessment of methodological quality of systematic reviews using AMSTAR 2.0 and LOE using SIGN methods

<table>
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<th>Reference Number</th>
<th>Quality items</th>
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<tr>
<td>SR1</td>
<td></td>
<td>1++</td>
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</table>

1. Did the research questions and inclusion criteria for the review contain the components of PICO? 2. Did the report of the review contain an explicit statement that the review methods were established prior to the conduct of the review and did the report justify any significant deviations from the protocol? 3. Did the review authors explain their selection of the study designs for inclusion in the review? 4. Did the review authors use a comprehensive literature search strategy? 5. Did the review authors perform study selection in duplicate? 6. Did the review authors perform data extraction in duplicate? 7. Did the review authors provide a list of excluded studies and justify the exclusions? 8. Did the review authors describe the included studies in adequate detail? 9. Did the review authors use a satisfactory technique for assessing the RoB in individual studies that were included in the review? 10. Did the review authors report on the sources of funding for the studies included in the review? 11. If meta-analysis was performed did the review authors use appropriate methods for statistical combination of results? 12. If meta-analysis was performed, did the review authors assess the potential impact of RoB in individual studies on the results of the meta-analysis or other evidence synthesis? 13. Did the review authors account for RoB in individual
studies when interpreting/discussing the results of the review? 14. Did the review authors provide a satisfactory explanation for, and discussion of, any heterogeneity observed in the results of the review? 15. If they performed quantitative synthesis did the review authors carry out an adequate investigation of publication bias (small study bias) and discuss its likely impact on the results of the review? 16. Did the review authors report any potential sources of conflict of interest, including any funding they received for conducting the review?

LOE = level of evidence; N = no; P = partial yes; RoB = risk of bias; SIGN = Scottish Intercollegiate Guidelines Network; SR = systematic reviews; Y = yes.
2. Assessment of cardiac rehabilitation

The following is the basic searching strategy used for cardiac rehabilitation assessment in the Cochrane Library, combined with the specific searching strategy for each question using AND.

#1 MeSH descriptor: [Cardiac Rehabilitation] explode all trees
#2 (*cardia* or heart*) and *habilitation*:ti,ab,kw
#3 #1 or #2
#4 MeSH descriptor: [Myocardial Ischemia] explode all trees
#5 ((myocard* or heart* or coronary or cardia*) and (infarct* or isch* or attack*)):ti,ab,kw
#6 ("acute coronary syndrome" or ACS):ti,ab,kw
#7 (angina or stenocardia*):ti,ab,kw
#8 MeSH descriptor: [Myocardial Revascularization] explode all trees
#9 ((Myocard* or cardi* or coronary) and (Revascular* or angioplast*)):ti,ab,kw
#10 ((coronary or rotational) near atherectom*):ti,ab,kw
#11 ("coronary artery bypass" or CABG or "aortocoronary bypass" or "coronary bypass"):ti,ab,kw
#12 MeSH descriptor: [Percutaneous Coronary Intervention] explode all trees
#13 ("percutaneous coronary intervention*" or PCI):ti,ab,kw
#14 (percutaneous next coronary near/2 (interven* or revascular*)):ti,ab,kw
#15 (stent* and (heart or cardiac*)):ti,ab,kw
#16 coronary near (disease* or bypass or thrombo* or angioplast*):ti,ab,kw
#17 (PTCA or "percutaneous transluminal coronary angioplasty"):ti,ab,kw
#18 MeSH descriptor: [Heart Bypass, Right] explode all trees
#19 ("heart manual"):ti,ab,kw
#20 [or #4-#19]
#21 MeSH descriptor: [Rehabilitation] explode all trees
#22 (rehabilitat* or *habilitation):ti,ab,kw
#23 MeSH descriptor: [Physical and Rehabilitation Medicine] explode all trees
#24 MeSH descriptor: [Health Facilities] explode all trees
#25 MeSH descriptor: [Rehabilitation Nursing] explode all trees
#26 [or #21-#25]
#27 #20 and #26
#28 #27 or #3

The following is the final Cochrane Library searching strategy used for KQ7 ("Is individualized cardiac rehabilitation program more effective than the existing fixed cardiac rehabilitation program?") including the basic CR assessment searching strategy:

Searching strategies

#29 ((individual* or personal* or "patient centred" or "patient centered" or "person centred" or "person centered") near/5 need*):ti,ab,kw
#30 (tailored near/6 need*):ti,ab,kw
#31 (standard* near/6 program*):ti,ab,kw
#32 [or #29-#31]
#33 #28 and #32 Publication Year from 2016 to 2018

Flow chart of the study selection process
Finally included studies

<table>
<thead>
<tr>
<th>Reference No.</th>
<th>Article</th>
</tr>
</thead>
</table>

RCT = randomized controlled trial.

Evidence table for assessment of risk of bias and quality

Methodological quality of RCT using Cochrane RoB tool and LOE using SIGN methods

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<th>Reference No.</th>
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</tr>
<tr>
<td>RCT3</td>
<td>L</td>
<td>U</td>
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</table>

1. Random sequence generation: selection bias (biased allocation to interventions) due to inadequate generation of a randomized. 2. Allocation concealment: selection bias (biased allocation to interventions) due to inadequate concealment of allocations prior to assignment. 3. Blinding of participants and personnel: performance bias due to knowledge of the allocated interventions by participants and personnel During the study. 4. Blinding of
outcome assessment: detection bias due to knowledge of the allocated interventions by outcome assessors. 5. Incomplete outcome data: attrition bias due to amount, nature or handling of incomplete outcome data. 6. Selective reporting: reporting bias due to selective outcome reporting. 7. Other bias: bias due to problems not covered elsewhere in the table.

H = high risk of bias; L = low risk of bias; LOE = level of evidence; RCT = randomized controlled trial; RoB = risk of bias; SIGN = Scottish Intercollegiate Guidelines Network; U = unclear risk of bias.

KQ8 (“Should psychological interventions concerning anxiety, depression, and stress be included in the cardiac rehabilitation program?”) including the basic CR assessment searching strategy:

**Searching strategies**

#1 ((matched or stepped) near/3 care):ti,ab,kw  
#2 (tier or tiers or tiered):ti,ab,kw  
#3 (level* near/2 intervention*):ti,ab,kw  
#4 (step* up or step* down):ti,ab,kw  
#5 (matrix and psych*):ti,ab,kw  
#6 psychologist*:ti,ab,kw  
#7 MeSH descriptor: [Psychology] explode all trees  
#8 psycholog*:ti,ab,kw  
#9 (psychosocial or "psycho social"):ti,ab,kw  
#10 (stress near manage*):ti,ab,kw  
#11 (depress* or low next mood*):ti,ab,kw  
#12 {or #1-#11}

**Flow chart of study selection process**

**Finally included studies**

<table>
<thead>
<tr>
<th>Reference No.</th>
<th>Article</th>
</tr>
</thead>
<tbody>
<tr>
<td>SR1</td>
<td>Klainin-Yobas, P., Ng, S. H., Stephen, P. D. M., Lau, Y. Efficacy of psychosocial interventions</td>
</tr>
</tbody>
</table>


RCT = randomized controlled trial; SR = systematic reviews.

**Evidence table for assessment of RoB and quality**

Methodological quality of systematic reviews using AMSTAR 2.0 and LOE using SIGN methods

<table>
<thead>
<tr>
<th>Reference No.</th>
<th>Quality items</th>
<th>LOE</th>
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<tr>
<td>SR2</td>
<td>Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y 1++</td>
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1. Did the research questions and inclusion criteria for the review include the components of PICO? 2. Did the report of the review contain an explicit statement that the review methods were established prior to the conduct of the review and did the report justify any significant deviations from the protocol? 3. Did the review authors explain their selection of the study designs for inclusion in the review? 4. Did the review authors use a comprehensive literature search strategy? 5. Did the review authors perform study selection in duplicate? 6. Did the review authors perform data extraction in duplicate? 7. Did the review authors provide a list of excluded studies and justify the exclusions? 8. Did the review authors describe the included studies in adequate detail? 9. Did the review authors use a satisfactory technique for assessing the RoB in individual studies that were included in the review? 10. Did the review authors report on the sources of funding for the studies included in the review? 11. If meta-analysis was performed did the review authors use appropriate methods for statistical combination of results? 12. If meta-analysis was performed, did the review authors assess the potential impact of RoB in individual studies on the results of the meta-analysis or other evidence synthesis? 13. Did the review authors account for RoB in individual studies when interpreting/discussing the results of the review? 14. Did the review authors provide a satisfactory explanation for, and discussion of, any heterogeneity observed in the results of the review? 15. If they performed quantitative synthesis did the review authors carry out an adequate investigation of publication bias (small study bias) and discuss its likely impact on the results of the review? 16. Did the review authors report any potential sources of conflict of interest, including any funding they received for conducting the review?

LOE = level of evidence; N = no; P = partial yes; RoB = risk of bias; SIGN = Scottish Intercollegiate Guidelines Network; SR = systematic reviews; Y = yes.

Methodological quality of RCT using RoB and LOE using SIGN methods

<table>
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<tr>
<th>Reference</th>
<th>Quality items</th>
<th>LOE</th>
</tr>
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No.  | 1  | 2  | 3  | 4  | 5  | 6  | 7  |
---   |---  |---  |---  |---  |---  |---  |---  |
RCT1  | L   | H   | H   | H   | L   | L   | L   |

1. Random sequence generation: selection bias (biased allocation to interventions) due to inadequate generation of a randomized.
2. Allocation concealment: selection bias (biased allocation to interventions) due to inadequate concealment of allocations prior to assignment.
3. Blinding of participants and personnel: performance bias due to knowledge of the allocated interventions by participants and personnel during the study.
4. Blinding of outcome assessment: detection bias due to knowledge of the allocated interventions by outcome assessors.
5. Incomplete outcome data: attrition bias due to amount, nature or handling of incomplete outcome data.
6. Selective reporting: reporting bias due to selective outcome reporting.
7. Other bias: bias due to problems not covered elsewhere in the table.

H = high risk of bias; L = low risk of bias; LOE = level of evidence; RCT = randomized controlled trial; RoB = risk of bias; SIGN = Scottish Intercollegiate Guidelines Network.

The following is the final Cochrane Library searching strategy used for KQ9 (“Is cardiopulmonary exercise test necessary for cardiac rehabilitation?”) and KQ10 (“Is submaximal exercise test such as the 6-minute walk test useful for cardiac rehabilitation?”) including the basic CR assessment searching strategy:

**Searching strategies: KQ9 & KQ10**

#1  
("cardiopulmonary exercise test" or "exercise stress test" or "submaximal exercise test" or "submaximal exercise stress test" or "six minute walk test" or "six minute cycle test" or "cycle test"):ti,ab,kw

#2  
MeSH descriptor: [Exercise Test] explode all trees

#3  
submaximal test:ti,ab,kw

#4  
{or #1-#3}

#5  
#4

*Flow chart of study selection process: KQ9 & KQ10*
**Finally included studies: KQ9**

<table>
<thead>
<tr>
<th>Reference No.</th>
<th>Article</th>
</tr>
</thead>
</table>
| **RCT1**      | Balady, G. J., Leitschuh, M. L., Jacobs, A. K., Merrell, D., Weiner, D. A., Ryan, T. J.  

**RCT** = randomized controlled trial; **OS** = observational study.
Evidence table for assessment of RoB and quality: KQ9

Methodological quality of RCT using RoB and LOE using SIGN methods

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1. Random sequence generation: selection bias (biased allocation to interventions) due to inadequate generation of a randomized. 2. Allocation concealment: selection bias (biased allocation to interventions) due to inadequate concealment of allocations prior to assignment. 3. Blinding of participants and personnel: performance bias due to knowledge of the allocated interventions by participants and personnel during the study. 4. Blinding of outcome assessment: detection bias due to knowledge of the allocated interventions by outcome assessors. 5. Incomplete outcome data: attrition bias due to amount, nature or handling of incomplete outcome data. 6. Selective reporting: reporting bias due to selective outcome reporting. 7. Other bias: bias due to problems not covered elsewhere in the table.

**H** = high risk of bias; **L** = low risk of bias; **LOE** = level of evidence; **RCT** = randomized controlled trial; **RoB** = risk of bias; **SIGN** = Scottish Intercollegiate Guidelines Network.

Methodological quality of OS using the risk of bias assessment tool for non-randomized studies and LOE using SIGN methods

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<td>L</td>
<td>U</td>
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</tbody>
</table>

1. Comparability = selection bias caused by inappropriate participant selection. 2. Selection of participants = selection bias caused by inadequate selection of participants for intervention, exposure, or patient group. 3. Confounding variables = Selection bias caused by inadequate confirmation and consideration of confounding variables. 4. Exposure measurement = performance bias caused by inadequate measurement of intervention or exposure. 5. Blinding of outcome assessment = detection bias caused by inadequate blinding of outcome assessment. 6. Outcome assessment = detection bias caused by inappropriate outcome assessment method. 7. Incomplete outcome data = attrition bias caused by inappropriate handling of incomplete data. 8. Selective outcome reporting = reporting bias caused by selective outcome reporting.

**H** = high risk of bias; **L** = low risk of bias; **LOE** = level of evidence; **OS** = observational study; **SIGN** = Scottish Intercollegiate Guidelines Network; **U** = unclear risk of bias.

Finally included studies: KQ10

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SR = systematic reviews; OS = observational study.

**Evidence table for assessment of RoB and quality: KQ10**

Evidence table for assessment of RoB and quality

Methodological quality of systematic reviews using AMSTAR 2.0 and LOE using SIGN methods

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1. Did the research questions and inclusion criteria for the review include the components of PICO? 2. Did the report of the review contain an explicit statement that the review methods were established prior to the conduct of the review and did the report justify any significant deviations from the protocol? 3. Did the review authors explain their selection of the study designs for inclusion in the review? 4. Did the review authors use a comprehensive literature search strategy? 5. Did the review authors perform study selection in duplicate? 6. Did the review authors perform data extraction in duplicate? 7. Did the review authors provide a list of excluded studies and justify the exclusions? 8. Did the review authors describe the included studies in adequate detail? 9. Did the review authors...
use a satisfactory technique for assessing the RoB in individual studies that were included in the review? 10. Did the review authors report on the sources of funding for the studies included in the review? 11. If meta-analysis was performed did the review authors use appropriate methods for statistical combination of results? 12. If meta-analysis was performed, did the review authors assess the potential impact of RoB in individual studies on the results of the meta-analysis or other evidence synthesis? 13. Did the review authors account for RoB in individual studies when interpreting/ discussing the results of the review? 14. Did the review authors provide a satisfactory explanation for, and discussion of, any heterogeneity observed in the results of the review? 15. If they performed quantitative synthesis did the review authors carry out an adequate investigation of publication bias (small study bias) and discuss its likely impact on the results of the review? 16. Did the review authors report any potential sources of conflict of interest, including any funding they received for conducting the review?

LOE = level of evidence; N = no; P = partial yes; RoB = risk of bias; SIGN = Scottish Intercollegiate Guidelines Network; SR = systematic reviews; Y = yes.

Methodological quality of OS using the risk of bias assessment tool for non-randomized studies and LOE using SIGN methods

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<td>H L H L L L L</td>
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<tr>
<td>OS6</td>
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</table>

1. Comparability = selection bias caused by inappropriate participant selection. 2. Selection of participants = selection bias caused by inadequate selection of participants for intervention, exposure, or patient group. 3. Confounding variables = Selection bias caused by inadequate confirmation and consideration of confounding variables. 4. Exposure measurement = performance bias caused by inadequate measurement of intervention or exposure. 5. Blinding of outcome assessment = detection bias caused by inadequate blinding of outcome assessment. 6. Outcome assessment = detection bias caused by inappropriate outcome assessment method. 7. Incomplete outcome data = attrition bias caused by inappropriate handling of inappropriate data. 8. Selective outcome reporting = reporting bias caused by selective outcome reporting.

H = high risk of bias; L = low risk of bias; LOE = level of evidence; OS = observational study; SIGN = Scottish Intercollegiate Guidelines Network; U = unclear risk of bias.

The following is the final Cochrane Library searching strategy used for KQ11 ("What measures effectively promote participation in cardiac rehabilitation?") and KQ12 ("What measures effectively increase physical activity compliance?") including the basic CR assessment searching strategy:

**Searching strategies**
Flow chart of study selection process: KQ11 & KQ12

 Eventually included studies: KQ11

<table>
<thead>
<tr>
<th>Reference</th>
<th>Article</th>
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<tbody>
<tr>
<td>RCT1</td>
<td>Grace, S. L., Midence, L., Oh, P., Brister, S., Chessex, C., Stewart, D. E., Arthur, H. M. Cardiac</td>
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SR = systematic reviews; RCT = randomized controlled trial.

**Evidence table for assessment of risk of bias and quality: KQ11**

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<td>SR1</td>
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<td>2-</td>
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1. Did the research questions and inclusion criteria for the review include the components of PICO? 2. Did the report of the review contain an explicit statement that the review methods were established prior to the conduct of the review and did the report justify any significant deviations from the protocol? 3. Did the review authors explain their selection of the study designs for inclusion in the review? 4. Did the review authors use a comprehensive literature search strategy? 5. Did the review authors perform study selection in duplicate? 6. Did the review authors perform data extraction in duplicate? 7. Did the review authors provide a list of excluded studies and justify the exclusions? 8. Did the review authors describe the included studies in adequate detail? 9. Did the review authors use a satisfactory technique for assessing the RoB in individual studies that were included in the review? 10. Did the review authors report on the sources of funding for the studies included in the review? 11. If meta-analysis was performed did the review authors use appropriate methods for statistical combination of results? 12. If meta-analysis was performed, did the review authors assess the potential impact of RoB in individual studies on the results of the meta-analysis or other evidence synthesis? 13. Did the review authors account for RoB in individual studies when interpreting/discussing the results of the review? 14. Did the review authors provide a satisfactory explanation for, and discussion of, any heterogeneity observed in the results of the review? 15. If they performed quantitative synthesis did the review authors carry out an adequate investigation of publication bias (small study bias) and discuss its likely impact on the results of the review? 16. Did the review authors report any potential sources of conflict of interest, including any funding they received for conducting the review?

LOE = level of evidence; N = no; P = partial yes; RoB = risk of bias; SR = systematic reviews; Y = yes.

**RCTs**

<table>
<thead>
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<tr>
<td>RCT2</td>
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<td>1+</td>
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</tbody>
</table>

1. Random sequence generation: selection bias (biased allocation to interventions) due to inadequate generation of a randomized. 2. Allocation concealment: selection bias (biased allocation to interventions) due to inadequate concealment of allocations prior to assignment. 3. Blinding of participants and personnel: performance bias due
to knowledge of the allocated interventions by participants and personnel During the study. 4. Blinding of outcome assessment: detection bias due to knowledge of the allocated interventions by outcome assessors. 5. Incomplete outcome data: attrition bias due to amount, nature or handling of incomplete outcome data. 6. Selective reporting: reporting bias due to selective outcome reporting. 7. Other bias: bias due to problems not covered elsewhere in the table.

H = high risk of bias; L = low risk of bias; LOE = level of evidence; RCT = randomized controlled trial; U = unclear risk of bias.

**Finally included studies: KQ12**

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<th>Reference No.</th>
<th>Article</th>
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**Evidence table for assessment of risk of bias and quality: KQ12**

<table>
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1. Random sequence generation: selection bias (biased allocation to interventions) due to inadequate generation of a randomized. 2. Allocation concealment: selection bias (biased allocation to interventions) due to inadequate concealment of allocations prior to assignment. 3. Blinding of participants and personnel: performance bias due to knowledge of the allocated interventions by participants and personnel During the study. 4. Blinding of outcome assessment: detection bias due to knowledge of the allocated interventions by outcome assessors. 5. Incomplete outcome data: attrition bias due to amount, nature or handling of incomplete outcome data. 6. Selective reporting: reporting bias due to selective outcome reporting. 7. Other bias: bias due to problems not covered elsewhere in the table.

H = high risk of bias; L = low risk of bias; LOE = level of evidence; RCT = randomized controlled trial.
3. Exercise therapy for cardiac rehabilitation

The following is the common searching strategy for KQ13 (“When should patients begin cardiac rehabilitation after CABG?”) combined with the specific searching strategies for each question shown below:

#1 MeSH descriptor: [Myocardial Ischemia] explode all trees
#2 (myocard* or heart* or coronary or cardia* and (infarct* or isch* or attack*)):ti,ab,kw
#3 ("acute coronary syndrome" or ACS):ti,ab,kw
#4 (angina or stenocardia*):ti,ab,kw
#5 {or #1-#4}
#6 MeSH descriptor: [Cardiac Surgical Procedures] explode all trees
#7 ("coronary artery bypass" or "CABG" or "aortocoronary bypass" or "coronary bypass"):ti,ab,kw
#8 ("coronary" near "artery" near "bypass"):ti,ab,kw
#9 {or #6-#8}
#10 #5 and #9

The following is the specific searching strategy for KQ13-1, “CABG ambulation”:

#11 MeSH descriptor: [Ambulatory Care] explode all trees
#12 MeSH descriptor: [Early Ambulation] explode all trees
#13 (ambulat* or mobili* or gait):ti,ab,kw
#14 {or #11-#13}
#15 #10 and #14

The following is the specific searching strategy for KQ13-2, “CABG aerobic and strengthening”:

#11 MeSH descriptor: [Exercise] explode all trees
#12 MeSH descriptor: [Exercise Therapy] explode all trees
#13 ("exercise*" or "train*" or fitness) and ("strength*" or "aerobic"):ti,ab,kw
#14 (physical near (train* or activ*)):ti,ab,kw
#15 ((physio or physic* or kinesio*) near therap*):ti,ab,kw
#16 (interval or aerobic) near (train* or exercise* or run* or fitness)):ti,ab,kw
#17 ((muscle* or resistan*) near (train* or activ* or strength* or exercise*)):ti,ab,kw
#18 {or #11-#17}
#19 #10 and #18

The following is the specific searching strategy for KQ13-3, “CABG + Stretching”:

#11 MeSH descriptor: [Range of Motion, Articular] explode all trees
#12 (stretch* or flexibilit*):ti,ab,kw
#13 #11 or #12
#14 #10 and #13

The following is the specific searching strategy for KQ13-4, “CABG + Respiration training”:

#11 (respirat* or inspirat*) near (train* or educat* or exercise* or physiotherap*):ti,ab,kw
#12 spiromet*:ti,ab,kw
#13 #11 or #12
#14 #10 and #13
The following is the specific searching strategy for KQ13-5. “CABG + Dysphagia”:

#11 MeSH descriptor: [Deglutition Disorders] explode all trees
#12 (dysphagia or (swallow* near (difficult* or disorder))):ti,ab,kw
#13 #11 or #12
#14 #10 and #13

Flow chart of study selection process

Finally included studies

<table>
<thead>
<tr>
<th>Reference No.</th>
<th>Article</th>
</tr>
</thead>
</table>

SR = systematic reviews.

Evidence table for assessment of risk of bias and quality

Methodological quality of systematic reviews using AMSTAR 2.0 and LOE using SIGN methods

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1. Did the research questions and inclusion criteria for the review include the components of PICO? 2. Did the report of the review contain an explicit statement that the review methods were established prior to the conduct of the review and did the report justify any significant deviations from the protocol? 3. Did the review authors explain
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LOE = level of evidence; N = no; P = partial yes; RoB = risk of bias; SIGN = Scottish Intercollegiate Guidelines Network; SR = systematic reviews; Y = yes.

Methodological quality of systematic reviews using GRADE and LOE using SIGN methods

<table>
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<tbody>
<tr>
<td>No. 1</td>
</tr>
<tr>
<td>SR1</td>
</tr>
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</table>

1. Limitation, 2. Inconsistency, 3. Indirectness, 4. Imprecision, 5. Publication bias, 6. Large magnitude effect, 7. All plausible confounding would reduce a demonstrated effect or suggest a spurious effect when results show no effect, 8. Dose response gradient.

GRADE = grades of recommendation assessment, development and evaluation; LOE = level of evidence; SIGN = Scottish Intercollegiate Guidelines Network; SR = systematic reviews.

The following is the basic searching strategy used for cardiac rehabilitation treatment (KQ 14-18) in the Cochrane Library, combined with the specific searching strategy for each question using AND.

#1 MeSH descriptor: [Myocardial Ischemia] explode all trees
#2 ((myocard* or heart* or coronary or cardia*) and (infarct* or isch* or attack*)):ti,ab,kw
#3 ("acute coronary syndrome" or ACS):ti,ab,kw
#4 (angina or stenocardia*):ti,ab,kw
#5 (or #1-#4)
#6 MeSH descriptor: [Myocardial Revascularization] explode all trees
#7 ((Myocard* or card* or coronary) and (Revascular* or angioplast*)):ti,ab,kw
#8 ((coronary or rotational) near atherectom*):ti,ab,kw
#9 MeSH descriptor: [Percutaneous Coronary Intervention] explode all trees
#10 ("percutaneous coronary intervention*" or PCI):ti,ab,kw
#11 (percutaneous next coronary near/2 (interven* or revascular*)):ti,ab,kw
#12 (stent* and (heart or cardiac*)):ti,ab,kw
The same Cochrane Library searching strategy was used for KQ14 (“Should aerobic exercise be included in the cardiac rehabilitation program?”) and KQ15 (“Should resistance (muscle training) exercise be included in the cardiac rehabilitation program?”) The following is the final searching strategy, including the basic searching strategy for exercise therapy for CR:

**Search strategies**

#20 MeSH descriptor: [Exercise] explode all trees  
#21 MeSH descriptor: [Exercise Therapy] explode all trees  
#22 (("exercise*" or "train*" or fitness) and ("strength*" or "aerobic"):ti,ab,kw  
#23 (physical near (train* or activ*)):ti,ab,kw  
#24 ((physio or physic* or kinesio*) near therap*):ti,ab,kw  
#25 ((interval or aerobic) near (train* or exercise* or run* or fitness)):ti,ab,kw  
#26 ((muscle* or resistan*) near (train* or activ* or strength* or exercise*)):ti,ab,kw  
#27 [or #20-#26]  
#28 #19 and #27

**Flow chart of study selection process: KQ14**

![Flow chart of study selection process: KQ14](chart.png)

**Finally included studies: KQ14**

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<th>Reference</th>
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<tr>
<td>SR1</td>
<td>Chen YC, Tsai JC, Liou YM, Chan P. Effectiveness of endurance exercise training in patients</td>
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'SR = systematic reviews.

**Evidence table for assessment of risk of bias and quality: KQ14**

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LOE = level of evidence; N = no; P = partial yes; RoB = risk of bias; SR = systematic reviews; Y = yes.

**Methodological quality of systematic reviews using GRADE and LOE using SIGN methods**

<table>
<thead>
<tr>
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All plausible confounding would reduce a demonstrated effect or suggest a spurious effect when results show no effect. 8. Dose response gradient.

GRADE = grades of recommendation assessment, development and evaluation; LOE = level of evidence; SIGN = Scottish Intercollegiate Guidelines Network; SR = systematic reviews.

Flow chart of study selection process: KQ15

Finally included studies: KQ15

<table>
<thead>
<tr>
<th>Reference No.</th>
<th>Article</th>
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'SR = systematic reviews.

Evidence table for assessment of risk of bias and quality: KQ15

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LOE = level of evidence; N = no; P = partial yes; RoB = risk of bias; SR = systematic reviews; Y = yes.

Methodological quality of systematic reviews using GRADE and LOE using SIGN methods

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1. Limitation, 2. Inconsistency, 3. Indirectness, 4. Imprecision, 5. Publication bias, 6. Large magnitude effect, 7. All plausible confounding would reduce a demonstrated effect or suggest a spurious effect when results show no effect, 8. Dose response gradient.

GRADE = grades of recommendation assessment, development and evaluation; LOE = level of evidence; SR = systematic reviews.

The following is the final Cochrane Library searching strategy used for KQ16 (“How can the safety of cardiac rehabilitation exercise be enhanced?”) including the basic searching strategy for exercise therapy for CR:
**Searching strategies**

#20 MeSH descriptor: [Cardiac Rehabilitation] explode all trees

#21 (*cardia* or heart*) and *habilitation*:ti,ab,kw

#22 {or #20–#21}

#23 MeSH descriptor: [Wireless Technology] explode all trees

#24 MeSH descriptor: [Electrocardiography] explode all trees

#25 ((electrocardiography or ecg or ekg) near monitor*):ti,ab,kw

#26 MeSH descriptor: [Safety] explode all trees

#27 (safe* or risk):ti,ab,kw

#28 {or #23–#27}

#29 #19 and #22 and #28

**Flow chart of study selection process**

1. Records identified through database searching Cochrane (37), Embase (70), PubMed (156) Total (n=263)
2. Records after duplicates removed (n=85)
3. Records screened on basis of title and abstract (n=85)
4. Full-text articles accessed for eligibility (n=52)
5. Full-text articles excluded, with reasons (n=52)
   1. The patient does not have acute coronary syndrome (n=1)
   2. Literatures irrelevant to the key question (n=33)
   3. Non-human studies (animal study or preclinical studies) (n=0)
   4. Literatures published in languages other than English or Korean (n=0)
   5. Duplicate publication (n=7)
   6. Full text unavailable (n=6)
   7. Other (n=0)
6. Studies included in qualitative synthesis (n=0)

**Finally included studies**

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<th>Article</th>
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The following is the final Cochrane Library searching strategy used for KQ17 (“Can a home-based cardiac rehabilitation program replace a hospital-based cardiac rehabilitation program?”) including the basic searching strategy for exercise therapy for CR:

**Searching strategies**

#20 MeSH descriptor: [Cardiac Rehabilitation] explode all trees

#21 (*cardia* or heart*) and *habilitation*:ti,ab,kw

#22 MeSH descriptor: [Rehabilitation] explode all trees

#23 (rehabilitat* or *habilitation):ti,ab,kw
Flow chart of study selection process

Finally included studies

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<tr>
<th>Reference No.</th>
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SR = systematic reviews.
### Evidence table for assessment of risk of bias and quality: KQ17

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LOE = level of evidence; N = no; P = partial yes; RoB = risk of bias; SR = systematic reviews; Y = yes.

### Methodological quality of systematic reviews using GRADE LOE using SIGN methods

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<td>SR4</td>
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1. Limitation, 2. Inconsistency, 3. Indirectness, 4. Imprecision, 5. Publication bias, 6. Large magnitude effect, 7. All plausible confounding would reduce a demonstrated effect or suggest a spurious effect when results show no effect, 8. Dose response gradient.

GRADE = grades of recommendation assessment, development and evaluation; LOE = level of evidence; SIGN = Scottish Intercollegiate Guidelines Network; SR = systematic reviews.
The following is the final Cochrane Library searching strategy used for KQ18 (“Should cardiac rehabilitation programs be recommended to elderly patients?”) including the basic searching strategy for exercise therapy for CR:

**Searching strategies**

MeSH descriptor: [Cardiac Rehabilitation] explode all trees

#21 (*cardia* or heart*) and *habilitation*:ti,ab,kw

#22 MeSH descriptor: [Rehabilitation] explode all trees

#23 (rehabilitat* or *habilitation):ti,ab,kw

#24 MeSH descriptor: [Physical and Rehabilitation Medicine] explode all trees

#25 MeSH descriptor: [Health Facilities] explode all trees

#26 MeSH descriptor: [Rehabilitation Nursing] explode all trees

#27 {or #20-#26}

#28 MeSH descriptor: [Women] explode all trees

#29 MeSH descriptor: [Aged] explode all trees

#30 (women or woman or female or gender):ti,ab,kw

#31 (old* or elder* or aged):ti,ab,kw

#32 {or #28-#31}

#33 #19 and #27 and #32

**Flow chart of study selection process**

![Flow chart of study selection process](image_url)

Finally included studies

<table>
<thead>
<tr>
<th>Reference No.</th>
<th>Article</th>
</tr>
</thead>
</table>

'SR = systematic reviews.'
### Evidence table for assessment of RoB and quality

Methodological quality of systematic reviews using AMSTAR 2.0 and LOE using SIGN methods

<table>
<thead>
<tr>
<th>Reference No.</th>
<th>Quality items</th>
<th>LOE</th>
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<td>Y   Y   Y   Y   Y   Y   P   Y   Y   Y   Y   Y   Y   Y   Y   1++</td>
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LOE = level of evidence; N = no; P = partial yes; RoB = risk of bias; SIGN = Scottish Intercollegiate Guidelines Network; SR = systematic reviews; Y = yes.

### Methodological quality of systematic reviews using GRADE and LOE using SIGN methods

<table>
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<th>Reference No.</th>
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1. Limitation, 2. Inconsistency, 3. Indirectness, 4. Imprecision, 5. Publication bias, 6. Large magnitude effect, 7. All plausible confounding would reduce a demonstrated effect or suggest a spurious effect when results show no effect, 8. Dose response gradient.

GRADE = grades of recommendation assessment, development and evaluation; LOE = level of evidence; SIGN = Scottish Intercollegiate Guidelines Network; SR = systematic reviews.
4. Education for cardiac rehabilitation

The following is the basic searching strategy commonly used in education for cardiac rehabilitation in the Cochrane Library. This basic searching strategy was combined with the specific searching strategy for each question using AND.

MeSH descriptor: [Myocardial Ischemia] explode all trees
#17 ((myocard* or heart* or coronary or cardia*) and (infarct* or isch* or attack*)):ti,ab,kw
#18 ("acute coronary syndrome" or ACS):ti,ab,kw
#19 (angina or stenocardia*):ti,ab,kw
#20 MeSH descriptor: [Myocardial Revascularization] explode all trees
#21 ((Myocard* or cardi* or coronary) and (Revascular* or angioplast*)):ti,ab,kw
#22 ((coronary or rotational) near atherectom*):ti,ab,kw
#23 ("coronary artery bypass" or CABG or "aortocoronary bypass" or "coronary bypass"):ti,ab,kw
#24 MeSH descriptor: [Percutaneous Coronary Intervention] explode all trees
#25 ("percutaneous coronary intervention*" or PCI):ti,ab,kw
#26 (percutaneous next coronary near/2 (interven* or revascular*)):ti,ab,kw
#27 (stent* and (heart or cardiac*)):ti,ab,kw
#28 coronary near (disease* or bypass or thrombo* or angioplast*):ti,ab,kw
#29 (PTCA or "percutaneous transluminal coronary angioplasty"):ti,ab,kw
#30 MeSH descriptor: [Heart Bypass, Right] explode all trees
#31 ("heart manual"):ti,ab,kw
#32 [or #16-#31]
#33 MeSH descriptor: [Rehabilitation] explode all trees
#34 (rehabilitat* or *habilitation):ti,ab,kw
#35 MeSH descriptor: [Physical and Rehabilitation Medicine] explode all trees
#36 MeSH descriptor: [Health Facilities] explode all trees
#37 MeSH descriptor: [Rehabilitation Nursing] explode all trees
#38 [or #33-#37]
#39 MeSH descriptor: [Cardiac Rehabilitation] explode all trees
#40 ("cardia* or heart*" and *habilitation*):ti,ab,kw
#41 #39 or #40
#42 (#32 and #38) or #41

The following is the final Cochrane Library searching strategy used for KQ19 ("Is patient education necessary as part of cardiac rehabilitation?") including the basic searching strategy for education for secondary prevention:

Searching strategies
#1 MeSH descriptor: [Health Behavior] explode all trees
#2 (health next behaviour* or health next behavior*):ti,ab,kw
#3 MeSH descriptor: [Patient Discharge] explode all trees
#4 ("patient discharge" or discharging next patient*):ti,ab,kw
#5 MeSH descriptor: [Patient Transfer] explode all trees
#6 MeSH descriptor: [Patient Handoff] explode all trees
#7 (handoff or handover or "hand off" or "hand over"):ti,ab,kw
#8 shared care:ti,ab,kw
#9 ("behaviour change" or "behavior change"):ti,ab,kw
#10 (maintenance*):ti,ab,kw
#11 (transition* near/3 care):ti,ab,kw
#12 ("peer support" or "peer mentoring" or peer next counsel*):ti,ab,kw
#13 MeSH descriptor: [Health Education] explode all trees
#14 ("health education"):ti,ab,kw
#15 {or #1-#14}

Flow chart of study selection process

Records identified through database searching Cochrane (31), Embase (217), PubMed (132)
Total (n=380)

Records after duplicates removed (n=359)

Records screened on basis of title and abstract (n=359)

Full-text articles accessed for eligibility (n=9)

Studies included in qualitative synthesis (n=1)

Records excluded (n=350)

Full-text articles excluded, with reasons (n=8)
1. The patient does not have acute coronary syndrome (n=3)
2. Literature irrelevant to the key question (n=2)
3. Non-human studies (animal study or preclinical studies) (n=0)
4. Literature published in languages other than English or Korean (n=0)
5. Duplicate publication (n=0)
6. Full text unavailable (n=1)
7. Other (n=3, not SR)

Finally included studies

<table>
<thead>
<tr>
<th>Reference No.</th>
<th>Article</th>
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SR = systematic reviews.

Evidence table for assessment of risk of bias and quality

Methodological quality of systematic reviews using GRADE and LOE using SIGN methods

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1. Limitation, 2. Inconsistency, 3. Indirectness, 4. Imprecision, 5. Publication bias, 6. Large magnitude effect, 7. All plausible confounding would reduce a demonstrated effect or suggest a spurious effect when results show no effect, 8. Dose response gradient.

GRADE = grades of recommendation assessment, development and evaluation; LOE = level of evidence; SIGN = Scottish Intercollegiate Guidelines Network; SR = systematic reviews.
The following is the final Cochrane Library searching strategy used for KQ20 (“What contents should be included in patient education?”) and KQ21 (“What interventions are needed to boost patients’ drug compliance?”) including the basic searching strategy in education for cardiac rehabilitation:

**Searching strategies**

#1 Medication Adherence*:ti,ab,kw  
#2 medication adj3 (adherence* or "non-adherence" or nonadherence* or "non adherence" or compliance* or non-compliance* or "non compliance" or persistence*):ti,ab,kw  
#3 *Patient Compliance:ti,ab,kw  
#4 MeSH descriptor: [Medication Adherence] explode all trees  
#5 #1 or #2 or #3 or #4

**Flow chart of study selection process**

```
Records identified through database searching
Cochrane (37), Embase (255), PubMed (73)
Total (n=365)
Records after duplicates removed
(n=337)
Records screened on basis of title and abstract
(n=337)
Full-text articles accessed for eligibility
(n=14)
Studies included in qualitative synthesis
(n=6)
Records excluded
(n=323)
```

1. The patient does not have acute coronary syndrome (n=3)  
2. Literature irrelevant to the key question (n=2)  
3. Non-human studies (animal study or preclinical studies) (n=0)  
4. Literature published in languages other than English or Korean (n=0)  
5. Duplicate publication (n=0)  
6. Full text unavailable (n=3)  
7. Other (n=6)

**Finally included studies**

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**Evidence table for assessment of risk of bias and quality**

Methodological quality of systematic reviews using GRADE and LOE using SIGN methods

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1. Limitation, 2. Inconsistency, 3. Indirectness, 4. Imprecision, 5. Publication bias, 6. Large magnitude effect, 7. All plausible confounding would reduce a demonstrated effect or suggest a spurious effect when results show no effect, 8. Dose response gradient.

GRADE = grades of recommendation assessment, development and evaluation; LOE = level of evidence; SIGN = Scottish Intercollegiate Guidelines Network; SR = systematic reviews.

The following is the final Cochrane Library searching strategy used for KQ22 (“What is a good brief intervention for patients who need to quit smoking?”) including the basic searching strategy for education for cardiac rehabilitation:

**Searching strategies**

#1  brief smoking cessation:ti,ab,kw
#2  (brief intervention* near/4 smoking):ti,ab,kw
#3  (brief near/3 smoking cessation):ti,ab,kw
#4  #1 or #2 or #3
#5  MeSH descriptor: [Tobacco Use Cessation] explode all trees
#6  MeSH descriptor: [Tobacco Use] explode all trees
#7  ((smok* or tobacco or cigar* or nicotine) near/3 (quit* or stop* or ceas* or cessation)):ti,ab,kw
#8  MeSH descriptor: [Tobacco Use Disorder] explode all trees
#9  MeSH descriptor: [Tobacco Products] explode all trees
#10 #6 or #8 or #9
#11  (quit* or stop* or ceas* or cessation):ti,ab,kw
#12 #10 and #11
#13 #5 or #7 or #12
**Flow chart of study selection process**

Records identified through database searching: Cochrane (8), Embase (42), PubMed (22)
Total (n=72)

Records after duplicates removed (n=67)

Records screened on basis of title and abstract (n=67)

Full-text articles accessed for eligibility (n=4)

Studies included in qualitative synthesis (n=1)

Records excluded (n=63)

Full-text articles excluded, with reasons (n=3)
1. The patient does not have acute coronary syndrome (n=1)
2. Literatures irrelevant to the key question (n=0)
3. Non-human studies (animal study or preclinical studies) (n=0)
4. Literatures published in languages other than English or Korean (n=0)
5. Duplicate publication (n=0)
6. Full text unavailable (n=0)
7. Other (n=2, not 50)

**Finally included studies**

<table>
<thead>
<tr>
<th>Reference No.</th>
<th>Article</th>
</tr>
</thead>
</table>

SR = systematic reviews.

**Evidence table for assessment of risk of bias and quality**

Methodological quality of systematic reviews using GRADE and LOE using SIGN methods

<table>
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<tr>
<th>Reference No.</th>
<th>1</th>
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<td>Very low (1)</td>
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</tr>
</tbody>
</table>

1. Limitation, 2. Inconsistency, 3. Indirectness, 4. Imprecision, 5. Publication bias, 6. Large magnitude effect, 7. All plausible confounding would reduce a demonstrated effect or suggest a spurious effect when results show no effect, 8. Dose response gradient.

GRADE = grades of recommendation assessment, development and evaluation; LOE = level of evidence; SR = systematic reviews.

KQ23. Should a specific food supplement be recommended for patients undergoing cardiac rehabilitation? For KQ24-1, omega-3: The following searching strategy was used without combining the common searching strategy:
Searching strategies

#1 (omega-3 or "omega 3") .ti,ab.
#2 MeSH descriptor: [Fatty Acids, Omega-3] explode all trees
#3 #1 or #2
#4 MeSH descriptor: [Myocardial Ischemia] explode all trees
#5 ((myocard* or heart* or coronary or cardia*) and (infarct* or isch* or attack*)):ti,ab,kw
#6 ("acute coronary syndrome" or ACS):ti,ab,kw
#7 (angina or stenocardia*):ti,ab,kw
#8 MeSH descriptor: [Myocardial Revascularization] explode all trees
#9 ((Myocard* or cardi* or coronary) and (Revascular* or angioplast*)):ti,ab,kw
#10 ((coronary or rotational) near atherectomy*):ti,ab,kw
#11 ("coronary artery bypass" or CABG or "aortocoronary bypass" or "coronary bypass"):ti,ab,kw
#12 MeSH descriptor: [Percutaneous Coronary Intervention] explode all trees
#13 ("percutaneous coronary intervention*" or PCI):ti,ab,kw
#14 (percutaneous next coronary near/2 (interven* or revascular*)):ti,ab,kw
#15 (stent* and (heart or cardiac*)):ti,ab,kw
#16 coronary near (disease* or bypass or thrombo* or angioplast*):ti,ab,kw
#17 (PTCA or "percutaneous transluminal coronary angioplasty"):ti,ab,kw
#18 MeSH descriptor: [Heart Bypass, Right] explode all trees
#19 ("heart manual"):ti,ab,kw
#20 {or #4–#19}
#21 #3 and #20

Flow chart of study selection process

Finally included studies

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<thead>
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<th>No.</th>
<th>Article</th>
</tr>
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</table>
Evidence table for assessment of risk of bias and quality: KQ24-1
Methodological quality of systematic reviews using GRADE and LOE using SIGN methods

<table>
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<tr>
<th>Reference No.</th>
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1. Limitation, 2. Inconsistency, 3. Indirectness, 4. Imprecision, 5. Publication bias, 6. Large magnitude effect, 7. All plausible confounding would reduce a demonstrated effect or suggest a spurious effect when results show no effect, 8. Dose response gradient.

GRADE = grades of recommendation assessment, development and evaluation; LOE = level of evidence; SIGN = Scottish Intercollegiate Guidelines Network; SR = systematic reviews.

For KQ24-2, policosanol: Only policosanol was used for the search due to a lack of relevant literature.

Searching strategies

#1 (policosanol or polycosanol).ti,ab.

Flow chart of study selection process

Finally included studies
**Evidence table for assessment of risk of bias and quality**

**RCTs**

<table>
<thead>
<tr>
<th>Reference No.</th>
<th>Quality items</th>
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</thead>
<tbody>
<tr>
<td>RCT1</td>
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<td>RCT2</td>
<td>L U H L L L</td>
<td>1+</td>
</tr>
<tr>
<td>RCT3</td>
<td>U U U U U L</td>
<td>1-</td>
</tr>
</tbody>
</table>

1. Random sequence generation: selection bias (biased allocation to interventions) due to inadequate generation of a randomized. 2. Allocation concealment: selection bias (biased allocation to interventions) due to inadequate concealment of allocations prior to assignment. 3. Blinding of participants and personnel: performance bias due to knowledge of the allocated interventions by participants and personnel during the study. 4. Blinding of outcome assessment: detection bias due to knowledge of the allocated interventions by outcome assessors. 5. Incomplete outcome data: attrition bias due to amount, nature or handling of incomplete outcome data. 6. Selective reporting: reporting bias due to selective outcome reporting. 7. Other bias: bias due to problems not covered elsewhere in the table.

L = low risk of bias; LOE = level of evidence; H = high risk of bias; RCT = randomized control trials; U = unclear risk of bias.

For KQ24-3, antioxidants: The following searching strategy was used without combining the common searching strategy:

**Searching strategies**

#1 antioxidant
#2 MeSH descriptor: [Antioxidants] explode all trees
#3 {or #1-#2}
#4 MeSH descriptor: [Myocardial Ischemia] explode all trees
#5 ((myocard* or heart* or coronary or cardia*) and (infarct* or isch* or attack*)):ti,ab,kw
#6 ("acute coronary syndrome" or ACS):ti,ab,kw
#7 (angina or stenocardia*):ti,ab,kw
#8 MeSH descriptor: [Myocardial Revascularization] explode all trees
#9 ((Myocard* or cardi* or coronary) and (Revascular* or angioplast*)):ti,ab,kw
#10 ((coronary or rotational) near atherectom*):ti,ab,kw
#11 ("coronary artery bypass" or CABG or "aortocoronary bypass" or "coronary bypass"):ti,ab,kw
#12 MeSH descriptor: [Percutaneous Coronary Intervention] explode all trees
#13 ("percutaneous coronary intervention*" or PCI):ti,ab,kw
#14 (percutaneous next coronary near/2 (interven* or revascular*)):ti,ab,kw
#15 (stent* and (heart or cardiac*)):ti,ab,kw
#16 coronary near (disease* or bypass or thrombo* or angioplast*):ti,ab,kw
#17 (PTCA or "percutaneous transluminal coronary angioplasty"):ti,ab,kw
#18 MeSH descriptor: [Heart Bypass, Right] explode all trees
#19 ("heart manual"):ti,ab,kw
#20 {or #4 -#19}
#21 #3 and #20

Flow chart of study selection process

Records identified through database searching
Cochrane (58), Embase (253), PubMed (34)
Total (n=345)

Records after duplicates removed
(n=326)

Records screened on basis of title and abstract
(n=326)

Full-text articles accessed for eligibility
(n=13)

Studies included in qualitative synthesis
(n=3)

Records excluded
(n=313)

Full-text articles excluded, with reasons (n=10)
1. The patient does not have acute coronary syndrome (n=1)
2. Literature irrelevant to the key question (n=6)
3. Non-human studies (animal study or preclinical studies) (n=0)
4. Literature published in languages other than English or Korean (n=0)
5. Duplicate publication (n=0)
6. Full-text unavailable (n=3)
7. Other (n=0)

Finally included studies

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**Evidence table for assessment of risk of bias and quality**

Methodological quality of systematic reviews using GRADE and LOE using SIGN methods

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<td>High (4)</td>
<td>1++</td>
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GRADE = grades of recommendation assessment, development and evaluation; LOE = level of evidence; SIGN = Scottish Intercollegiate Guidelines Network; SR = systematic reviews.

The following is the final Cochrane Library searching strategy used for KQ25 (“Would ICT-based modality be helpful in maintaining the effects of education in the long-term?”) including the basic searching strategy for education for cardiac rehabilitation:

**Searching strategies**

#1 MeSH descriptor: [Social Media] explode all trees
#2 (social next medi*):ti,ab,kw
#3 (twitter or facebook):ti,ab,kw
#4 (web next 2* or web2*):ti,ab,kw
#5 (or #1-#4)
#6 pedometer*:ti,ab,kw
#7 (activity monitor* or activity track* or acceleromet* or fitness monitor* or fitness track*):ti,ab,kw
#8 (fitbit or fitband or "fit band" or fitness next watch*):ti,ab,kw
#9 (or #6-#8)
#10 MeSH descriptor: [Mobile Applications] explode all trees
#11 (mobile app* or portable electronic app* or portable software app*):ti,ab,kw
#12 (virtual realit* or exergam* or exer gam* or wifit or wi fit):ti,ab,kw
#13 (or #10-#12)
#14 (interactive near/2 (technol* or software)):ti,ab,kw
#15 (or #14)
#16 MeSH descriptor: [Telemedicine] explode all trees
#17 (telehealth* or tele-health* or telemedicine* or tele-medicine*):ti,ab,kw
#18 (mhealth or m-health or mobile next health*):ti,ab,kw
#19 (or #16-#18)
#20 #5 or #9 or #13 or #15 or #19
Flow chart of study selection process

Finally included studies

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Evidence table for assessment of risk of bias and quality

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GRADE = grades of recommendation assessment, development and evaluation; LOE = level of evidence; SIGN = Scottish Intercollegiate Guidelines Network; SR = systematic reviews.
*Korean literature search and selection*

Korean literatures were searched on RISS, KMbase, and KoreaMed, using terms “심장재활” and “cardiac rehabilitation.”

**Flow chart of study selection process**

1. PubMed search
   1.1 Guidelines in PubMed were searched using the term “cardiac rehabilitation.”
       Search "cardiac rehabilitation"[TIAB] OR "cardiac rehabilitation"[MeSH] Filters: Consensus Development Conference; Guideline; NIH; Practice Guideline
       PubMed date: February 2, 2018
       Search results: 86

   1.2 Guidelines in PubMed were searched using specific key terms such as “myocardial infarction.”
       Search "cardiac rehabilitation"[TIAB] OR "cardiac rehabilitation"[MeSH] Filters: Consensus Development Conference; Guideline; NIH; Practice Guideline
       PubMed date: February 2, 2018
       Search results: 68 → 22 were selected after reviewing the title and abstract

2. Review the reference lists of two recent systemic reviews of cardiac rehabilitation guidelines
   2.1 Abel et al. article: 59 articles
       Abell, Bridget, Paul Glasziou, and Tammy Hoffmann. "Exploration of the methodological quality

2.2 Seron article: 9 articles

3. Search of the database recorded in the guideline Search term: “cardiac rehabilitation”
Search date: January 15, 2018

<table>
<thead>
<tr>
<th>No.</th>
<th>Guideline</th>
<th>Homepage URL</th>
<th>Search results</th>
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<tbody>
<tr>
<td>1</td>
<td>National Electronic Library for Health guidelines finder</td>
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</tr>
<tr>
<td>2</td>
<td>National guidelines clearinghouse</td>
<td><a href="https://www.guideline.gov">https://www.guideline.gov</a></td>
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<td>4</td>
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<td>6</td>
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