INPLASY PROTOCOL

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Review Stage at time of this submission: **The review has not yet started.**

Conflicts of interest: **No.**

Effects of cardiac rehabilitation on atrial fibrillation recurrence, mortality, hospitalization, and exercise capacity: a systematic review and meta-analysis

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Review question / Objective: **The specific aims of this review were to investigate if cardiac rehabilitation reduces the risk of atrial fibrillation recurrence, mortality and hospitalization of patients with atrial fibrillation.**
Condition being studied: **A massive amount of evidence supports that exercise-based cardiac rehabilitation(CR) is beneficial for patients with atrial fibrillation. A Cochrane review in 2017 found that exercise-based rehabilitation programmes targeted at AF (atrial fibrillation) patients significantly increased their exercise capacity compared with control. Another study, published by Smart et al, showed that exercise capacity, cardiac function, symptom burden and health-related quality of life were improved with exercise-based CR in the short term (up to 6 months) targeted at patients with AF. Results reported from Luo et al study displayed that the exercise training may increase the risk of atrial fibrillation recurrence. According to findings reported by Risom et al, there was no significant difference between cardiac rehabilitation and control groups in atrial fibrillation recurrence. Rienstra et al observed cardiac rehabilitation reduces the risk of AF recurrence.**

INPLASY registration number: This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 01 June 2020 and was last updated on 30 December 2025 (registration number INPLASY202060003).

INTRODUCTION

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METHODS

Search strategy: A systematic literature search was conducted for articles in PubMed, EMBASE and the Cochrane Library from January 1, 1980 to August 1, 2025. Key search words included the following: 'risk factor' OR 'cardiac rehabilitation' OR 'cardiovascular rehabilitation' OR 'targeted therapy' OR 'exercise' OR 'sport' OR 'train' AND 'atrial fibrillation'. In addition, the retrieved previous Cochrane Reviews were carefully reviewed to identify their included literature one by one, and articles that met the following criteria were included in our statistics.

Participant or population: The inclusion criteria for our analysis were as follows: (i) Randomized controlled trials (RCTs) (ii) permanent or nonpermanent AF(atrial fibrillation)patients;(iii) an cardiac rehabilitation intervention group was allocated to perform exercise training or risk factor management ;(iv) the control group received usual care and instruction to continue their regular exercise habits.(v) study outcome: the number of patients with atrial fibrillation recurrence , All-cause mortality, hospitalization, and 6 min walk distance.

Intervention: Cardiac rehabilitation (exercise or risk management).

Comparator: Usual care and instruction to continue their regular exercise habits.

Study designs to be included: Randomized controlled trials.

Eligibility criteria: The inclusion criteria for our analysis were as follows: (i) Randomized controlled trials (RCTs) (ii) permanent or nonpermanent AF(atrial fibrillation)patients;(iii) an cardiac rehabilitation intervention group was allocated to perform exercise training or risk factor management ;(iv) the control group received usual care and instruction to continue their regular exercise habits.(v) study outcome: the number of patients with atrial fibrillation recurrence , All-cause mortality, hospitalization, and 6 min walk distance.

Information sources: We will search Pubmed,Embase and Cochrane Library.

Main outcome(s): The number of patients with atrial fibrillation recurrence, All-cause mortality, hospitalization, and 6 min walk distance.

Quality assessment / Risk of bias analysis: Two review authors independently will assess risk of bias of included studies using the Cochrane Collaboration Tool.

Strategy of data synthesis: Statistical analyses were performed using Revman V.5.3(The Nordic Cochrane Centre, Copenhagen, Denmark).Risk ratios(RRs) were calculated for meta-analysis of binary data and mean baseline follow-up change and weighted mean difference(WMD) were used for meta-analysis of continuous data. We assessed heterogeneity using the I^2 statistic. We interpreted an I2 estimate of at least 50% and a statistically significant Chi2 statistic as evidence of a substantial problem with heterogeneity. A fixed effects

meta-analysis model was used when there was evidence of no statistical heterogeneity (ie, I2 statistic≤50%) and a random effects inverse variance model was used when the I2 statistic >50%. We judged the statistical significance based on 5% level of significance and reported pooled mean results with 95% CIs. Visual inspection of funnel plots was used to assess the risk of publication bias.

Subgroup analysis: We had planned to perform subgroup analyses.

Sensibility analysis: For the primary outcomes, we plan to perform sensitivity analyses.

Language: English, Russian.

Country(ies) involved: Denmark, Japan, Netherlands, UK, USA, Australia, South Korea, Germany, Russian.

Keywords: cardiac rehabilitation, atrial fibrillation, mortality, hospitalization, meta-analysis.

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Contributions of each author: T S and C S contributed to the conception or design of the work, the analysis or interpretation of data, and writing of the review. The development of the selection criteria was primarily done by GH L , DJ L, and GY W, YM J contributed to the bias assessment strategy. CY M and L Q verified the analytical methods. L Z and YQ S provided statistical expertise.

Review Stage at time of this submission 30 December 2025: The review has been completed.