

# Clinical Trial Protocol

## Iranian Registry of Clinical Trials

10 Jun 2026

### The effect of different respiratory rehabilitation protocols on cardiac recovery and hemodynamic parameters before and after coronary artery bypass graft surgery (CABG).

#### Protocol summary

##### Study aim

Investigating the effect of different respiratory rehabilitation protocols on cardiac recovery and hemodynamic parameters before and after coronary artery bypass graft surgery (CABG).

##### Design

Clinical trial with control group, unblinded, randomized, with parallel groups, on 75 patients. A table of random numbers was used for randomization.

##### Settings and conduct

This study is carried out as a clinical trial on 75 patients who are candidates for coronary artery bypass surgery, referring to Masih Deneshvari Hospital in Tehran, Iran. Patients who meet the study entry criteria will be placed in one of the study groups after providing full explanations and signing a written consent form.

##### Participants/Inclusion and exclusion criteria

Inclusion criteria include all patients who are candidates for coronary artery bypass surgery, exclusion criteria include age over 70 years, left main coronary artery (LMCA) lesion, history of MI, chest pain during exercise, and ECG changes during exercise.

##### Intervention groups

The first group includes patients who do not receive respiratory rehabilitation exercises before and after surgery (control group). The second group includes patients who perform respiratory rehabilitation exercises only after surgery. The third group includes patients who perform respiratory rehabilitation exercises before and after surgery.

##### Main outcome variables

Cardiac output, end-diastolic volume, end-systolic volume, left ventricular dimensions at the end of diastole, left ventricular dimensions at the end of systole, left ventricular extensor index, 6-minute walking test distance, resting heart rate, oxygen saturation at rest, maximum heart rate, VO<sub>2</sub> max, fatigue level during

activity, dyspnea

#### General information

##### Reason for update

##### Acronym

##### IRCT registration information

IRCT registration number: **IRCT20230417057933N1**

Registration date: **2023-04-27, 1402/02/07**

Registration timing: **prospective**

Last update: **2023-04-27, 1402/02/07**

Update count: **0**

##### Registration date

2023-04-27, 1402/02/07

##### Registrant information

##### Name

Zargham\_Hossein Ahmadi

##### Name of organization / entity

##### Country

Iran (Islamic Republic of)

##### Phone

+98 21 2712 2002

##### Email address

zarghamahmadi@hotmail.com

##### Recruitment status

**Recruitment complete**

##### Funding source

##### Expected recruitment start date

2023-05-22, 1402/03/01

##### Expected recruitment end date

2023-11-22, 1402/09/01

##### Actual recruitment start date

empty

##### Actual recruitment end date

empty

**Trial completion date**

empty

**Scientific title**

The effect of different respiratory rehabilitation protocols on cardiac recovery and hemodynamic parameters before and after coronary artery bypass graft surgery (CABG).

**Public title**

The effect of different respiratory rehabilitation protocols in patients undergoing coronary artery bypass graft surgery (CABG).

**Purpose**

Supportive

**Inclusion/Exclusion criteria****Inclusion criteria:**

All Coronary artery patients candidate for Coronary Artery Bypass Graft (CABG) surgery

**Exclusion criteria:****Age**

To **70 years** old

**Gender**

Both

**Phase**

N/A

**Groups that have been masked**

*No information*

**Sample size**

Target sample size: **75**

**Randomization (investigator's opinion)**

Randomized

**Randomization description**

Simple randomization method, individual randomization unit and random number table randomization tool. For randomization, we use a table consisting of random digits from 0 to 9. Each of the figures in this table is repeated the same on average. In this method, each figure is assigned to a treatment group. We start from the first row of the table and move down row by row. For three groups, we put numbers 1 to 3 for the first group, numbers 4 to 6 for the second group, and numbers 7 to 9 for the third group. We continue the above process until three groups are completed.

**Blinding (investigator's opinion)**

Not blinded

**Blinding description****Placebo**

Not used

**Assignment**

Parallel

**Other design features****Secondary Ids**

empty

**Ethics committees****1****Ethics committee****Name of ethics committee**

Ethics Committee of Shahid Beheshti University of Medical Sciences

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Shahid Abbas Arabi St., Yemen St., Shahid Chamran Highway

**City**

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**Province**

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**Postal code**

1956944413

**Approval date**

2023-04-07, 1402/01/18

**Ethics committee reference number**

IR.SBMU.NRITLD.REC.1402.002

**Health conditions studied****1****Description of health condition studied**

Coronary artery bypass surgery

**ICD-10 code**

I25.709

**ICD-10 code description**

Atherosclerosis of coronary artery bypass graft(s), unspecified, with unspecified angina pectoris

**Primary outcomes****1****Description**

Cardiac output

**Timepoint**

At the beginning of hospitalization, 2 weeks after rehabilitation, after surgery, 2 weeks after surgery

**Method of measurement**

Eco cardiography

**2****Description**

End-diastolic volume

**Timepoint**

At the beginning of hospitalization, 2 weeks after rehabilitation, after surgery, 2 weeks after surgery

**Method of measurement**

Eco cardiography

**3****Description**

Resting heart rate

**Timepoint**

At the beginning of hospitalization, 2 weeks after rehabilitation, after surgery, 2 weeks after surgery

**Method of measurement**

Cardiopulmonary exercise test

## 4

### **Description**

VO2 max

### **Timepoint**

At the beginning of hospitalization, 2 weeks after rehabilitation, after surgery, 2 weeks after surgery

### **Method of measurement**

Cardiopulmonary exercise test

## 5

### **Description**

Fatigue during activity

### **Timepoint**

At the beginning of hospitalization, 2 weeks after rehabilitation, after surgery, 2 weeks after surgery

### **Method of measurement**

Borg scale

## 6

### **Description**

Dyspnea

### **Timepoint**

At the beginning of hospitalization, 2 weeks after rehabilitation, after surgery, 2 weeks after surgery

### **Method of measurement**

Dyspnea index

## **Secondary outcomes**

empty

## **Intervention groups**

### 1

#### **Description**

Control group: In this group, patients do not receive respiratory rehabilitation exercises before and after surgery.

#### **Category**

Other

### 2

#### **Description**

Intervention group: Patients in this group perform respiratory rehabilitation exercises only after surgery (moderate intensity interval training (MIIT)). The training of this group will include 5 minutes of warming up and 28 minutes of intermittent activity (4 minutes of activity with an intensity of 70% of maximum oxygen consumption and 3 minutes of activity with 30% of maximum oxygen consumption) and 5 minutes of cooling down.

#### **Category**

Rehabilitation

### 3

#### **Description**

Intervention group: In this group of patients, before and after surgery, they perform respiratory rehabilitation exercises (high intensity interval training (HIIT)). The training of this group includes 5 minutes of warm-up and 28 minutes of intermittent activity (4 minutes of activity with an intensity of 85% maximum oxygen consumption and 3 minutes of activity with 30% of maximum oxygen consumption) and 5 minutes of cooling.

#### **Category**

Rehabilitation

## **Recruitment centers**

### 1

#### **Recruitment center**

##### **Name of recruitment center**

Masih Daneshvari Hospital

##### **Full name of responsible person**

Zargham Hosein Ahmadi

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## **Sponsors / Funding sources**

### 1

#### **Sponsor**

##### **Name of organization / entity**

Shahid Beheshti University of Medical Sciences

##### **Full name of responsible person**

Afshin Zarghi

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#### **Grant name**

#### **Grant code / Reference number**

#### **Is the source of funding the same sponsor organization/entity?**

Yes

#### **Title of funding source**

Shahid Beheshti University of Medical Sciences  
**Proportion provided by this source**  
100  
**Public or private sector**  
Public  
**Domestic or foreign origin**  
Domestic  
**Category of foreign source of funding**  
*empty*  
**Country of origin**  
**Type of organization providing the funding**  
Academic

## Person responsible for general inquiries

### Contact

**Name of organization / entity**  
Shahid Beheshti University of Medical Sciences  
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## Person responsible for scientific inquiries

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## Person responsible for updating data

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## Sharing plan

### Deidentified Individual Participant Data Set (IPD)

Undecided - It is not yet known if there will be a plan to make this available

### Study Protocol

Undecided - It is not yet known if there will be a plan to make this available

### Statistical Analysis Plan

Undecided - It is not yet known if there will be a plan to make this available

### Informed Consent Form

Undecided - It is not yet known if there will be a plan to make this available

### Clinical Study Report

Undecided - It is not yet known if there will be a plan to make this available

### Analytic Code

Undecided - It is not yet known if there will be a plan to make this available

### Data Dictionary

Undecided - It is not yet known if there will be a plan to make this available