

# Clinical Trial Protocol

## Iranian Registry of Clinical Trials

10 Jun 2026

### Comparison of high-intensity interval training and moderate-intensity continuous training models on cardiac rehabilitation indices and electrical activity after coronary artery bypass surgery

#### Protocol summary

##### Study aim

Comparison of high-intensity and moderate-intensity continuous training models on rehabilitation of cardiac patients after coronary artery bypass surgery

##### Design

clinical trial with control group , with parallel group, single-blind, randomized with computer and on 18 patients

##### Settings and conduct

This study is performed in the heart clinics of Shiraz in Iran by selecting the three groups that mentioned. After selection, patients will be examined by electrocardiography and cardiac stress test and will be engaged in exercises for 6 weeks, and then electrocardiography and exercise test will be repeated. .

##### Participants/Inclusion and exclusion criteria

Male and female gender, sinus rhythm, left ventricular ejection fraction 50% or higher, and 4 to 16 weeks after CABG

##### Intervention groups

The study will consist of three groups, two groups under the intervention of exercise program under two protocols: MICE protocol, (Moderate intensity continuous training) Includes 3 sessions of 45-minute workouts with an intensity of 70% of the heart rate reserve in each week. it s done for 6 weeks. At the beginning and end of each training session, the patient will warm up and cool down HIIT protocol ( high intensity interval training) Warm up 9 time repetition of 2-minute training with an intensity of 90-85% of the heart rate reserve and with an active rest period of 2 minutes between them with Intensity of 70-60% of stored heart rate cool down Control group They will be selected from those who do not do a cardiac rehabilitation exercise program

##### Main outcome variables

Main out come variables consists: Heart rate variability (HRV); QT interval in electrocardiogram; T wave

alternans in electrocardiogram; VO2PEAK

#### General information

##### Reason for update

##### Acronym

##### IRCT registration information

IRCT registration number: **IRCT20220326054352N1**

Registration date: **2022-03-31, 1401/01/11**

Registration timing: **prospective**

Last update: **2022-03-31, 1401/01/11**

Update count: **0**

##### Registration date

2022-03-31, 1401/01/11

##### Registrant information

##### Name

Emad Jowharishirazi

##### Name of organization / entity

##### Country

Iran (Islamic Republic of)

##### Phone

+98 71 3627 6693

##### Email address

emad.jsh@gmail.com

##### Recruitment status

**Recruitment complete**

##### Funding source

##### Expected recruitment start date

2022-05-22, 1401/03/01

##### Expected recruitment end date

2022-06-22, 1401/04/01

##### Actual recruitment start date

empty

##### Actual recruitment end date

empty

**Trial completion date**

empty

**Scientific title**

Comparison of high-intensity interval training and moderate-intensity continuous training models on cardiac rehabilitation indices and electrical activity after coronary artery bypass surgery

**Public title**

Comparison of high and moderate intensity cardiac rehabilitation after CABG

**Purpose**

Supportive

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

Male and female gender, sinus rhythm, EF 50% or higher and 4 to 16 weeks after CABG

**Exclusion criteria:**

Includes peripheral vascular disease, valvular disease, PVC PAC RYTHM, conduction defects diabetes, 160/90 mm Hg, limited neurological features And orthopedics related to exercise, discontinuation of medication during the study

**Age**

From **35 years** old to **60 years** old

**Gender**

Both

**Phase**

N/A

**Groups that have been masked**

- Data analyser

**Sample size**

Target sample size: **18**

**Randomization (investigator's opinion)**

Randomized

**Randomization description**

The randomization method will be such that the study population is from one of the most busiest heart clinics in Shiraz and patients should refer to it after surgery. then the subjects will be divided into 4 groups, based on women between 35 and 50, men between 35 and 50, men between 50 and 60, and women between 50 and 60. Then, 4 people will be selected by simple classified sampling for each group . then, one person will be selected from that four participant for each of the sports protocol groups randomly and through a lottery by unknown balls. Two people will also join the control group. Obviously, the randomization unit is individual. Classified randomization will be done after determining the groups by Excel software. the results of the lottery, which will be based on the protocol and control groups and the personnel code, will be given to the participants in an sealed envelope.

**Blinding (investigator's opinion)**

Single blinded

**Blinding description**

data analyser will be blind with coding the data

**Placebo**

Not used

**Assignment**

Parallel

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

empty

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

Ethics committee of Shiraz University of Medical Sciences

**Street address**

No32, 49/4Ave, Ghasroddasht street

**City**

Shiraz

**Province**

Fars

**Postal code**

7183783384

**Approval date**

2019-07-03, 1398/04/12

**Ethics committee reference number**

IR.SUMS.MED.REC.1398.246

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

Coronary artery disease, coronary artery stenosis, cardiac rehabilitation, CABG, post CABG complication

**ICD-10 code**

I25.1

**ICD-10 code description**

Atherosclerotic heart disease of native coronary artery

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

Vo2peak(maximum oxygen uptake)

**Timepoint**

before and after intervention

**Method of measurement**

indirectly by cardiac stress test

**2****Description**

Heart rate variability

**Timepoint**

before and after intervention

**Method of measurement**

Electrocardiography

### 3

**Description**

QT interval

**Timepoint**

before and after intervention

**Method of measurement**

Electrocardiography

### 4

**Description**

T wave alternans

**Timepoint**

before and after intervention

**Method of measurement**

Electrocardiography

## Secondary outcomes

empty

## Intervention groups

### 1

**Description**

Intervention group:1:"MICE protocol, (Moderate intensity continuous training) Includes 3 sessions of 45-minute workouts with an intensity of 70% of the heart rate reserve in each week .it s done for 6 weeks. At the beginning and end of each training session, the patient will warm up and cool down for 5 minutes with an intensity of 50-55% of The heart rate reserve

**Category**

Rehabilitation

### 2

**Description**

Intervention group: 2:" HIIT protocol ( high intensity interval training)Warm up for 5 minutes with an intensity of 60-50% of heart rate reserve2 9 time repetition of 2-minute training with an intensity of 90-85% of the heart rate reserve and with an active rest period of 2 minutes between them with Intensity of 70-60% of stored heart rate5 minutes with an intensity of 60-50% of the heart rate reserve for cooling down

**Category**

Rehabilitation

### 3

**Description**

Control group: No intervention

**Category**

N/A

## Recruitment centers

### 1

**Recruitment center****Name of recruitment center**

Imam Reza clinic

**Full name of responsible person**

Emad Jowhari Shirazi

**Street address**

Namazi square

**City**

Shiraz

**Province**

Fars

**Postal code**

7134814734

**Phone**

+98 71 3627 6693

**Email**

emad.jsh@gmail.com

## Sponsors / Funding sources

### 1

**Sponsor****Name of organization / entity**

Shiraz University of Medical Sciences

**Full name of responsible person**

DR.Mahtab Meamarpoor

**Street address**

Shiraz medical university, Zand university

**City**

Shiraz

**Province**

Fars

**Postal code**

7134814336

**Phone**

+98 71 3212 2430

**Email**

vcrdep@sums.ac.ir

**Grant name****Grant code / Reference number****Is the source of funding the same sponsor organization/entity?**

Yes

**Title of funding source**

Shiraz University of Medical Sciences

**Proportion provided by this source**

50

**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**

Shiraz University of Medical Sciences

**Full name of responsible person**

Emad Jowharishirazi

**Position**

Intern

**Latest degree**

A Level or less

**Other areas of specialty/work**

Cardiology

**Street address**

No,32 49/4Ave ,Ghasroddasht street

**City**

Shiraz

**Province**

Fars

**Postal code**

7183783384

**Phone**

+98 71 3627 6693

**Fax****Email**

emad.jsh@gmail.com

m.babaee.med@gmail.com

**Person responsible for updating data****Contact****Name of organization / entity**

Shiraz University of Medical Sciences

**Full name of responsible person**

Prof. mohammad ali babaee beygi

**Position**

cardiology professor

**Latest degree**

Subspecialist

**Other areas of specialty/work**

Cardiology

**Street address**

Cardiovascular group Office of Shiraz University of Medical Sciences, Al-Zahra Hospital, Sibouyeh Blvd

**City**

Shiraz

**Province**

Fars

**Postal code**

5493771649

**Phone**

+98 71 3739 8811

**Fax****Email**

m.babaee.med@gmail.com

**Person responsible for scientific inquiries****Contact****Name of organization / entity**

Shiraz University of Medical Sciences

**Full name of responsible person**

Prof. mohammad ali babaee beygi

**Position**

cardiology professor

**Latest degree**

Subspecialist

**Other areas of specialty/work**

Cardiology

**Street address**

Cardiovascular group Office of Shiraz University of Medical Sciences, Al-Zahra Hospital, Sibouyeh Blvd

**City**

Shiraz

**Province**

Fars

**Postal code**

5493771649

**Phone**

+98 71 3739 8811

**Fax****Email****Sharing plan****Deidentified Individual Participant Data Set (IPD)**

No - There is not a plan to make this available

**Justification/reason for indecision/not sharing IPD**

There is no further information

**Study Protocol**

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

**Statistical Analysis Plan**

No - There is not a plan to make this available

**Informed Consent Form**

No - There is not a plan to make this available

**Clinical Study Report**

No - There is not a plan to make this available

**Analytic Code**

No - There is not a plan to make this available

**Data Dictionary**

No - There is not a plan to make this available