

# Clinical Trial Protocol

## Iranian Registry of Clinical Trials

26 Jun 2026

### The effect of cerebellum transcranial direct current stimulation on implicit motor learning in healthy older adults

#### Protocol summary

##### Summary

The purpose of the present study was to investigate the efficiency of trans-cranial direct current stimulation (TDCS) application over the cerebellum region on implicit motor learning in healthy older adults. This study has clinical trial design. Participants will be randomly allocated in to two groups included; Group I who received 20 minutes TDCS over the cerebellum region and Group II who served as placebo group (mounted TDCS electrodes over the cerebellum region without any TDCS currents for 2 minutes). The healthy older participants with 60-80 years with right dominant hand will be included. Participants who have history of neurological diseases or musculoskeletal disorders, severe perceptual and memorial problems, brain diseases, visual and auditory problems, upper extremity pathology and range of motion limitation will be excluded. All participants will be asked to perform a serial reaction time task (SRTT) during TDCS treatment. The SRTT will be repeated for 35 minutes and then two days after applying TDCS. Decreasing reaction time of the SRTT in the first session will be considered as the online learning and in the second and third sessions as the offline learning. Accordingly, the obtained data will be analyzed.

#### General information

##### Acronym

##### IRCT registration information

IRCT registration number: **IRCT2015112321294N2**  
Registration date: **2016-03-07, 1394/12/17**  
Registration timing: **registered\_while\_recruiting**

Last update:

Update count: **0**

##### Registration date

2016-03-07, 1394/12/17

#### Registrant information

##### Name

Fatemeh Ehsani

##### Name of organization / entity

Semnan University of Medical Sciences

##### Country

Iran (Islamic Republic of)

##### Phone

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##### Email address

f.ehsani@semums.ac.ir

#### Recruitment status

##### Recruitment complete

#### Funding source

Vice chancellor for research, Semnan University of Medical Sciences, Semnan, Iran.

#### Expected recruitment start date

2016-02-29, 1394/12/10

#### Expected recruitment end date

2016-06-30, 1395/04/10

#### Actual recruitment start date

empty

#### Actual recruitment end date

empty

#### Trial completion date

empty

#### Scientific title

The effect of cerebellum transcranial direct current stimulation on implicit motor learning in healthy older adults

#### Public title

The effect of cerebellum transcranial direct current stimulation on implicit motor learning in healthy older adults

#### Purpose

Treatment

#### Inclusion/Exclusion criteria

Inclusion criteria: Participants who have 60-80 years old

and their right hand is dominant hand, will be concluded. Exclusion criteria: Participants had no history of neurological diseases or musculoskeletal disorders; Adults with severe perceptual and memory problems evidenced by Mini Mental Status Examination (MMSE) scores of less than 21; having neurological disease, especially Parkinson and Alzheimer's; having visual or auditory problems; having upper extremity pathology and range of motion limitations will be excluded from the study.

**Age**

From **60 years** old to **80 years** old

**Gender**

Both

**Phase**

2

**Groups that have been masked**

*No information*

**Sample size**

Target sample size: **30**

**Randomization (investigator's opinion)**

Randomized

**Randomization description****Blinding (investigator's opinion)**

Single blinded

**Blinding description****Placebo**

Used

**Assignment**

Parallel

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

empty

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

Ethics committee of Semnan University of Medical Science

**Street address**

5 kilometer in Damghan Road, Semnan Iran

**City**

Semnan

**Postal code****Approval date**

2016-02-09, 1394/11/20

**Ethics committee reference number**

IR.SEMUMS.REC.1394.171

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

-

**ICD-10 code**

-

**ICD-10 code description**

-

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

Reaction time

**Timepoint**

Before, 35 minute and two days after intervention

**Method of measurement**

Color Matching Test Software

**Secondary outcomes****1****Description**

Error meaning

**Timepoint**

Before, 35 minute and two days after intervention

**Method of measurement**

Color Matching Test Software

**Intervention groups****1****Description**

Intervention group: Before using TDCS, the participants will be asked to do SRT task containing 2 blocks. Then, anodal and cathodal electrodes will be positioned on cerebellum and ipsi-lateral deltoid muscle, respectively. Stimulation will be used with 2 Mili Ampere intensity for 20-minute. The participants concurrently will be asked to do SRT task containing 8 blocks. The participants will be asked to repeat doing SRT task containing 2 blocks, 35 minute and two days after TDCS intervention.

**Category**

Other

**2****Description**

Control group: Before using sham-TDCS, the participants will be asked to do SRT task containing 2 blocks. Then, anodal and cathodal electrodes will be positioned on cerebellum and ipsi-lateral deltoid muscle, respectively. Stimulation will be used with 2 Mili Ampere intensity for 2-minute. The participants concurrently will be asked to do SRT task containing 8 blocks. The participants will be asked to repeat doing SRT task containing 2 blocks, 35 minute and two days after sham-TDCS intervention.

**Category**

Other

**Recruitment centers**

## 1

### Recruitment center

**Name of recruitment center**

Neuromuscular Rehabilitation Research Center

**Full name of responsible person**

Fatemeh Ehsani

**Street address**

Mashahir Square, Blvd. Ghods, Semnan

**City**

Semnan

### Sponsors / Funding sources

## 1

#### Sponsor

**Name of organization / entity**

Vice Chancellor for research of Semnan University of  
Medical Sciences

**Full name of responsible person**

Dr. Ali Rashidipoor

**Street address**

Vice Chancellor for research of Semnan University of  
Medical Sciences, Blvd. Basig, Semnan

**City**

Semnan

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

Yes

**Title of funding source**

Vice Chancellor for research of Semnan University of  
Medical Sciences

**Proportion provided by this source**

100

**Public or private sector**

*empty*

**Domestic or foreign origin**

*empty*

**Category of foreign source of funding**

*empty*

**Country of origin****Type of organization providing the funding**

*empty*

### Person responsible for general inquiries

**Contact****Name of organization / entity**

Neuromuscular Rehabilitation Research Center

**Full name of responsible person**

Fatemeh Ehsani

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lecturer and researcher

**Other areas of specialty/work****Street address**

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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)**

*empty*

**Study Protocol**

*empty*

**Statistical Analysis Plan**

*empty*

**Informed Consent Form**

*empty*

**Clinical Study Report**

*empty*

**Analytic Code**

*empty*

**Data Dictionary**

*empty*