

Clinical Trial Protocol

Iranian Registry of Clinical Trials

17 Jun 2026

Comparison of the radial artery catheterization success rates of first-year anesthesia residents who had or had not received ultrasonography practice.

Protocol summary

Study aim

This study was performed to evaluate the effect of ultrasound training on the quality of radial artery catheterization in anesthesia residents.

Design

A clinical trial with a control group, with parallel, randomized groups, on 320 patients. For randomization, the permuted block randomization method will use quadratic blocks.

Settings and conduct

The patients were admitted to the operating room of the educational hospital and after randomization and general anesthesia, the resident corresponding to the patient group (the resident group with ultrasound experience or the resident group without ultrasound experience) placed the patient's wrist in the appropriate position and proceeded to Sterilization. Then this resident inserts the catheter into the artery at an angle of 30 degrees. At the same time, time recording is done using a stopwatch by the anesthesiologist in charge of the patient. After inserting the catheter and confirming its position with the return of pulsatile blood, the time recording ends. The catheter is fixed using suitable tape. The time spent, the success of the procedure, the number of catheters used, and possible complications are recorded in the questionnaire.

Participants/Inclusion and exclusion criteria

All patients older than 18 years who need arterial blood pressure monitoring for elective surgeries and have no contraindications for radial artery catheterization, who are admitted to the operating room at the time of the study.

Intervention groups

In the patients of the intervention group, catheterization will be performed by palpation method by residents who have learned this task with ultrasound. In the control group, catheterization by the palpation method will be

performed by residents who have learned it by tactile method and have no experience working with ultrasound.

Main outcome variables

Success rate in the first attempt

General information

Reason for update

Acronym

IRCT registration information

IRCT registration number: **IRCT20120910010800N5**

Registration date: **2022-08-12, 1401/05/21**

Registration timing: **prospective**

Last update: **2022-08-12, 1401/05/21**

Update count: **0**

Registration date

2022-08-12, 1401/05/21

Registrant information

Name

Dariush Abtahi

Name of organization / entity

Country

Iran (Islamic Republic of)

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Recruitment status

Recruitment complete

Funding source

Expected recruitment start date

2022-08-19, 1401/05/28

Expected recruitment end date

2023-02-16, 1401/11/27

Actual recruitment start date

empty

Actual recruitment end date

empty

Trial completion date

empty

Scientific title

Comparison of the radial artery catheterization success rates of first-year anesthesia residents who had or had not received ultrasonography practice.

Public title

Comparison of the radial artery catheterization success rates of first-year anesthesia residents who had or had not received ultrasonography practice.

Purpose

Treatment

Inclusion/Exclusion criteria**Inclusion criteria:**

Patients older than 18 years
Classification of patients' physical status according to the American Society of Anesthesiologists (ASA) one and two
Need to monitor arterial blood pressure for elective surgery

Exclusion criteria:

Dissatisfaction with participating in the study
Existence of any skin inflammation near the catheter entry site
Previous surgery near the catheter entrance
Abnormal result of the modified Allen test
History of radial artery catheterization in the past month
History of peripheral artery disease

Age

From **18 years** old

Gender

Both

Phase

N/A

Groups that have been masked

- Participant
- Investigator

Sample size

Target sample size: **320**

Randomization (investigator's opinion)

Randomized

Randomization description

Patients are selected for each resident by available sampling method. Patients are assigned to one of the two methods of palpation and radial artery catheterization based on the randomization sequence prepared using PASS software using the randomization method with permutation blocks with a block size of 4 with allocation (2x2). In randomization, each resident is considered as a stratum. Allocation of patients with this method will be done by an anesthesiologist who will not be involved in the next stages of the research and before the patient enters the operating room by opening the non-transparent sealed envelope containing the name of the group.

Blinding (investigator's opinion)

Double blinded

Blinding description

An anesthesia technician, who will not play a role in the research, will open an opaque sealed envelope based on a random sequence generated by the software during the patient's admission to the operating room and inform the responsible anesthesiologist. The anesthesiologist will call the resident associated with the patient group to perform catheterization and record the results of the resident's work. Then, without informing the main researcher, this information will be delivered to the statistical consultant of the project to be recorded in the statistical software.

Placebo

Not used

Assignment

Parallel

Other design features**Secondary Ids**

empty

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

Research Ethics Committees of Vice-Chancellor in Research Affairs - Shahid Beheshti University of Me

Street address

Emam Hossein Hospital, Shahid Madani St.

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Postal code

1617763141

Approval date

2018-09-30, 1397/07/08

Ethics committee reference number

IR.SBMU.REC.1397.010

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

Increase the success rate of radial artery catheterization

ICD-10 code

4A133B1

ICD-10 code description

Monitoring of Arterial Pressure, Peripheral, Percutaneous Approach

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

Success rate in the first attempt

Timepoint

The first 5 minutes of catheterization

Method of measurement

Measuring time and observing the success of anesthesia resident performance in radial artery catheterization by an anesthesiologist

Secondary outcomes

1

Description

Final success rate

Timepoint

During catheterization time

Method of measurement

An anesthesiologist observes the performance of the anesthesia resident

2

Description

The time taken to complete the catheterization

Timepoint

During catheterization time

Method of measurement

Measurement with a stopwatch by an anesthesiologist

Intervention groups

1

Description

Intervention group: Ten residents who each experienced ultrasound-guided catheterization in 16 patients in the first phase of the study will use the palpation method of radial artery catheterization in 16 other patients.

Category

Treatment - Devices

2

Description

Control group: Ten residents who each experienced the use of the palpation method in 16 patients in the first phase of the study will again use the palpation method for radial artery catheterization in 16 additional patients.

Category

N/A

Recruitment centers

1

Recruitment center

Name of recruitment center

Hospital Emam Hossein

Full name of responsible person

Dariush Abtahi

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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

Street address

Tehran Province, Tehran, Velenjak, 7th Floor, Bldg No.2 SBUMS, Arabi Ave

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Intl_office@sbmu.ac.ir

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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

Full name of responsible person

Dariush Abtahi

Position

Assistant Professor

Latest degree

Specialist

Other areas of specialty/work

Anesthesiology

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

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Full name of responsible person

Dariush Abtahi

Position

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

Shahid Beheshti University of Medical Sciences

Full name of responsible person

Dariush Abtahi

Position**Sharing plan****Deidentified Individual Participant Data Set (IPD)**

Yes - There is a plan to make this available

Study Protocol

Yes - There is 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

Yes - There is a plan to make this available

Clinical Study Report

Yes - There is 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

Title and more details about the data/document

All data is potentially shareable after unidentified individuals.

When the data will become available and for how long

One year after the publication of the article.

To whom data/document is available

All jobs

Under which criteria data/document could be used

All non-personal patient information (anonymously) can be accessed by contacting the responsible author.

From where data/document is obtainable

Email to: drdariushabtahi@yahoo.com

What processes are involved for a request to access data/document

Sending email and review by the responsible author

Comments