

# Real-world performance evaluation of PreSize Neurovascular medical software in a clinical setting

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| <b>Submission date</b><br>28/01/2022   | <b>Recruitment status</b><br>No longer recruiting | <input checked="" type="checkbox"/> Prospectively registered<br><input type="checkbox"/> Protocol                       |
| <b>Registration date</b><br>12/05/2022 | <b>Overall study status</b><br>Completed          | <input type="checkbox"/> Statistical analysis plan<br><input type="checkbox"/> Results                                  |
| <b>Last Edited</b><br>23/01/2026       | <b>Condition category</b><br>Circulatory System   | <input type="checkbox"/> Individual participant data<br><input checked="" type="checkbox"/> Record updated in last year |

## Plain English summary of protocol

### Background and study aims

Stenting is a common treatment for cardiovascular (heart) diseases, such as aneurysms. Stents are small spring-like metallic structures used to strengthen weak blood vessels or open them up when they become clogged. The shape and size of each blood vessel is different so there are many different stents for the doctor to choose from.

The success of the stenting procedure depends on the right fit of the stent in the affected blood vessel. Currently, it is difficult for doctors to predict which stent will give a good fit from looking at the standard brain scans. A company called Oxford Heartbeat has built a computer software (a computer program) called PreSize Neurovascular that can be used by doctors to plan the procedure and help them choose the 'best fit' stent for each patient by creating an accurate 3D image of their blood vessels in the brain.

PreSize Neurovascular software has demonstrated high accuracy in calculating the size of the required stent based on patients' brain scans.

This study tries to understand the benefits of this computer program when used by doctors to help them plan for brain stenting surgeries and how well it works in real-world clinical practice. Oxford Heartbeat will work with hospitals in England and Scotland to collect this information over a period of about 16 months from approximately 100 patients.

### Who can participate?

Patients aged 18 years and above who are scheduled to receive treatment for an intracranial aneurysm with one of the flow diverters compatible with PreSize Neurovascular at one of the participating NHS sites.

### What does the study involve?

In this study, the patient will not be asked to do anything that is not already part of their usual treatment. The doctor will plan the stenting procedure using their standard method, and then by using the PreSize Neurovascular computer program. The program will prepare a computer model of the patient's blood vessels in the brain based on the scans done in preparation for the procedure. The doctor will practice fitting different stents on the computer model. Once both planning methods are complete your doctor will decide at their own discretion which stent to

use based on either the standard method or the computer program method. After the procedure, the patient will continue to receive the usual treatment as prescribed by the doctor. If the patient agrees to participate, the study doctor and nurses will collect information about their medical care for study analysis, but no information that could identify the patient (e.g., name, NHS number).

What are the possible benefits and risks of participating?

Patients may not benefit directly from participating in this study. With the help of this study, however, the aim is to gain further insights into how future patient outcomes could be improved and NHS costs reduced through the use of the computer software.

Where is the study run from?

There are participating hospitals across the UK (England, Wales and Scotland). The trial is run from Imperial College Trials Unit and Oxford Heartbeat, the company that developed the software, both based in London, UK.

When is the study starting and how long is it expected to run for?

June 2020 to July 2025

Who is funding the study?

National Institute for Health Research (NIHR) (UK)

Who is the main contact?

Investigators and NHS Trusts wishing to express interest in participating in this study please contact [presize@imperial.ac.uk](mailto:presize@imperial.ac.uk)

Patients who would like to get more information on participation in the study please contact Chief Investigator Dr Tufail Patankar ([tufail.patankar@nhs.net](mailto:tufail.patankar@nhs.net))

## Contact information

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Scientific

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## Additional identifiers

**Clinical Trials Information System (CTIS)**

Nil known

**Integrated Research Application System (IRAS)**

296470

**ClinicalTrials.gov (NCT)**

Nil known

**Protocol serial number**

CPMS 50137, IRAS 296470

## Study information

**Scientific Title**

Real-world performance evaluation of PreSize Neurovascular medical software in a clinical setting

**Acronym**

PreSize Neurovascular

**Study objectives**

PreSize Neurovascular is accurate at simulating stent length when the software is used under real-world conditions and contributes to improved clinical care by increasing surgical efficiency (e.g. by minimising device waste or reducing procedure and planning time).

**Ethics approval required**

Old ethics approval format

**Ethics approval(s)**

Approved 22/08/2021, North of Scotland Research Ethics Service (Summerfield House, 2 Eday Road, Aberdeen, AB15 6RE, UK; +44 (0)1224 558458; gram.nosres@nhs.scot), REC ref: 21/NS/0104

**Study design**

Non-randomized; Interventional; Design type: Treatment, Process of Care, Device, Imaging, Surgery

## **Primary study design**

Interventional

## **Study type(s)**

Treatment

## **Health condition(s) or problem(s) studied**

Intracranial aneurysm

## **Interventions**

Study design: Post-market, multi-centre, prospective, non-randomised study

Summary of the study procedures:

Study interventional neuroradiologists (INRs) will plan flow diverter (FD) brain stenting procedures on prospectively identified participants using two methods: first using their usual methods, and then using PreSize Neurovascular software. The brain stenting procedures will be conducted as they usually would be but informed by the planning conducted using PreSize Neurovascular. Study participants will be followed-up after 6 months (as well as after 1 year, where possible considering duration of the whole study).

The study will also involve the collection of data on historical cases performed by the participating INRs as a benchmark for the outcomes collected during this study, as well as assessment of INRs feedback regarding the use of software.

The feedback will be collected using the survey and 1-2 interviews with each INR.

Sample size: 100 participants

Cohort: patients undergoing treatment of an intracranial aneurysm with one of the FDs compatible with PreSize Neurovascular software.

## **Intervention Type**

Other

## **Primary outcome(s)**

1. PreSize Neurovascular accuracy at simulating stent length when the software is used in real clinical practice. Accuracy will be assessed by comparing the simulated deployed stent length estimated by PreSize Neurovascular software using pre-operative imaging and the observed deployed stent length from post-operative imaging.

## **Key secondary outcome(s)**

1. Discrepancy in stent devices (make, length, diameter) selected when at the pre-operative planning stage INRs use traditional planning methods versus when they use PreSize Neurovascular
2. INR satisfaction with the software measured using post-procedural short periodic surveys and qualitative interviews with each INR
3. Planning duration when INRs use traditional planning methods versus when they use PreSize Neurovascular software. The planning duration for the two approaches will be recorded in real-time at the pre-operative stage.
4. Procedure duration and radiation dose during the procedure in cases planned with PreSize

Neurovascular. Duration will be measured by timestamps in intra-operative imaging and radiation dose will be recorded post-procedure. The same measures will be collected from historical data from past procedures.

5. Intra-operative corrections, defined as devices deployed additionally and discarded as well as manual manipulations by INRs due to suboptimal stent fit observed in cases planned using PreSize Neurovascular. The corrections will be recorded post-procedure. The same measures will be collected from historical data from past procedures.

**Completion date**

31/07/2025

## Eligibility

**Key inclusion criteria**

1. Adults aged 18 years or above
2. Indicated to receive treatment for an intracranial aneurysm with one of the FDs compatible with PreSize Neurovascular at one of the participating NHS sites
3. Able to receive both pre-operative 3D rotational angiography (3DRA) and post-operative 2D digital subtraction angiography (2DSA) or cone-beam computed tomography (CT), excluding allergy to iodinated contrast media

**Participant type(s)**

Patient

**Healthy volunteers allowed**

No

**Age group**

Mixed

**Lower age limit**

18 years

**Upper age limit**

150 years

**Sex**

All

**Total final enrolment**

103

**Key exclusion criteria**

1. Any reasons in the opinion of the investigator, e.g. patient cases previously fitted with coiling in the same aneurysmal area might be deemed inappropriate for the purposes of this study if it significantly impacts the contrast in the pre-operative X-ray imaging
2. Unable to give informed consent

**Date of first enrolment**

04/08/2022

**Date of final enrolment**

31/07/2024

**Locations****Countries of recruitment**

United Kingdom

England

Scotland

Wales

**Study participating centre****Leeds General Infirmary**

Great George Street

Leeds

England

LS1 3EX

**Study participating centre****St Georges**

St. Georges Hospital

117 Suttons Lane

Hornchurch

England

RM12 6RS

**Study participating centre****Royal Preston Hospital**

Sharoe Green Lane North

Fulwood

Preston

England

PR2 9HT

**Study participating centre****Royal Infirmary of Edinburgh**

51 Little France Crescent

Old Dalkeith Road

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Lothian

Scotland  
EH16 4SA

**Study participating centre**  
**National Hospital for Neurology & Neurosurgery**  
Queen Square  
London  
England  
WC1N 3BG

**Study participating centre**  
**The Walton Centre**  
Lower Lane  
Fazakerley  
Liverpool  
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**Study participating centre**  
**Queen Elizabeth University Hospital**  
1345 Govan Road  
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G51 4TF

**Study participating centre**  
**Queens Hospital**  
Rom Valley Way  
Romford  
England  
RM7 0AG

**Study participating centre**  
**Cardiff & Vale University Health Board**  
Heath Park  
Cardiff  
Wales  
CF14 4XW

# Sponsor information

## Organisation

Oxford Heartbeat Ltd

## Funder(s)

### Funder type

Government

### Funder Name

National Institute for Health Research

### Alternative Name(s)

National Institute for Health Research, NIHR Research, NIHRresearch, NIHR - National Institute for Health Research, NIHR (The National Institute for Health and Care Research), NIHR

### Funding Body Type

Government organisation

### Funding Body Subtype

National government

### Location

United Kingdom

# Results and Publications

## Individual participant data (IPD) sharing plan

### IPD sharing plan summary

Data sharing statement to be made available at a later date

### Study outputs

| Output type                                   | Details                       | Date created | Date added | Peer reviewed? | Patient-facing? |
|---|-------------------------------|--------------|------------|----------------|-----------------|
| <a href="#">HRA research summary</a>          |                               |              | 28/06/2023 | No             | No              |
| <a href="#">Participant information sheet</a> | Participant information sheet | 11/11/2025   | 11/11/2025 | No             | Yes             |