

# Platelet function in patients undergoing major, non-cardiac, vascular surgery

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<b>Registration date</b> 14/04/2022	<b>Overall study status</b> Completed	<input type="checkbox"/> Statistical analysis plan <input type="checkbox"/> Results
<b>Last Edited</b> 11/09/2023	<b>Condition category</b> Surgery	<input type="checkbox"/> Individual participant data <input type="checkbox"/> Record updated in last year

## Plain English summary of protocol

### Background and study aims

Many patients who require major operations on the blood vessels (vascular surgery) are taking antiplatelet medications. On the day of surgery, they may require an epidural for pain relief. An epidural is an injection in the back that blocks the nerves carrying pain from the area being operated on. It is generally a safe procedure that provides excellent pain relief. One rare risk is bleeding into the injection site, which can have potentially devastating complications such as paralysis. Bleeding into the epidural injection site is estimated to occur in 1 in every 150,000 cases. The risk is thought to be higher in patients who are on antiplatelet medications and therefore guidelines recommend stopping some antiplatelet medications for between 5 and 7 days before an epidural injection. However, this is not based on high-quality research and stopping these medications, even for a brief period, can result in patients being at higher risk of stroke or heart attack. However, little is known about how individual people respond to these medications. Some research suggests that antiplatelet medications may not work in a third of patients. Epidural analgesia may be a suitable option for these patients. Expert committees have called for more research on identifying these patients. The aim of this study is to better understand the true effects that antiplatelet medication has on circulating platelets in the blood.

### Who can participate?

Patients aged 18 years and over who are scheduled to undergo major vascular surgery at the John Radcliffe Hospital, Oxford

### What does the study involve?

The researchers will require two to three teaspoons of blood from the participants. This blood would be taken during routine pre-operative assessment clinic visits and again on the day of surgery. No drugs will be given as part of the study and the remainder of the study data will be collected from routine healthcare records.

### What are the possible benefits and risks of participating?

Participants may not directly benefit from this study but the information and knowledge gained from this study has the potential to help future patients who will undergo vascular surgery.

Taking the blood samples may cause some discomfort, bruising of very minor bleeding. If this happens, it can easily be treated by applying pressure on the site where blood was taken from and taking simple painkillers if required.

Where is the study run from?  
John Radcliffe Hospital (UK)

When is the study starting and how long is it expected to run for?  
September 2020 to June 2023

Who is funding the study?  
National Institute of Academic Anaesthesia (NIAA) (UK)

Who is the main contact?  
Dr Akshay Shah.  
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## Contact information

### Type(s)

Principal investigator

### Contact name

Dr Akshay Shah

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## Additional identifiers

### Clinical Trials Information System (CTIS)

Nil known

### Integrated Research Application System (IRAS)

302883

### ClinicalTrials.gov (NCT)

Nil known

### Protocol serial number

## Study information

### Scientific Title

PLatelet fUnction in patients undergoinG major, non-cardiac, vascular Surgery (PLUGS) – a prospective cohort study

### Acronym

PLUGS

### Study objectives

To characterise platelet function, using the TEG6S assay, in patients scheduled to undergo elective major, non-cardiac vascular surgery.

### Ethics approval required

Old ethics approval format

### Ethics approval(s)

Approved 20/12/2021, West Midlands - Solihull Research Ethics Committee (West Midlands - Solihull Research Ethics Committee, Equinox House, City Link, Nottingham, NG2 4LA, UK; +44 (0) 207 104 8191, +44 (0)207 104 8310; solihull.rec@hra.nhs.uk), ref: 21/WM/0254

### Study design

Prospective observational cohort study

### Primary study design

Observational

### Study type(s)

Other

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

Participants scheduled to undergo elective, major non-cardiac, vascular surgery

### Interventions

The aim of this study is to better understand the true effects that antiplatelet medication has on circulating platelets in the blood. The researchers will use novel methods of analysing platelet function. They will aim to recruit 80 patient participants across four study groups who are scheduled to undergo major vascular surgery at the John Radcliffe Hospital, Oxford and who are taking:

1. Aspirin only
2. Clopidogrel only
3. Dual antiplatelets
4. No antiplatelets (control group)

There is a growing body of evidence evaluating the relationship between measured platelet function and bleeding in patients on clopidogrel, or similar agents undergoing non-cardiac surgery. However, patient compliance with antiplatelet therapy was not reported in these studies. The gold standard method of assessing platelet function is light transmission

aggregometry, but this is a time-consuming, labour-intensive method and requires a large volume of blood in comparison with other methods. Thromboelastography 6S (TEG6S) provides near-patient, real-time information on the viscoelastic properties of clot formation, along with information on platelet mapping and percentage inhibition, and has been approved for clinical use.

TEG6 assays will be run in accordance with the manufacturer's guidelines by a trained member of the research team in the operating theatres of the John Radcliffe Hospital, OUHFT. These will be run within 20-40 minutes of being taken. They will require two to three teaspoons of blood from patients who have agreed to take part. This blood would be taken during routine pre-operative assessment clinic visits and again on the day of surgery. No drugs will be given as part of the study and the remainder of the study data will be collected from routine healthcare records.

## **Intervention Type**

Other

## **Primary outcome(s)**

1. Percentage of patients with antiplatelet drug resistance at initial presentation to the Pre-operative Assessment Clinic and on the morning of surgery. For aspirin group (i), drug resistance will be defined as an arachidonic acid (AA)-induced platelet-fibrin clot strength (MAAA) >47 mm plus an AA-induced platelet inhibition rate < 50%. For P2Y12 inhibitors (clopidogrel) group (ii), drug resistance will be defined as an adenosine diphosphate (ADP)-induced platelet-fibrin clot strength (MAADP) >47 mm plus an ADP-induced platelet inhibition rate < 50%
2. Percentage of patients with platelet inhibition measured using the TEG6S assay on the morning of surgery

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

1. Proportion of patients who self-report as being compliant with antiplatelet medications preoperatively. Compliance will be defined as taking >80% of prescribed doses as prescribed.
2. Peri-operative blood loss, changes in haemoglobin concentration and transfusion requirements measured using routine healthcare records in the first 24 hours in the first 24 hours
3. Return to theatre for bleeding in the first 24 hours and/or graft/stent thrombosis measured using routine healthcare records in the first 24 hours
4. Peri-operative thrombotic events measured using routine healthcare records within 30 days of surgery
5. Bleeding complications associated with regional anaesthesia measured using routine healthcare records at 30 days
6. Days-alive-and-out-of-hospital at 30 days (DAOH-30) measured using routine healthcare records

## **Completion date**

30/06/2023

## **Eligibility**

### **Key inclusion criteria**

1. Participant is willing and able to give informed consent for participation in the study
2. Aged 18 years or above
3. Scheduled to undergo major non-cardiac vascular surgery (including, but not restricted to, abdominal aortic aneurysm (open or endovascular), carotid endarterectomy, lower limb arterial

revascularisation)

4. For participants taking antiplatelet therapy: (i) aspirin alone, (ii) clopidogrel alone or (iii) dual antiplatelet therapy groups, at least 7 days of prescribed antiplatelet therapy prior to study recruitment. Patients who are on other antiplatelet therapy, but from the same therapeutic class as either aspirin or clopidogrel, will be allocated to that particular group.

5. Participants in the control group (iv) should not have been on any antiplatelet therapy

### **Participant type(s)**

Patient

### **Healthy volunteers allowed**

No

### **Age group**

Adult

### **Lower age limit**

18 years

### **Upper age limit**

110 years

### **Sex**

All

### **Key exclusion criteria**

1. Congenital/inherited bleeding disorders
2. Haemodialysis-dependent chronic kidney disease
3. Enrolled into a study where an intervention may affect platelet function – this would be discussed on a case-by-case basis between the study Chief Investigators

### **Date of first enrolment**

09/06/2022

### **Date of final enrolment**

15/05/2023

## **Locations**

### **Countries of recruitment**

United Kingdom

England

### **Study participating centre**

**John Radcliffe Hospital**

Headley Way

Headington

Oxford

United Kingdom  
OX3 9DU

## Sponsor information

### Organisation

University of Oxford

### ROR

<https://ror.org/052gg0110>

## Funder(s)

### Funder type

Government

### Funder Name

National Institute of Academic Anaesthesia

### Alternative Name(s)

NIAA

### Funding Body Type

Government organisation

### Funding Body Subtype

Local government

### Location

United Kingdom

## Results and Publications

### Individual participant data (IPD) sharing plan

The data-sharing plans for the current study are unknown and will be made available at a later date

### 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?
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<a href="#">HRA research summary</a>			28/06/2023	No	No
<a href="#">Protocol file</a>	version 4.0	08/02/2023	11/09/2023	No	No