

Comparing two methods of estimating the severity of individual narrowings in heart arteries, when there is more than one narrowing

Submission date 06/05/2021	Recruitment status No longer recruiting	<input checked="" type="checkbox"/> Prospectively registered <input type="checkbox"/> Protocol
Registration date 14/05/2021	Overall study status Completed	<input checked="" type="checkbox"/> Statistical analysis plan <input checked="" type="checkbox"/> Results
Last Edited 17/07/2025	Condition category Circulatory System	<input type="checkbox"/> Individual participant data

Plain English summary of protocol

Background and study aims

Angina and heart attacks are caused by narrowings within blood vessels supplying the heart. Individual narrowings that need treatment are usually identified by making an educated guess of the effect that each will have on blood flow, based on the appearance of the artery on an angiogram (an invasive x-ray procedure that involves injecting dye into each heart artery). However, doctors can now accurately determine the effect of a narrowing on blood flow using a pressure wire to measure fractional flow reserve (FFR) or instantaneous flow reserve (iFR) during the angiogram.

People who have blockages in the blood vessels in their heart are often offered a stent procedure. Research has shown that stent procedures are generally safe, prevent future heart problems and can improve people's symptoms. In a significant number of patients, the blood vessel supplying the heart (also known as coronary arteries) has more than one narrowing. In this situation it can be difficult to know which of the two or more narrowings require stenting. This study will investigate how accurate pressure wire measurement guided predictions are at determining the severity of each narrowing in a coronary artery.

Who can participate?

Patients are invited to join the trial if they are either scheduled to have a coronary angiogram which may show narrowings that require stenting, or have had an angiogram that demonstrated they have narrowings of the blood vessels in their heart and they need a stent procedure.

What does the study involve?

This study will involve 130 people having stent procedures. In order to make a fair comparison between the two commonly used pressure wire measurement methods (FFR and iFR), the researchers will perform both measurements in all patients. Patient management will be guided by one of these pressure wire methods, either FFR or iFR, this will be decided at random (like tossing a coin). The decision will not be made by the doctor.

What are the possible benefits and risks of participating?

There are no direct benefits from taking part in this study over the usual standard clinical care of

the patient's condition. The researchers will obtain very useful information from taking the extra measurements in the catheter laboratory using the pressure wires. The information from this study might help improve the treatment of patients with coronary artery disease in the future. Patients will not be paid for participating in the study.

As part of this study, the researchers will use an additional pressure wire (already used in clinical practice) to make additional recordings to normal care during which they will also be using a drug called adenosine. Therefore, if patients take part in this study, these additional recordings for research will result in their catheter laboratory procedure being lengthened by about 5 to 10 minutes with a small increase in time (no more than 1-2 minutes) exposed to the adenosine infusion but with no significant increase in the risk of the procedure. This increased procedural time will result in increased ionising radiation (X-ray) dose.

Where is the study run from?

Guy's and St Thomas' NHS Foundation Trust and Kings College London (UK)

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

September 2020 to August 2025

Who is funding the study?

Abbott Vascular (USA) with an unrestricted research grant to King's College London (UK)

Who is the main contact?

Dr Matthew Li Kam Wa

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Contact information

Type(s)

Scientific

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293563

Study information

Scientific Title

Systematic Evaluation by Randomisation of Intracoronary physiological techniques for Assessing tandem Lesions (SERIAL)

Acronym

SERIAL

Study objectives

To compare the accuracy of two different systems (that are routinely used clinically) for estimating the significance of individual lesions in serially diseased coronary arteries.

Ethics approval required

Ethics approval required

Ethics approval(s)

approved 17/08/2021, Wales Research Ethics Committee 1 (Health & Care Research Wales, Castlebridge 4, 15-19 Cowbridge Road East, Cardiff, CF11 9AB, United Kingdom; +44 (0)1792 606334; Wales.REC1@wales.nhs.uk), ref: 21/WA/0238

Study design

Prospective multi-centre cluster randomized study

Primary study design

Interventional

Study type(s)

Diagnostic

Health condition(s) or problem(s) studied

Coronary artery disease (CAD) with serial stenoses

Interventions

Randomisation will be stratified block randomisation with varying block sizes via the King's College London Clinical Trials Unit online portal. Blocks will be stratified by age and sex.

CAD with serial lesions will be assessed systematically in the same patient by the use of two intracoronary pressure sensing guide wires. In this way, both instantaneous wave free flow reserve (iFR) pullback Scout (Volcano Phillips) and fractional flow reserve (FFR) pullback solution (Abbott/Coroventis) can be compared. The operator will base medical strategy on the randomised modality only and be blinded to results from the non-randomised system.

Intervention Type

Device

Phase

Not Applicable

Drug/device/biological/vaccine name(s)

iFR Pullback (Volcano Phillips), FFR Pullback (Abbott/Coroventis)

Primary outcome(s)

The accuracy of iFR Pullback (Volcano Phillips) and FFR Pullback (Abbott/Coroventis) at predicting the final Fractional Flow Reserve (ratio of distal and aortic pressures) after treatment of one lesion in serial coronary artery disease, measured using physiological intracoronary pressure measurements taken during an angioplasty procedure (baseline)

Key secondary outcome(s)

Secondary efficacy outcomes:

Change in management strategy following full physiological evaluation of serial coronary artery disease, assessed by operator questionnaire responses during the procedure (baseline)

Secondary exploratory outcomes:

Major adverse cardiovascular events (target vessel revascularisation, myocardial infarction, stroke, death), obtained through follow-up telephone calls at 30 days and 1 year

Completion date

01/08/2025

Eligibility

Key inclusion criteria

Current participant inclusion criteria as of 14/07/2021:

1. A focal lesion on angiography (at least 50% diameter stenosis) in a coronary artery
2. One of the following:
 - 2.1. A second focal lesion (at least 50% diameter stenosis) which the operator would consider treating with separate (non-overlapping) stents
 - 2.2. A segment of diffuse disease
3. Target vessel diameter of at least 2.5 mm, suitable for passing a pressure wire

Previous participant inclusion criteria:

1. A focal lesion on angiography (at least 50% diameter stenosis) in a coronary artery and either a second focal lesion (at least 50% diameter stenosis) or a segment of diffuse disease, which the operator would consider treating with separate (non-overlapping) stents
2. A vessel diameter of at least 2.5 mm, suitable for passing a pressure wire

Participant type(s)

Patient

Healthy volunteers allowed

No

Age group

Adult

Lower age limit

18 years

Sex

All

Total final enrolment

87

Key exclusion criteria

1. ST-elevation myocardial infarction (STEMI)
2. Target vessel is considered the culprit for an Acute Coronary Syndrome (ACS) <72 hours before consent
3. Vessels protected by a graft with a history of previous coronary artery bypass grafting
4. Age <18 years
5. Unable to provide written informed consent (IC)
6. Known pregnancy or breastfeeding at time of randomisation

Date of first enrolment

23/08/2021

Date of final enrolment

01/08/2024

Locations**Countries of recruitment**

United Kingdom

England

Study participating centre

St Thomas' Hospital

Westminster Bridge Road

London

United Kingdom

SE1 7EH

Study participating centre
Royal Brompton Hospital
Sydney Street
London
United Kingdom
SW3 6NP

Study participating centre
Glenfield Hospital NHS Trust
Grobby Road
Leicester
United Kingdom
LE3 9QP

Study participating centre
The Royal Bournemouth and Christchurch Hospitals NHS Foundation Trust
Royal Bournemouth General Hospital
Castle Lane East
Bournemouth
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BH7 7DW

Sponsor information

Organisation
Guy's and St Thomas' NHS Foundation Trust

ROR
<https://ror.org/00j161312>

Organisation
King's College London

ROR
<https://ror.org/0220mzb33>

Funder(s)

Funder type

Industry

Funder Name

Abbott Vascular

Alternative Name(s)

Funding Body Type

Private sector organisation

Funding Body Subtype

For-profit companies (industry)

Location

United States of America

Results and Publications

Individual participant data (IPD) sharing plan

Anonymised intracoronary pressure data and basic demographic data will be stored on secure King's College London servers. Participants will be identified only by a unique study ID number. All patient identifiable data and procedure records will be held by individual recruiting hospitals in line with their own Information Governance policies. No identifiable data will be transferred to the central study team. All patients will have given informed consent on the use of their data, how and where it will be stored and for how long.

IPD sharing plan summary

Stored in repository

Study outputs

Output type	Details	Date created	Date added	Peer reviewed?	Patient-facing?
Results article		14/07/2025	17/07/2025	Yes	No
HRA research summary			28/06/2023	No	No
Statistical Analysis Plan		25/07/2024	25/07/2024	No	No