# Rapid Assessment of Potential Ischaemic heart Disease with Computed Tomography Coronary Angiography (CTCA)

Submission date 03/10/2014	Recruitment status	[X] Prospecti
	No longer recruiting	[X] Protocol
<b>Registration date</b> 07/10/2014	<b>Overall study status</b> Completed	[] Statistical
		[X] Results
Last Edited	Condition category	[_] Individual
06/09/2022	Circulatory System	

- X] Prospectively registered
- ] Statistical analysis plan
- ] Individual participant data

## Plain English summary of protocol

#### Background and study aims

Recent advances in imaging technology have given us a non-invasive technique called computed tomography coronary angiography (CTCA). However, this technology has not been tested with patients presenting with suspected or confirmed acute coronary syndrome (e.g. heart attack) to the Emergency Department (ED) in the UK. CTCA is capable of giving a better treatment of such patients with suspected or confirmed acute coronary syndrome. This study aims to find out the effect of early CTCA for Emergency Department patients with suspected or confirmed ACS, compared to current standard practice. We also would like to see if this would be cost-effective to the practice.

Who can participate?

All patients aged 18 or over with suspected or confirmed ACS.

### What does the study involve?

Eligible participants will be approached in the ED, Medical Assessment Unit (MAU) or Cardiology Unit and asked if they are willing to take part. They will be randomly allocated to CTCA in addition to standard care or standard care alone. During their admission and after 1, 6 and 12 months all participants will be asked to complete questionnaires about their symptoms, quality of life, satisfaction with their care and how often they have had to use healthcare services. Participants will be in the study for one year.

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

It is possible that the results of the scan will help your doctor decide whether or not there is any narrowing or blockage of the blood vessels around your heart. It may also show additional unknown problems in the heart and chest that may not have been detected otherwise. The scan can also reveal other potential causes for your chest pain. We hope that the research will also benefit many more people by helping us decide the best way to treat patients with your condition in the future. A CT Coronary Angiogram is a routine medical procedure. The scan itself is associated with very few side effects. The most important potential side effect, as with an x-ray or CT scan, is the use of radiation. The amount of radiation used during the scan varies but is

around two to three times the amount you would normally receive in a year from background natural sources such as cosmic rays. The average excess risk of developing cancer due to a CT scan is 4 in 10,000 compared to a lifetime risk of 1 in 3. There is a very low risk of developing a reaction to the contrast agent. This usually involves an itchy rash that settles down by itself. Occasionally people require additional medications for this. If you are known to have an allergy to the contrast agent you will not be eligible to take part in the study. There is a possibility that the scan could reveal an incidental health problem that you or your doctor is unaware of. If this were to happen we would discuss this with your doctor and arrange appropriate further tests and treatments as necessary.

Where is the study run from?

This study is being co-ordinated by an experienced research team at the University of Edinburgh in collaboration with NHS Lothian. They work closely with doctors and nurses in local research teams in various hospitals throughout the UK.

When is the study starting and how long is it expected to run for? January 2015 to June 2020 (updated 15/07/2020, previously: December 2018)

Who is funding the study? National Institute for Health Research (NIHR) (UK)

Who is the main contact? Dr Alasdair Gray alasdair.gray@nhslothian.scot.nhs.uk

**Study website** https://www.emergeresearch.org/trial/rapid-ctca/

# **Contact information**

**Type(s)** Scientific

**Contact name** Prof Alasdair Gray

### **Contact details**

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# Additional identifiers

EudraCT/CTIS number

#### **IRAS number**

ClinicalTrials.gov number NCT02284191

Secondary identifying numbers HTA 13/04/108

# Study information

### Scientific Title

The role of early CT Coronary Angiography in the evaluation, intervention and outcome of patients presenting to the Emergency Department with suspected or confirmed acute coronary syndrome

#### Acronym

**RAPID-CTCA** 

#### **Study objectives**

This study aims to investigate the effect of early CTCA for ED patients with suspected or confirmed ACS, compared to current standard practice, upon interventions, event rates and health care costs in a pragmatic clinical trial and economic evaluation up to 1 year after the trial.

More details can be found at http://www.nets.nihr.ac.uk/projects/hta/1304108 Protocol can be found at http://www.nets.nihr.ac.uk/\_\_data/assets/pdf\_file/0007/136996/PRO-13-04-108.pdf

**Ethics approval required** Old ethics approval format

**Ethics approval(s)** South East Scotland Ethics Committee, 15/12/2014, ref: 14/SS/1096

**Study design** Open prospective parallel-group randomised controlled trial

**Primary study design** Interventional

Secondary study design Randomised parallel trial

**Study setting(s)** Hospital

**Study type(s)** Diagnostic

Participant information sheet

Not currently available in web format, please use the contact details below to request a patient information sheet

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

Emergency/Acute Medicine, Radiology, Cardiology

#### Interventions

Consented patients will be randomised on a 1:1 basis to CTCA in addition to standard care or standard care alone. All participants will be asked to complete questionnaires at baseline and 1, 6 and 12 months to record QoL, symptoms, patient satisfaction and health services usage.

#### Intervention Type

Other

**Phase** Not Applicable

#### Primary outcome measure

Current primary outcome measure as of 15/07/2020:

All-cause death or subsequent non-fatal type 1 or type 4b MI at one year, measured as time to first such event. MI will be defined according to the most recent Universal Definition [Thygesen K, 2012] and will be adjudicated by two independent cardiologists blinded to the intervention.

Previous primary outcome measures as of 19/01/2016:

All-cause death or recurrent non-fatal type 1 or type 4b myocardial infarction at one year and time to first such event. Myocardial infarction will be defined according to the most recent Universal Definition [Thygesen K, 2012] and will be adjudicated by two independent cardiologists blinded to the intervention.

Previous primary outcome measures:

All-cause death or recurrent non-fatal type 1 or type 4b myocardial infarction. Myocardial infarction will be defined according to the most recent Universal Definition and will be adjudicated by two independent cardiologists blinded to the intervention.

#### Secondary outcome measures

Current secondary outcome measures as of 15/07/2020: Key Secondary Endpoints

- 1. Coronary Heart Disease (CHD) death or subsequent non-fatal MI
- 2. Cardiovascular Disease (CVD) death or subsequent non-fatal MI
- 3. Subsequent Non-fatal MI
- 4. Coronary Heart Disease death
- 5. Cardiovascular death
- 6. All-cause death
- Other Endpoints
- 8. Coronary Heart Disease (CHD) death or subsequent non-fatal MI (type 1 or 4b)
- 9. Subsequent Non-fatal MI (type 1 or 4b)
- 10. Non-cardiovascular death
- 11. Invasive coronary angiography
- 12. Coronary revascularisation
- 13. Percutaneous coronary intervention
- 14. Coronary artery bypass graft

15. Proportion of patients prescribed ACS therapies during index hospitalisation

16. Proportion of patients discharged on preventative treatment or have alteration in dosage of preventative treatment during index hospitalisation

17. Length of stay for index hospitalisation

18. Representation or rehospitalisation with suspected ACS/recurrent chest pain within 12 months after index hospitalisation;

19. Chest pain symptoms up to 12 months

20. Patient satisfaction at 1 month

21. Clinician certainty of presenting diagnosis after CTCA

22. Quality of Life (measured by EQ-5D-5L up to12 months)

23. Adverse Events and Serious Adverse Events:

23.1. Proportion of patients with alternative cardiovascular diagnoses identified on CTCA

23.2. Proportion of patients with non-cardiovascular diagnosis identified on CTCA

23.3. Radiation exposure from CTCA as trial intervention

24. Cost effectiveness: estimated in terms of the lifetime incremental cost per quality-adjusted life year (QALY) gained

Previous secondary outcome measures as of 19/01/2016:

1. Hospital length of stay, coronary care length of stay

2. Proportion of patients receiving invasive coronary angiography during index hospitalisation

3. Proportion of patients receiving coronary revascularisation during index hospitalisation

4. Proportion of patients receiving subsequent unplanned coronary revascularisation after index hospitalisation within 12 months

5. Proportion of patients in CTCA arm receiving invasive coronary angiography despite <50% stenosis on CTCA

6. Proportion of patients assigned to CTCA with normal or mild non-obstructive disease

7. Proportion of patients prescribed ACS therapies and/or discharged on secondary prevention treatment or have alteration in dosage of secondary preventive treatment during index hospitalisation

8. Representation or rehospitalisation with suspected ACS/recurrent chest pain within 12 months 9. Patient symptoms and quality of life up to 12 months

10. NHS resource utilisation

11. Patient satisfaction

12. Clinician certainty of presenting diagnosis after CTCA.

Safety:

1. Proportion of patients with allergy/anaphylaxis/acute kidney injury;

2. Proportion of patients with alternative diagnoses that relates to presentation on CTCA e.g. aortic dissection or pulmonary embolus

3. Proportion of patients with incidental finding but potentially concerning on CTCA e.g. malignancy or pulmonary nodules

4. Total average radiation exposure from CTCA in the intervention arm during index hospitalisation.

Cost effectiveness:

Estimated in terms of the lifetime incremental cost per quality-adjusted life year (QALY) gained.

Previous secondary outcome measures:

- 1. Hospital length of stay, coronary care length of stay
- 2. Proportion of patients receiving invasive coronary angiography during index hospitalisation
- 3. Proportion of patients receiving coronary revascularisation during index hospitalisation

4. Proportion of patients receiving subsequent unplanned coronary revascularisation after index

hospitalisation within 12 months

5. Proportion of patients in CTCA arm receiving invasive coronary angiography despite <50% stenosis on CTCA

6. Proportion of patients assigned to CTCA with normal or non-diagnostic imaging

7. Proportion of patients prescribed ACS therapies and/or discharged on secondary prevention treatment during index hospitalisation

8. Representation or rehospitalisation with suspected ACS/recurrent chest pain within 12 months 9. Patient symptoms and quality of life up to 12 months

10. NHS resource utilisation

11. Patient satisfaction

Safety:

1. Proportion of patients with allergy/anaphylaxis/acute kidney injury

2. Proportion of patients with alternative diagnoses e.g. aortic dissection or incidental but potentially concerning e.g. malignancy or pulmonary nodules

3. Total radiation exposure in each arm

Cost effectiveness: Estimated in terms of the lifetime incremental cost per quality-adjusted life year (QALY) gained

# Overall study start date

01/01/2015

## **Completion date**

30/06/2020

# Eligibility

## Key inclusion criteria

Current inclusion criteria as of 19/01/2016:

Patients ≥18 years with symptoms mandating investigation for suspected or confirmed ACS with at least one of:

1. ECG abnormalities e.g. ST segment depression >0.5 mm

2. History of ischaemic heart disease (where the clinician assessing patient confirms history based on patient history or available records)

3. Troponin elevation above the 99th centile of the normal reference range or increase in high sensitivity troponin meeting European Society of Cardiology criteria for 'rule-in' or myocardial infarction

(NB troponin assays will vary from site to site; local laboratory reference standards will be used).

Previous inclusion criteria:

Patients aged 18 years or older with symptoms mandating investigation for suspected or confirmed ACS with at least one of:

1. ECG abnormalities e.g. ST segment depression >0.5 mm

2. History of ischaemic heart disease

3. Troponin elevation above the 99th centile of the normal reference range

(NB troponin assays will vary from site to site; local laboratory reference standards will be used).

Participant type(s)

Patient

# Age group

Adult

## Lower age limit

18 Years

### Sex

Both

# **Target number of participants** 1735

1735

# Total final enrolment

1748

# Key exclusion criteria

Current exclusion criteria as of 19/01/2016:

- 1. Signs, symptoms, or investigations supporting high-risk ACS:
- 1.1. ST elevation MI
- 1.2. ACS with signs or symptoms of acute heart failure or circulatory shock
- 1.3. Crescendo episodes of typical anginal pain

1.4. Marked or dynamic ECG changes e.g. ST depression of >3 mm

1.5. Clinical team have scheduled early invasive coronary angiography on day of trial eligibility assessment

2. Patient inability to undergo CT:

2.1. Severe renal failure (serum creatinine >250 μmol/L or estimated glomerular filtration rate <30 mL/min)

2.2. Contrast allergy

2.3. Beta blocker intolerance (if no alternative heart rate limiting agent available/suitable) or allergy

2.4. Inability to breath hold

2.5. Atrial fibrillation (where mean heart rate is anticipated to be greater than 75 beats per minute after beta blockade)

3. Patient has had invasive coronary angiography or CTCA within last 2 years and the previous investigation revealed obstructive coronary artery disease, or patient had either investigation within the last 5 years and the result was normal

- 4. Previous recruitment to the trial
- 5. Known pregnancy or currently breastfeeding

6. Inability to consent

7. Further investigation for ACS would not in the patient's interest, due to limited life

- expectancy, quality of life or functional status
- 8. Prisoners

Previous exclusion criteria:

1. Signs, symptoms, or investigations supporting high-risk ACS: ST elevation MI; ACS with signs or symptoms of acute heart failure or circulatory shock; Crescendo episodes of typical anginal pain; marked or dynamic ECG changes e.g. ST depression of >3 mm

Patient inability to undergo CT: severe renal failure (serum creatinine >250 μmol/L or estimated glomerular filtration rate <30 mL/min); contrast allergy; beta blocker intolerance; inability to hold breath; atrial fibrillation (mean heart rate greater than 75 beats per minute)</li>
 Invasive coronary angiography or CTCA within last 2 years if the previous investigation

revealed CAD, 5 years if previous investigation normal 4. Previous recruitment to the trial 5. Known pregnancy 6. Inability to consent 7. Further investigation for ACS would not in the patients interest, due to limited life expectancy, quality of life or functional status 8. Prisoners

## Date of first enrolment

11/03/2015

# Date of final enrolment

30/06/2019

# Locations

#### **Countries of recruitment** England

Jersey

Northern Ireland

Scotland

United Kingdom

Wales

**Study participating centre Royal Infirmary of Edinburgh** Edinburgh United Kingdom EH16 4SA

#### **Study participating centre Sheffield Northern General Hospital** Sheffield United Kingdom S5 7AU

**Plymouth Derriford Hospital** Plymouth United Kingdom PL6 8DH

**Study participating centre Torbay Hospital** Torquay United Kingdom TQ2 7AA

**Study participating centre Victoria Hospital** Kirkcaldy United Kingdom KY2 5AH

**Study participating centre Russells Hall Hospital** Dudley United Kingdom DY1 2HQ

**Study participating centre Royal Berkshire NHS Foundation Trust** Reading United Kingdom RG1 5AN

**Study participating centre Bradford Teaching Hospitals NHS Foundation Trust** Bradford United Kingdom BD9 6RJ

**Royal Bournemouth Hospital** Bournemouth United Kingdom BH7 7DW

**Study participating centre** Jersey General Hospital Saint Helier Jersey JE1 3QS

**Study participating centre Borders General** Melrose United Kingdom TD6 9BS

**Study participating centre Royal Victoria Infirmary** Newcastle United Kingdom NE7 7DN

**Study participating centre Lewisham University Hospital** London United Kingdom SE13 6LH

**Study participating centre Glasgow Royal Infirmary** Glasgow United Kingdom G4 0SF

#### **Milton Keynes Hospital NHS Foundation Trust** Milton Keynes United Kingdom MK6 5LD

**Study participating centre University Hospitals of the North Midlands (UHNM)** Stoke-on-Trent United Kingdom ST4 6QG

**Study participating centre Sandwell General Hospital** West Bromwich United Kingdom B71 4HJ

**Study participating centre Guy's and St Thomas' NHS Foundation Trust** London United Kingdom SE1 7EH

**Study participating centre Rotherham General Hospital** Rotherham United Kingdom S60 2UD

**Study participating centre Leeds General Infirmary** Leeds United Kingdom LS1 3EX

Queen Elizabeth Hospital

Birmingham United Kingdom B15 2TH

**Study participating centre Surrey & Sussex Hospitals (East Surrey Hospital)** Redhill United Kingdom RH1 5RH

**Study participating centre University Hospital Southampton NHS Foundation Trust** Southampton United Kingdom SO16 6YD

**Study participating centre Manchester University NHS Foundation Trust (MFT)** Manchester United Kingdom M23 9LT

**Study participating centre Luton and Dunstable University Hospital** Luton United Kingdom LU4 0DZ

**Study participating centre Barts Health NHS Trust Royal London Hospital** London United Kingdom EC1A 7BE

Whipps Cross University Hospital London United Kingdom E11 1NR

**Study participating centre Worcestershire Acute Hospitals NHS Trust** Worcester United Kingdom WR5 1DD

**Study participating centre Ulster Hospital** Belfast United Kingdom BT16 1RH

**Study participating centre University Hospital North Tees** Stockton-on-Tees United Kingdom TS19 8PE

**Study participating centre Ninewells Hospital, NHS Tayside** Dundee United Kingdom DD1 9SY

**Study participating centre Queen Alexandra Hospital** Portsmouth United Kingdom PO6 3LY

**Betsi Cadwaladr University Health Board (Wrexham Maelor Hospital)** Wrexham United Kingdom LL13 7TD

**Study participating centre Basildon and Thurrock University Hospitals NHS Foundation Trust** Basildon United Kingdom SS16 5NL

**Study participating centre The Royal Wolverhampton NHS Trust** Wolverhampton United Kingdom WV10 0QP

**Study participating centre Raigmore Hospital** Inverness United Kingdom IV2 3UJ

**Study participating centre Queen Elizabeth University Hospital** Glasgow United Kingdom G51 4TF

# Sponsor information

**Organisation** The University of Edinburgh (UK)

**Sponsor details** c/o Mrs Marise Bucukoglu ACCORD The Queen's Medical Research Institute 47 Little France Crescent Edinburgh Scotland United Kingdom EH16 4TJ +44 (0)131 242 3328 marise.bucukoglu@ed.ac.uk

**Sponsor type** University/education

ROR https://ror.org/01nrxwf90

# Funder(s)

**Funder type** Government

**Funder Name** Health Technology Assessment Programme (Ref: 13/04/108)

Alternative Name(s) NIHR Health Technology Assessment Programme, HTA

Funding Body Type Government organisation

Funding Body Subtype National government

**Location** United Kingdom

# **Results and Publications**

### Publication and dissemination plan

Our protocol states that the protocol for this trial will be submitted for publication and the trial results will be submitted for publication even if this trial stops early. If successfully completed the main paper from this project will be submitted for publication in a leading international general medical journal. The main outputs will be provided to guideline developing bodies (including NICE, SIGN and the European Society of Cardiology), key professional organisations (such as the College of Emergency Medicine) and patient representative organisations (such as the British Heart Foundation).

### Intention to publish date

### 30/06/2021

## 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?
Protocol article	protocol	07/12/2016		Yes	No
Results article	results	29/09/2021	04/10/2021	Yes	No
<u>Results article</u>	HTA report	01/08/2022	06/09/2022	Yes	No
HRA research summary			28/06/2023	No	No