

# Imaging perfusion deficits and thrombolysis safety and efficacy in acute ischaemic stroke: the Third International Stroke Trial

|                                        |                                                   |                                                                                                              |
|----------------------------------------|---------------------------------------------------|--------------------------------------------------------------------------------------------------------------|
| <b>Submission date</b><br>29/04/2004   | <b>Recruitment status</b><br>No longer recruiting | <input checked="" type="checkbox"/> Prospectively registered<br><input checked="" type="checkbox"/> Protocol |
| <b>Registration date</b><br>02/07/2004 | <b>Overall study status</b><br>Completed          | <input type="checkbox"/> Statistical analysis plan<br><input checked="" type="checkbox"/> Results            |
| <b>Last Edited</b><br>23/07/2021       | <b>Condition category</b><br>Circulatory System   | <input type="checkbox"/> Individual participant data                                                         |

## Plain English summary of protocol

### Background and study aims

About 85% of strokes are ischemic strokes. Ischemic strokes happen when the arteries that supply the brain with oxygen become narrowed or blocked, causing severely reduced blood flow (ischemia). As we age, a gradual build-up of a sticky substance called plaque can occur in our arteries. When there is a lot of plaque, particularly with a rough or irregular surface, blood clots can develop, depriving the brain of oxygen and leading to an acute ischemic stroke (AIS). Fast diagnosis and treatment are essential in the treatment of AIS. Thrombolysis, also known as “clot busting”, is a drug treatment that breaks down clots, helping to restore the blood supply to the brain. Recombinant tissue plasminogen activator (rt-PA) is a thrombolytic agent which, when approved for use in Europe, was restricted for use in patients under 80 years old within three hours of stroke onset. The aim of this study is to find out whether treatment with rt-PA is still effective within six hours of stroke onset, and whether it is still effective in older patients.

### Who can participate?

Adults who have had an ischaemic stroke within the past six hours.

### What does the study involve?

Participants are randomly allocated to one of two groups. Those in the first group receive rt-PA at a dose of 0.9 mg per kg of body weight (up to a maximum dose of 90mg) intravenously (through a drip). Those in the second group do not receive any rt-PA treatment, but are treated in the same clinical environment as participants in group one. Participants in both groups are carefully monitored for seven days and the numbers of people who die or have further strokes are recorded. Participants are also followed up for 6 months in order to record to number who are alive and independent.

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

Not provided at time of registration

### Where is the study run from?

This study is run from 156 hospitals in 12 countries across Europe, North America and Australia

When is the study starting and how long is it expected to run for?  
April 2008 to December 2012

Who is funding the study?

1. The Health Foundation (UK)
2. Medical Research Council (UK)
3. Stroke Association (UK)
4. AFA Insurances (Sweden)
5. The Norwegian Research Council (Norway)
6. The Heart Foundation (Australia)
7. The Government of Poland (Poland)

Who is the main contact?

Professor Peter A. G. Sandercock

## Contact information

### Type(s)

Scientific

### Contact name

Prof Peter A. G. Sandercock

### Contact details

Department of Clinical Neurosciences  
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## Additional identifiers

### Clinical Trials Information System (CTIS)

2004-000238-36

### Protocol serial number

EME 08/43/52; IST399

## Study information

### Scientific Title

The Third International Stroke Trial (IST-3) of thrombolysis for acute ischaemic stroke: an international multicentre, randomised, controlled trial to investigate the safety and efficacy of treatment with intravenous recombinant tissue plasminogen activator (rt-PA) within six hours of onset of acute ischaemic stroke

### Acronym

## **Study objectives**

The principal research questions to be addressed are:

1. Does thrombolysis with intravenous (iv) recombinant tissue plasminogen activator (rt-PA) up to six hours increase the number of independent survivors?
2. Does early treatment with iv rt-PA benefit a wider variety of patients than that defined by the current restricted licence (especially older people, who contribute the greatest proportion of the burden of stroke)?
3. What is the effect on deaths from all causes?

Link to EME project website: <http://www.eme.ac.uk/projectfiles/084352info.pdf>

Link to protocol: [www.eme.ac.uk/projectfiles/084352protocol.pdf](http://www.eme.ac.uk/projectfiles/084352protocol.pdf)

## **Ethics approval required**

Old ethics approval format

## **Ethics approval(s)**

Not provided at time of registration

## **Primary study design**

Interventional

## **Study design**

Randomised controlled trial

## **Study type(s)**

Treatment

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

Acute ischaemic stroke

## **Interventions**

In each collaborating hospital, the hospital co-ordinator will implement a written protocol for the immediate assessment of patients with suspected acute stroke. Patients will be 'fast-tracked' to the computerised tomography (CT) scanner in order to exclude intracranial haemorrhage as a cause of the stroke.

Consent will be sought from those patients with definite ischaemic stroke who can be treated within six hours of onset of stroke symptoms. After appropriate consent has been granted, patients will be entered in the trial by means of a telephone call to a central computer randomisation system. At the end of the call, once the patients details have been entered on the randomisation computer, the system will allocate the treatment.

Patients allocated active treatment will receive rt-PA in a dose of 0.9 mg per kg of estimated body weight up to a maximum of 90 mg. 10% will be given as an intravenous bolus over 1 - 2 minutes and the rest of the infusion will be given over the following 60 minutes.

Patients allocated control will be managed in the same clinical environment and as carefully monitored as those allocated rt-PA.

Patients will be closely monitored to detect any adverse events. Patients will have a repeat brain scan 24 hours after randomisation. Hospital events occurring within the first week will be recorded on a seven-day form.

The main follow-up will be at six months. The six month follow-up will be performed by postal administration of a questionnaire to measure functional status and health related quality of life. If a patient, who is known to be alive, does not respond to two requests to complete a postal questionnaire, disability status will be obtained by other appropriate means, usually a telephone interview but sometimes from the patients' general practitioner.

### **Intervention Type**

Drug

### **Phase**

Not Applicable

### **Drug/device/biological/vaccine name(s)**

Recombinant tissue plasminogen activator (rt-PA)

### **Primary outcome(s)**

Proportion of patients alive and independent at six months (Modified Rankin Scale score of 0, 1, or 2).

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

1. Events within seven days:

1.1. Deaths from any cause

1.2. Symptomatic intracranial haemorrhage (fatal or non-fatal)

1.3. Any intracranial haemorrhage (including asymptomatic bleeds on repeat computed tomography [CT])

1.4. Severe extracranial haemorrhage (i.e. fatal, severe enough to require transfusion or operation, or an absolute decrease in haemoglobin greater than 5 g/dl, or a decrease in haematocrit of greater than 15%, or bleeding associated with persistent or serious disability)

2. Status at six months:

2.1. Number of patients dead from any cause within six months

2.2. Number of patients making a complete recovery, and those who are alive but dependent (defined by the questions used in IST), Health Related Quality of Life (HRQoL), measured with the postal questionnaire version of the European quality of life (EuroQol)

### **Completion date**

31/03/2010

## **Eligibility**

### **Key inclusion criteria**

Patients with mild, moderate or severe strokes are potentially eligible if the following criteria are met:

1. Symptoms and signs of clinically definite acute stroke

2. Time of stroke onset is known and treatment can be started within six hours of this onset

3. Computerised tomography (CT) or magnetic resonance imaging (MRI) brain scanning has reliably excluded both intracranial haemorrhage and structural brain lesions which can mimic stroke (e.g. cerebral tumour)

**Participant type(s)**

Patient

**Healthy volunteers allowed**

No

**Age group**

Adult

**Sex**

All

**Total final enrolment**

3035

**Key exclusion criteria**

1. The patient has previously been randomised in IST-3
2. Major surgery, trauma (e.g. major fall at time of stroke) or gastrointestinal or urinary tract haemorrhage within the previous 21 days
3. Any known defect in coagulation, e.g.:
  - 3.1. Currently on oral anticoagulants with an International normalised ratio (INR) greater than 1.3, or
  - 3.2. Current treatment with heparin (unless activated partial thromboplastin time [APPT] within normal laboratory limits), or
  - 3.3. Treatment with low molecular weight heparin or heparinoid, or
  - 3.4. Treatment with Ximelagatran
4. Known defect of clotting or platelet function (but patients on antiplatelet agents can be randomised)
5. The patient is female and of childbearing potential (unless it is certain that pregnancy is not possible) or breastfeeding
6. Hypo- or hyperglycaemia sufficient to account for the neurological symptoms; the patient should be excluded if their blood glucose is less than 3.0 or greater than 20.0 mmol/L ('stick testing' is a sufficiently accurate test for this purpose)
7. Symptoms considered likely to resolve completely within the next few hours (i.e., a transient ischaemic attack [TIA])
8. Patient has had a stroke within the previous 14 days or has had a treatment for acute ischaemic stroke with thrombolytic therapy within the past 14 days
9. Patient was already dependent in activities of daily living before the present acute stroke
10. Patient has other life threatening illness (e.g. advanced cancer) likely to lead to death within a few months
11. Likely to be unavailable for follow-up, e.g., no fixed home address
12. Patient has blood pressure less than 90 mmHg or greater than 220 mmHg or diastolic blood pressure less than 40 mmHg or greater than 130 mmHg

**Date of first enrolment**

01/04/2005

**Date of final enrolment**

31/03/2010

# Locations

## Countries of recruitment

United Kingdom

Scotland

Australia

Austria

Belgium

Canada

Italy

Norway

Poland

Sweden

## Study participating centre

**University of Edinburgh**

Edinburgh

United Kingdom

EH4 2XU

# Sponsor information

## Organisation

University of Edinburgh (UK)

## ROR

<https://ror.org/01nrxf90>

# Funder(s)

## Funder type

Government

**Funder Name**

The Health Foundation (UK) (ref: 2268/1282)

**Funder Name**

Medical Research Council (MRC)/National Institutes of Health Research (NIHR) (UK) - Efficacy and Mechanism Evaluation (EME) Programme (ref: EME 08/43/52)

**Funder Name**

Stroke Association

**Alternative Name(s)**

TheStrokeAssociation, TheStrokeAssoc

**Funding Body Type**

Private sector organisation

**Funding Body Subtype**

Associations and societies (private and public)

**Location**

United Kingdom

**Funder Name**

AFA Försäkring

**Alternative Name(s)**

AFA Insurance, AFA Insurance (Sweden)

**Funding Body Type**

Private sector organisation

**Funding Body Subtype**

For-profit companies (industry)

**Location**

Sweden

**Funder Name**

Norges Forskningsråd

**Alternative Name(s)**

Forskningsrådet, Norwegian Research Council, Research Council of Norway, The Research Council of Norway

**Funding Body Type**

Government organisation

**Funding Body Subtype**

National government

**Location**

Norway

**Funder Name**

The Heart Foundation (Australia)

**Alternative Name(s)**

The Heart Foundation, Steven S. Cohen Heart Fund, The Steven S. Cohen Heart Fund, THF

**Funding Body Type**

Government organisation

**Funding Body Subtype**

Trusts, charities, foundations (both public and private)

**Location**

United States of America

**Funder Name**

The Government of Poland (Poland)

## Results and Publications

### Individual participant data (IPD) sharing plan

#### IPD sharing plan summary

#### Study outputs

| Output type                     | Details           | Date created | Date added | Peer reviewed? | Patient-facing? |
|---------------------------------|-------------------|--------------|------------|----------------|-----------------|
| <a href="#">Results article</a> | results           | 23/06/2012   |            | Yes            | No              |
| <a href="#">Results article</a> | follow-up results | 01/08/2013   |            | Yes            | No              |
| <a href="#">Results article</a> | results           | 01/04/2014   |            | Yes            | No              |

|                                               |                                  |            |                |     |
|-----------------------------------------------|----------------------------------|------------|----------------|-----|
| <a href="#">Results article</a>               | results                          | 01/07/2014 | Yes            | No  |
| <a href="#">Results article</a>               | results                          | 01/12/2014 | Yes            | No  |
| <a href="#">Results article</a>               | results                          | 01/01/2015 | Yes            | No  |
| <a href="#">Results article</a>               | results                          | 01/01/2015 | Yes            | No  |
| <a href="#">Results article</a>               | results                          | 01/03/2015 | Yes            | No  |
| <a href="#">Results article</a>               | results                          | 01/05/2015 | Yes            | No  |
| <a href="#">Results article</a>               | results                          | 01/08/2015 | Yes            | No  |
| <a href="#">Results article</a>               | results                          | 01/09/2016 | Yes            | No  |
| <a href="#">Results article</a>               | results                          | 01/12/2016 | Yes            | No  |
| <a href="#">Results article</a>               | results                          | 01/02/2017 | Yes            | No  |
| <a href="#">Results article</a>               | consent method results           | 22/07/2021 | 23/07/2021 Yes | No  |
| <a href="#">Protocol article</a>              | protocol                         | 17/06/2008 | Yes            | No  |
| <a href="#">Other publications</a>            | validation of a prognostic model | 01/04/2008 | Yes            | No  |
| <a href="#">Other publications</a>            | update                           | 30/11/2011 | Yes            | No  |
| <a href="#">Participant information sheet</a> | Participant information sheet    | 11/11/2025 | 11/11/2025 No  | Yes |
| <a href="#">Study website</a>                 | Study website                    | 11/11/2025 | 11/11/2025 No  | Yes |