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European Carotid Surgery Trial 2

Submission date
05/07/2012

Recruitment status
No longer recruiting

Registration date
05/07/2012

Overall study status
Completed

Last Edited
27/07/2026

Condition category
Circulatory System

[_] Prospectively registered
[X] Protocol
[_] Statistical analysis plan
[_] Results
[_] Individual participant data
[X] Record updated in last year

Plain English summary of protocol

Background and study aims
Atherosclerotic carotid stenosis is a narrowing of the carotid artery in the neck by fatty deposits. It is an important cause of stroke, and hence disability and premature death. Previous studies have shown that an operation to remove the narrowing, known as carotid endarterectomy (CEA), is more effective than treatment with tablets to prevent stroke. In some patients a treatment called stenting may be as effective as surgery. Stenting involves a wire mesh tube being inserted via an artery in the groin and opened up across the narrowing in the neck. However, drug treatment has improved since the original studies of surgery. We think medical treatment is now so effective that the benefits of removing the narrowing may not justify the risk of surgery or stenting in patients with a lower risk of stroke, such as those who have had no symptoms for some months or never had symptoms from the narrowing. The aim of this study is to determine whether these patients should be managed by drug treatment alone or should still be referred for surgery or stenting.

Who can participate?
Patients over 18 years of age with atherosclerotic carotid stenosis and at a lower risk of stroke.

What does the study involve?
Participants have their medication adjusted to reach the recommended levels for cholesterol and blood pressure, and receive advice about healthy lifestyle. Half of the patients are randomly allocated to have surgery or stenting as soon as possible, and the other half continue on medical treatment alone until such time, if ever, that revascularisation surgery becomes clearly indicated. Participants are seen regularly for several years to check their cholesterol and blood pressure remain on target and to record any surgical complications and the occurrence of strokes or heart attacks.

What are the possible benefits and risks of participating?
The results will be used to help patients and doctors to choose which treatment plan is the safest and most effective. Both surgical endarterectomy and stenting carry a risk of causing a stroke at the time of the treatment. Previous studies showed a risk of stroke or death at the time of surgery or stenting of between 3 and 6 patients in every 100 patients. Treatment is not always successful and the carotid stenosis may recur and require further treatment or the artery may become blocked. A proportion of people treated with optimized medical treatment will also suffer stroke at some time during follow-up despite treatment. Stroke caused by surgery,

stenting or occurring during OMT may recover, cause permanent disablement or be fatal. Surgery also has a risk of causing a heart attack. About one in ten patients has cranial nerve palsy (temporary tongue or facial weakness). A haematoma (a solid swelling of clotted blood) may form at the site of incision, which may require removal. Angiography and stenting may also result in bruising or haematoma at the site of injection (usually in the groin) and can cause temporary discomfort or pain in the neck. There is a small risk of allergic reactions to the dye. The drugs used as part of OMT may cause adverse reactions or allergic reactions. The medical treatment that patients in both arms will receive will be carefully monitored and optimised with targets for control of blood pressure and lipid levels and advice on lifestyle. In the revascularisation group the surgeons and interventionists providing this treatment will have to show acceptable complication levels laid down in the protocol before their centre can be enrolled to randomise patients into the study. We have designed the protocol in such a way as to minimise risks to patients in both arms of the study and all patients should benefit from the optimisation and monitoring of their medical treatment.

Where is the study run from?
University College London, UK, University Hospital, Basel, Switzerland, and Amsterdam Medical Centre, The Netherlands.

When is the study starting and how long is it expected to run for?
March 2012 to March 2025

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

Who is the main contact?
Ekaterina Biggs
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Contact information

Type(s)
Scientific

Contact name
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Additional identifiers

Protocol serial number
11034

Study information

Scientific Title
European Carotid Surgery Trial 2 (ECST-2): a randomised controlled trial

Acronym
ECST 2

Study objectives
Narrowing of the carotid artery in the neck by fatty deposits is an important cause of stroke, and hence disability and premature death. Previous trials have shown that an operation to remove the narrowing, known as carotid endarterectomy (CEA), is more effective than treatment with tablets to prevent stroke. In some patients a treatment called stenting where a wire mesh tube is inserted via an artery in the groin and opened up across the narrowing in the neck may be as effective as surgery. However, drug therapy has improved since the original trials of surgery. The trialists think medical therapy is now so effective that the benefits of removing the narrowing may not justify the risk of surgery or stenting in patients with a lower risk of stroke e.g. those who have had no symptoms for some months from the narrowing or never had symptoms. They propose a clinical trial to determine whether these patients should be managed by drug therapy alone or should still be referred for surgery or stenting.

Ethics approval required
Old ethics approval format

Ethics approval(s)
National Research Ethics Service Committee – East of England, Cambridge Central, 19/10/2011, ref: 11/EE/0347

Primary study design
Interventional

Study design
Randomised controlled interventional trial

Study type(s)
Treatment

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

Interventions
Immediate endartorectomy and optimised medical therapy.

All patients will have their medication adjusted to reach recommended levels for cholesterol and blood pressure, and receive advice about healthy lifestyle. Half the patients will be randomly

allocated to have surgery or stenting as soon as possible, the other half will continue on medical treatment alone until such time, if ever, that revascularisation becomes clearly indicated. Patients will be seen regularly for several years to check their cholesterol and blood pressure remain on target and to record surgical complications and the occurrence of strokes or heart attacks. An interim safety analysis will be performed using MRI follow up to assess rates of new cerebral infarction and haemorrhage.

Intervention Type
Mixed

Primary outcome(s)
Any stroke at any time + non-stroke death within 30 days of endartorectomy

Key secondary outcome(s)
Added 06/05/2016:
The long-term rates of the following outcomes:
1. Ipsilateral stroke, confirmed/probable TIA, MI or any hospitalisation for vascular disease during follow up
2. Disabling stroke during follow up
3. New cerebral infarction or parenchymal haemorrhage on follow up MRI
4. Increase in white-matter changes on follow up MRI
5. Revascularisation during follow-up
6. Stenosis progression (defined as recurrent stenosis of the randomised artery after revascularisation, or progression in severity of stenosis in a non-revascularised artery)
7. The combination of stenosis progression or revascularisation during follow-up
8. Functional status as assessed by comparison of modified Rankin scale scores
9. The cost-effectiveness of carotid endarterectomy with OMT compared to OMT alone
10. Cognitive impairment or dementia during follow up reported by the investigator and measured by the Montreal Cognitive Assessment (MoCA)
11. Decline in functional status as assessed by an increase in the modified Rankin score (mRS)
12. Health-related quality of life and economic costs
Secondary analysis will also examine the risk factors for stroke, cognitive impairment and the other main outcome events during long term follow up (including the risks related to age, sex, symptoms, baseline brain imaging, centre and technique). In centres performing the relevant additional investigations, secondary analyses will examine the relationship between the main outcome events and baseline measures of plaque instability as determined by MR plaque imaging.

Completion date
31/03/2025

Eligibility

Key inclusion criteria
1. Patients over 18 years of age with atherosclerotic carotid stenosis equivalent to at least 50% measured using the North American Symptomatic Carotid Endarterectomy Trial (NASCET) method
2. Patient is medically and neurologically stable and suitable for CEA or carotid artery stenting (CAS)
3. Patients with a carotid artery risk (CAR) score indicating a 5-year ipsilateral stroke risk of <20%. This may include patients with asymptomatic stenosis or symptomatic stenosis associated

with features (e.g. delayed presentation) indicating intermediate or lower risk, confirmed by CAR Score <20%
4. Clinicians are uncertain about which treatment modality is best for the individual patient
5. Patient or appropriate representative is able and willing to give informed consent
6. Male and female participants

Participant type(s)
Patient

Healthy volunteers allowed
No

Age group
Mixed

Lower age limit
18 Years

Upper age limit
100 Years

Sex
All

Total final enrolment
429

Key exclusion criteria
1. Patients (or their representatives) unwilling to have either treatment modality
2. Patients unwilling or unable to participate in follow up for whatever reason
3. Patients with a Rankin score greater than 3 for any reason. Such patients may be eligible for inclusion at such time as they improve to a Rankin score of 3 or less
4. Patients who are medically or neurologically unstable or have progressing neurological signs. Such patients may be eligible for inclusion at such time as they become stable
5. Patients in whom it is planned to carry out coronary artery bypass grafting or other major surgery within one month of carotid stenting or endarterectomy
6. Patients with a CAR Score >20% or other reason for believing the patient would get clear benefit from CEA or CAS
7. Patients not suitable for either surgery or stenting due to anatomical factors
8. Carotid stenosis caused by nonatherosclerotic disease e.g. dissection, fibromuscular disease or neck radiotherapy
9. Previous CEA or stenting in the randomised artery
10. Patients who are known to be pregnant
11. Patients who have a life expectancy of less than two years due to a preexisting condition e.g. cancer
12. Patients intolerant or allergic to all of the medications available for optimised modern medical therapy
13. Patients in clinical trials of medicinal products (CTIMPS) or who have been in a CTIMP within the last 4 months will not be enrolled

14. Patients in other trials (both stroke related and non stroke related) may be enrolled where this would not conflict with the treatments used in ECST2 or place undue additional burdens on the patient

Date of first enrolment
23/03/2012

Date of final enrolment
31/10/2019

Locations

Countries of recruitment
United Kingdom

England

Scotland

Canada

France

Germany

Italy

Netherlands

Switzerland

Study participating centre
National Hospital for Neurology and Neurosurgery
-
London
England
WC1N 3BG

Study participating centre
University College London Hospital
250 Euston Road
London
England
NW1 2PG

Study participating centre
Sheffield Teaching Hospitals NHS Foundation Trust
Northern General Hospital
Herries Road
Sheffield
England
S5 7AU

Study participating centre
Nottingham University Hospitals NHS Trust - City Campus
Nottingham City Hospital
Hucknall Road
Nottingham
England
NG5 1PB

Study participating centre
Leeds General Infirmary
Great George Street
Leeds
England
LS1 3EX

Study participating centre
Calderdale and Huddersfield NHS Foundation Trust
Trust Headquarters
Acre Street
Lindley
Huddersfield
England
HD3 3EA

Study participating centre
Frimley Park Hospital
Frimley Park Scanning Centre
Portsmouth Road
Frimley
Camberley
England
GU16 7UJ

Study participating centre
East Kent Hospitals University NHS Foundation Trust
Kent & Canterbury Hospital
Ethelbert Road
Canterbury
England
CT1 3NG

Study participating centre
Royal Devon and Exeter Hospital
Gladstone Road
Exeter
England
EX1 2ED

Study participating centre
St George's Hospital
Blackshaw Road
Tooting
London
England
SW17 0QT

Study participating centre
Manchester Royal Infirmary
Oxford Road
Manchester
England
M13 9WL

Study participating centre
NHS Ayrshire and Arran
PO Box 13, Boswell House
10 Arthur Street
Ayr
Scotland
KA7 1QJ

Study participating centre
Bradford Teaching Hospitals NHS Foundation Trust
Bradford Royal Infirmary

Duckworth Lane
Bradford
England
BD9 6RJ

Study participating centre
University Hospital of North Durham
North Road
Durham
England
DH1 5TW

Study participating centre
Wythenshawe Hospital
Southmoor Road
Wythenshawe
Manchester
England
M23 9LT

Study participating centre
Ashford and St Peter's Hospitals NHS Foundation Trust
St Peters Hospital
Guildford Road
Chertsey
England
KT16 0PZ

Study participating centre
Pennine Acute Hospitals NHS Trust
-
Crumpsall
England
M8 5RB

Study participating centre
Universitätsklinikum Magdeburg
Otto-von-Guericke-Universität
Germany
-

Study participating centre
Academic Medical Centre, Amsterdam and Flevoziekenhuis, Almere
Netherlands
-

Study participating centre
Albert Schweitzer Hospital Dordrecht
Netherlands
-

Study participating centre
Stroke Centre, University Hospital Basel
Switzerland
-

Study participating centre
Erasmus Medical Centre Rotterdam
Netherlands
-

Study participating centre
Dalhousie University
Halifax
Canada
-

Study participating centre
Hospices Civiles de Lyon
Lyon
France
-

Study participating centre
University of Leipzig
Leipzig
Germany
-

Study participating centre
Verona University Hospital
Verona
Italy
-

Study participating centre
Kantonsspital St. Gallen
St. Gallen
Switzerland
-

Study participating centre
NSI-Lugano
Lugano
Switzerland
-

Study participating centre
Maastricht University Medical Centre
Maastricht
Netherlands
-

Study participating centre
Radbound University Nijmegen Medical Centre
Nijmegen
Netherlands
-

Study participating centre
University Medical Center Utrecht
Utrecht
Netherlands
-

Sponsor information

Organisation
University College London (UK)

ROR
https://ror.org/02jx3x895

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

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
Schweizerischer Nationalfonds zur Förderung der Wissenschaftlichen Forschung

Alternative Name(s)
Schweizerischer Nationalfonds, Swiss National Science Foundation, Fonds National Suisse de la Recherche Scientifique, Fondo Nazionale Svizzero per la Ricerca Scientifica, Fonds National Suisse, Fondo Nazionale Svizzero, Schweizerische Nationalfonds, The Swiss National Science Foundation (SNSF), SNF, SNSF, FNS

Funding Body Type
Private sector organisation

Funding Body Subtype
Trusts, charities, foundations (both public and private)

Location
Switzerland

Results and Publications

Individual participant data (IPD) sharing plan
The datasets generated during and/or analysed during the current study will be available upon request from the chief investigator Prof. Martin Brown.

IPD sharing plan summary
Available on request

Study outputs

Output type	Details	Date created	Date added	Peer reviewed?	Patient-facing?
Protocol article		27/07/2022	28/07/2022	Yes	No
Interim results article	2-year interim results	20/04/2025	23/04/2025	Yes	No
Other publications		02/10/2024	27/07/2026	Yes	No
Study website		11/11/2025	11/11/2025	No	Yes