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# Acute stroke treatment in the ambulance with a nitroglycerin patch

**Submission date**
31/10/2017

**Recruitment status**
No longer recruiting

**Registration date**
02/01/2018

**Overall study status**
Completed

**Last Edited**
13/02/2024

**Condition category**
Nervous System Diseases

[X] Prospectively registered
[X] Protocol
[_] Statistical analysis plan
[X] Results
[_] Individual participant data

## Plain English summary of protocol

Background and study aims
Stroke is a life-threatening medical condition, caused by a disorder in the blood supply to the brain. There are two main types of stroke: ischaemic, caused by a reduction in blood flow, or haemorrhagic, caused by a rupture of an artery in the brain. Within minutes, brain cells die. Symptoms can vary from limb weakness, drooping of the face or speech difficulties. Prompt treatment is crucial and early action can reduce brain damage and complications. This study investigates the treatment of stroke with an adhesive patch containing the medicine nitroglycerin. Nitroglycerin is a medication that is commonly administered as heart medication but it could help if applied quickly after a stroke as it can help lower blood pressure and open up blood vessels. This patch will be given in the ambulance by the paramedic to patients with suspected stroke (brain infarct or bleeding). Recent research suggests a beneficial effect of the treatment with this drug in patients with acute stroke, if given within the first few hours. The aim of this study is to find out if treatment with a nitroglycerin patch will lead to better functional outcome at 90 days.

Who can participate?
Adult patients with suspected stroke with symptom onset within 3 hours and a systolic blood pressure of 140 and higher can participate.

What does the study involve?
Participants are randomly allocated to one of two groups. Those in the first group receive the standard care. Those in the second group receive a transdermal nitroglycerin patch with a dosage of 5 mg/24 hours to wear plus standard care. The patch is applied by a paramedic in the pre-hospital setting and continued during hospital admission for a total of 24 hours. During hospital admission, no extra tests or investigations will be performed. At 90 days, participants receive a phone call to assess the outcomes of the patch.

What are the possible benefits and risks of participating?
The possible benefit of this treatment is a better functional outcome. This will be measured during a telephone follow-up after 3 months. The possible risks of participating are the side

effects of the medication. Nitroglycerin has been used for decades in heart disease and is most often well tolerated. The most common side effects are headache, nausea and low blood pressure.

Where is the study run from?
This study is run from the University Medical Center Utrecht (Netherlands) and the Academic Medical Center in Amsterdam (Netherlands).

When is the study starting and how long is it expected to run for?
May 2017 to June 2021

Who is funding the study?
Dutch Heart Foundation (Netherlands)

Who is the main contact?
Miss Sophie van den Berg

# Contact information

### Type(s)
Scientific

### Contact name
Miss Sophie van den Berg

### Contact details
Academisch Medisch Centrum
Meiberglaan 9
Amsterdam
Netherlands
1105AZ

# Additional identifiers

### Clinical Trials Information System (CTIS)
2016-005086-31

### Protocol serial number
60258

# Study information

### Scientific Title
Multicentre Randomised trial of Acute Stroke treatment in the Ambulance with a nitroglycerin Patch

### Acronym
MR ASAP

### Study objectives

Prehospital treatment with a transdermal nitroglycerin patch, applied within 3 hours after stroke onset, improves functional outcome at 90 days in patients with acute ischaemic stroke or intracerebral haemorrhage.

## Ethics approval required
Old ethics approval format

## Ethics approval(s)
Institutional review board of the Erasmus Medical Center, 19/10/2017, ref: MEC-2017-369

## Study design
Multicentre prospective randomized open-label clinical trial with blinded endpoint assessment (PROBE design)

## Primary study design
Interventional

## Study type(s)
Treatment

## Health condition(s) or problem(s) studied
Acute ischaemic stroke and intracerebral haemorrhage

## Interventions
Participants are randomly assigned in a 1:1 ratio by a web-based randomisation to one of two groups. Those in the first group receive the standard care. Those in the second group receive a transdermal nitroglycerin patch with a dosage of 5 mg/24 hours to wear plus standard care. The patch is applied by a paramedic in the prehospital setting and continued during hospital admission for a total of 24 hours. During hospital admission, no extra tests or investigations will be performed. At 90 days, a telephone interview is performed by a blinded outcome assessor to assess the outcomes of the patch.

## Intervention Type
Drug

## Phase
Phase III

## Drug/device/biological/vaccine name(s)
Glyceryl trinitrate

## Primary outcome(s)
Functional outcome is assessed using the modified Rankin Scale (mRS) at 90 days.

## Key secondary outcome(s))
1. At hospital admission:
1.1. Vital signs (blood pressure and heart rate)
1.2. Collateral circulation assessed with CT-angiography
2. At 24 hours:
2.1. Treatment with intravenous thrombolysis and/or endovascular treatment
2.2. Vital signs (blood pressure and heart rate)

2.3. Neurological deficit assessed using the National Institutes of Health Stroke Scale (NIHSS)
3. At 90 days, assessed during a blinded telephone interview:
3.1. Death
3.2. Dichotomised mRS (0-1 vs. 2-6; 0-2 vs. 3-6; 0-3 vs. 4-6)
3.3. Disability assessed with the score on the Barthel Index
3.4. Quality of life assessed with the EuroQol-5D-5L
3.5. Home time and patient location over the first 90 days

### Completion date
24/06/2021

## Eligibility

### Key inclusion criteria
1. Age 18 years or older
2. Probable diagnosis of acute stroke, as assessed by the paramedic in the prehospital setting
3. Score of 2 or 3 on the Face Arm Speech Test (FAST)
4. Systolic blood pressure ≥ 140 mm Hg
5. Possibility to start the trial treatment within 3 hours of symptom onset
6. Intention to transport the patient to one of the participating hospitals
7. Written informed consent (deferred)

### Participant type(s)
Patient

### Healthy volunteers allowed
No

### Age group
Adult

### Lower age limit
18 years

### Sex
All

### Total final enrolment
325

### Key exclusion criteria
1. Considerable pre-stroke dependency in activities of daily living, defined as staying in a chronic nursing home or rehabilitation centre
2. Known pregnancy or lactation
3. Indication for acute treatment with nitroglycerin or known use of nitroglycerin in the previous 12 hours
4. Indication for acute reduction of blood pressure
5. Known hypersensitivity to GTN, nitrates in general, or the adhesives used in the patch
6. Glasgow Coma Scale < 8
7. Known with any of the following heart disorders: myocardial insufficiency due to obstruction;

aortic or mitral valve stenosis; constrictive pericarditis; hypertrophic obstructive cardiomyopathy; cardiac tamponade
8. Known marked anaemia, defined as haemoglobin < 5 mmol/L
9. Known closed angle glaucoma
10. Known concomitant use of phosphodiesterase type-5 inhibitors, (e.g. sildenafil, tadalafil, vardenafil)

### Date of first enrolment
04/04/2018

### Date of final enrolment
31/10/2021

## Locations

### Countries of recruitment
Netherlands

### Study participating centre
**Academic Medical Center**
Amsterdam
Netherlands
1105AZ

### Study participating centre
**University Medical Center (lead centre)**
Utrecht
Netherlands
-

### Study participating centre
**Isala, Zwolle**
Netherlands
-

### Study participating centre
**VU University Medical Center**
Amsterdam
Netherlands
-

**Study participating centre**
**OLVG-West**
Amsterdam
Netherlands
-

**Study participating centre**
**MC Slotervaart**
Amsterdam
Netherlands
-

**Study participating centre**
**Waterland Hospital**
Purmerend
Netherlands
-

**Study participating centre**
**St. Antonius Hospital**
Nieuwegein
Netherlands
-

**Study participating centre**
**Meander Medical Center**
Amersfoort
Netherlands
-

**Study participating centre**
**Diakonessenhuis**
Utrecht
Netherlands
-

# Sponsor information

**Organisation**
University Medical Center Utrecht

**ROR**
https://ror.org/0575yy874

# Funder(s)

**Funder type**
Charity

**Funder Name**
Dutch Heart Foundation

# 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? |
|---|---|---|---|---|---|
| Results article | | 01/09/2022 | 05/09/2022 | Yes | No |
| Protocol article | protocol | 26/06/2019 | 28/06/2019 | Yes | No |
| Abstract results | | 22/05/2019 | 13/02/2024 | No | No |
| Abstract results | | 01/09/2021 | 13/02/2024 | No | No |
| Abstract results | | 03/05/2022 | 13/02/2024 | No | No |
| Participant information sheet | Participant information sheet | 11/11/2025 | 11/11/2025 | No | Yes |
| Study website | Study website | 11/11/2025 | 11/11/2025 | No | Yes |