# Dynamics of language-related neuroplasticity in stroke: a longitudinal study

Published: 18-05-2020
Last updated: 08-04-2024

The present study examines stroke patients* language abilities as well as the recruitment of additional brain areas in language use over time to compensate for stroke-induced language deficits.

| | |
|---|---|
| **Ethical review** | Approved WMO |
| **Status** | Recruiting |
| **Health condition type** | Other condition |
| **Study type** | Observational non invasive |

## Summary

### ID

NL-OMON49365

**Source**
ToetsingOnline

**Brief title**
LangPlast

### Condition

- Other condition
- Structural brain disorders

**Synonym**
CVA, stroke

**Health condition**

aphasia and language disorders through brain damage

**Research involving**
Human

## Sponsors and support

**Primary sponsor:** Radboud Universiteit Nijmegen
**Source(s) of monetary or material Support:** Ministerie van OC&W

## Intervention

**Keyword:** aphasia, Plasticity, stroke

## Outcome measures

### Primary outcome

Main study parameter is the task-related brain activity measured with electroencephalography and how it differs over time, together with patients* functional communication and memory performance for the included behavioural tasks.

### Secondary outcome

To assess the effort that patients often experience in language use after stroke lesions, measured by tracking the heart rate and skin conduction due to sweat responses (GSR).

# Study description

### Background summary

Suffering from a stroke in the left hemisphere very often impairs patients* language functions. Recent research suggests that, during recovery, additional brain areas might be recruited to overcome deficits induced by the lesion. However, the underlying processes of this neural recruitment and reorganization of language functions in the brain are still largely unknown. The present study will investigate the language-related recruitment and reorganization in the brain at different time points after stroke. We will employ electroencephalography combined with various language and memory tasks to gain more insight into brain areas that are recruited for language functioning after stroke lesions, and its effect on behavioural language performance.

### Study objective

The present study examines stroke patients* language abilities as well as the recruitment of additional brain areas in language use over time to compensate for stroke-induced language deficits.

### Study design

Longitudinal study at two time points to assess patients* memory and communication abilities and language-related brain activity at approximately two and seven months after stroke onset.

### Study burden and risks

The current procedures of electroencephalography and magnetic resonance imaging and experimental measures implicate minimal burden and insignificant risk to participants. Patients do not directly benefit from their participation in terms of therapeutic gain, but they do obtain extensive information about their language and communicative abilities and change over time, which they appreciate. Participants can withdraw from the study at any time point. The findings of this study will yield further insights into the reorganization of the language network after stroke and possibly aid to create more individualized patient therapy and care.

## Contacts

**Public**
Radboud Universiteit Nijmegen

Montessorilaan 3
Nijmegen 6525 HR
NL
**Scientific**
Radboud Universiteit Nijmegen

Montessorilaan 3
Nijmegen 6525 HR
NL

## Trial sites

### Listed location countries

Netherlands

## Eligibility criteria

**Age**
Adults (18-64 years)
Elderly (65 years and older)

### Inclusion criteria

• Between 18 - 78 years of age
• Ischemic or haemorrhagic cerebral infarction
• Postonset of approx. 2 months (subacute stage) for session 1, and 7 months (chronic stage) for session 2
• Native speaker of Dutch
• Pre-morbidly right handed
• Willingness and ability to give written informed consent and willingness and ability to understand the nature and content, to participate and to comply with the study requirements.

### Exclusion criteria

• History of previous stroke
• Pre-existent cognitive problems
• Severe aphasia (unable to understand instructions or provide consent). This will be predetermined by the referring neurologist or speech language pathologist, according to their usual practice
• Use of psychotropic medication or recreational drugs
• Pregnancy
• Serious head trauma
• Neurological or psychiatric disorders (other than stroke or epilepsy as a consequence of the stroke)
• Large or ferromagnetic metal parts in the head (except for a dental wire)
• Implanted cardiac pacemaker or neurostimulator
• Claustrophobia

## Study design

### Design

| | |
|---|---|
| Study type: | Observational non invasive |
| Intervention model: | Other |
| Allocation: | Non-randomized controlled trial |
| Masking: | Open (masking not used) |
| Control: | Active |
| Primary purpose: | Other |

### Recruitment

NL

| | |
|---|---|
| Recruitment status: | Recruiting |
| Start date (anticipated): | 08-02-2021 |
| Enrollment: | 75 |
| Type: | Actual |

## Ethics review

Approved WMO

| | |
|---|---|
| Date: | 18-05-2020 |
| Application type: | First submission |
| Review commission: | CMO regio Arnhem-Nijmegen (Nijmegen) |

## Study registrations

### Followed up by the following (possibly more current) registration

No registrations found.

### Other (possibly less up-to-date) registrations in this register

No registrations found.

## In other registers

| Register | ID |
| --- | --- |
| CCMO | NL72600.091.20 |