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Using magnetic brain stimulation to help thinking and memory after brain tumour treatment

Submission date
02/01/2026

Recruitment status
Recruiting

Registration date
19/01/2026

Overall study status
Ongoing

Last Edited
18/02/2026

Condition category
Mental and Behavioural Disorders

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

Plain English summary of protocol

Background and study aims
Many people who are treated for a low-grade glioma (a slow-growing type of brain tumour) experience long-term difficulties with memory, concentration, attention, and thinking skills. These problems can affect everyday life, including work, relationships, and independence, and there are currently very limited treatments available to improve them. The aim of this study is to better understand the type and severity of cognitive (thinking) difficulties experienced by people with low-grade glioma and to find out whether a non-invasive brain stimulation treatment called repetitive transcranial magnetic stimulation (rTMS) can help improve cognitive function.

Who can participate?
Adults aged 18 years or over who were treated surgically for a low-grade glioma at The Walton Centre NHS Foundation Trust from 2013 onwards may be invited to take part. Participation is entirely voluntary, and people can choose which parts of the study they wish to take part in.

What does the study involve?
The study has three parts. In the first part, participants will be asked to complete online questionnaires and computer-based thinking tests at home, which take less than 90 minutes in total and can be completed with breaks. In the second part, researchers will use results from these tests together with existing MRI brain scans to understand how tumour location relates to thinking difficulties. In the third part, a smaller number of participants with cognitive difficulties may be invited to take part in a proof-of-concept study involving several sessions of rTMS over 4 weeks, along with thinking tests and MRI scans over a three-month period.

What are the possible benefits and risks of participating?
Taking part may help participants better understand their own cognitive strengths and difficulties. Some participants who receive rTMS may experience improvements in thinking skills, although this cannot be guaranteed. The risks of taking part are overall low. Online assessments

may cause temporary tiredness or frustration. rTMS can cause short-lived side effects such as headache, scalp discomfort, or mild fatigue. Serious side effects, such as seizures, are very rare and safety procedures are in place.

Where is the study run from?
The study is run by the University of Liverpool in collaboration with The Walton Centre NHS Foundation Trust in Liverpool. Some parts of the study are completed entirely online at home, while in-person visits take place at the Walton Centre or nearby research facilities.

When is the study starting and how long will it run for?
The study is planned to start in February 2026 and is expected to run until August 2030.

Who is funding the study?
The study is funded by the National Institute for Health and Care Research (NIHR). Additional support, such as some equipment, is provided by industry partners.

Who is the main contact?
Mr Ahmad Ali, wcft.carelgg-study@nhs.net

Contact information

Type(s)
Public, Scientific, Principal investigator

Contact name
Mr Ahmad Ali

Contact details
The Walton Centre NHS Foundation Trust
Lower Lane
Liverpool
United Kingdom
L97LJ
+44 (0)151 525 3611
wcft.carelgg-study@nhs.net

Additional identifiers

Integrated Research Application System (IRAS)
345620

Central Portfolio Management System (CPMS)
63415

Study information

Scientific Title
Cognitive brain rehabilitation using transcranial magnetic stimulation in patients with low grade glioma: a proof-of-concept study

Acronym
CARE-LGG

Study objectives
1. Evaluate the long-term cognitive deficits in patients with LGG
2. Identify clinical predictors of cognitive deficits in LGG
3. Establish the utility of remote cognitive testing in patients with brain tumours
4. Generate a spatial map of cognitive deficits in LGG
5. Determine whether rTMS induces any cognitive changes in patients with LGG
6. Determine if any network level changes occur with any cognitive changes induced by rTMS

Ethics approval required
Ethics approval required

Ethics approval(s)
notYetSubmitted

Primary study design
Interventional

Allocation
Randomized controlled trial

Masking
Open (masking not used)

Control
Historical

Assignment
Parallel

Purpose
Device feasibility, Treatment

Study type(s)

Health condition(s) or problem(s) studied
Cognitive deficits in patients previously treated for low grade glioma

Interventions
Only WP3 will be interventional for this study. This will involve 12 sessions of repetitive Transcranial Magnetic Stimulation (rTMS) over 4 weeks. Intermittent Theta Burst dual-target rTMS will be delivered to frontal and parietal targets in the hemisphere contralateral to the treated tumour.

The control arm will receive no rTMS. They will only perform the cognitive and MRI assessments to allow comparison.

Patients will be allocated to either arm using pairwise randomisation.

Intervention Type
Device

Phase
Phase II

Drug/device/biological/vaccine name(s)
Transcranial Magnetic Stimulation

Primary outcome(s)
1. Subjective cognition measured using Functional Assessment of Cancer Therapy-Cognitive Function (FACT-Cog) at 0, 1, and 3 months

Key secondary outcome(s))
1. Objective cognition measured using the Cambridge Neuropsychological Test Automated Battery (CANTAB) battery of electronic cognitive tests at 0, 1, and 3 months

2. Objective cognition measured using Hopkins Verbal Learning Test-Revised (HVLT-R), Trail Making Test (TMT), Controlled Oral Word Association (COWA) paper-based tests at 0, 1, and 3 months

Completion date
31/08/2030

Eligibility

Key inclusion criteria
WP - Work Package

For WP1:
1. Treated for low-grade glioma (grade 2 intrinsic glial tumour) from 2013 onwards at the Walton Centre NHS Foundation Trust
2. Adult patients (>18 years) at time of treatment

For WP2:
1. Completed online assessments in WP1
2. Available post-operative volume MRI (T1 or FLAIR)

For WP3:
1. Cognitive eligibility: Presence of objective or subjective cognitive deficits defined as >1 SD below the average on any CANTAB test or scoring <55/72 in the Perceived Cognitive Impairments subscale of FACT-Cog
2. Medical stability: no documented change to medical management (chemotherapy, radiotherapy, or surgery) within the last 3 months
3. The invited patients will be selected based on pairwise randomisation from patients who completed assessments in WP1. Pairwise randomisation will be used to balance the two groups on key predictor variables

Healthy volunteers allowed
No

Age group
Mixed

Lower age limit
18 years

Upper age limit
100 years

Sex
All

Total final enrolment
0

Key exclusion criteria
For WP1:
1. No explicit exclusion criteria

For WP2:
1. No explicit exclusion criteria

For WP3:
1. Contraindications to strong magnetic fields (applicable to the TMS sessions and the MRI follow-up scans)
2. Active known pregnancy
3. Unable or unwilling to travel to the Sid Watkins building for TMS sessions
4. History of uncontrolled seizures

Date of first enrolment
01/02/2026

Date of final enrolment
01/12/2027

Locations

Countries of recruitment
United Kingdom

England

Study participating centre
The Walton Centre NHS Foundation Trust
Lower Lane
Fazakerley
Liverpool
England
L9 7LJ

Sponsor information

Organisation
University of Liverpool

ROR
https://ror.org/04xs57h96

Funder(s)

Funder type

Funder Name
National Institute for Health and Care 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
Nexstim

Results and Publications

Individual participant data (IPD) sharing plan

IPD sharing plan summary
Not expected to be made available