

# Advanced hyperspectral imaging during brain tumour surgery

<b>Submission date</b> 04/04/2022	<b>Recruitment status</b> No longer recruiting	<input type="checkbox"/> Prospectively registered <input type="checkbox"/> Protocol
<b>Registration date</b> 01/06/2022	<b>Overall study status</b> Completed	<input type="checkbox"/> Statistical analysis plan <input type="checkbox"/> Results
<b>Last Edited</b> 17/06/2025	<b>Condition category</b> Surgery	<input type="checkbox"/> Individual participant data <input checked="" type="checkbox"/> Record updated in last year

## Plain English summary of protocol

### Background and study aims

Brain surgery operations include brain tumour resection and procedures relating to blood vessel abnormalities. Each year in the UK, about 70,500 patients are diagnosed with a brain tumour, 5,000 of whom undergo surgery. About 1,000 patients undergo blood vessel surgery. There is an acute need to improve outcomes for affected brain tumour patients. Patients undergoing surgery have significantly improved outcomes and increased life expectancy if complete tumour removal is achieved. However, close to 30% of patients are left with residual tumour tissue after surgery. Successful surgery indeed mandates maximal safe tumour removal: surgeons need to avoid damaging sensitive areas that undertake vital functions and preserve crucial nerves and blood vessels. Even with the most advanced current techniques, it is not possible to always reliably identify the tumour and critical structures during surgery. Furthermore, because one cannot objectively measure the blood supply and oxygenation of brain tissue during surgery, it is difficult to judge if the injury is being caused during the operation. The aim of this study is to obtain images during brain surgery using a new type of surgical non-contact camera system. The study will obtain video images at the various stages of the operation. This will not alter the operation performed. The data obtained will also be used to develop the system's key computer-processing features. This will enable real-time information to be given to the surgeon whilst they are performing the procedure and has the potential to make neurosurgery safer and more precise.

### Who can participate?

Patients aged 18 years and over who are scheduled for elective surgery for a diagnosis of a brain tumour, an arteriovenous malformation, or an intracranial aneurysm

### What does the study involve?

The study involves taking additional video images during neuro-oncology and neurovascular operations which will extend the operation by up to 15 minutes. The operation will be completed in the usual manner and the surgeon will not use any of the acquired intraoperative data to guide surgical management.

What are the possible benefits and risks of participating?

There will be no immediate direct benefits to those taking part, but the information acquired from this study will help improve the future treatment of people undergoing brain surgery.

Where is the study run from?

King's College NHS Foundation Trust (UK)

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

September 2021 to June 2025

Who is funding the study?

National Institute for Health and Care Research (NIHR) (UK)

Who is the main contact?

Mr Jonathan Shapey

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## Contact information

### Type(s)

Principal investigator

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**Additional identifiers****ClinicalTrials.gov (NCT)**

NCT05294185

**Integrated Research Application System (IRAS)**

284230

**Central Portfolio Management System (CPMS)**

51752

**Study information****Scientific Title**

A prospective observational study to evaluate the use of an intraoperative hyperspectral imaging system in neurosurgery

**Acronym**

NeuroHSI

**Study objectives**

To correlate hyperspectral imaging data with analysis of the corresponding biopsied brain tumour tissue and to correlate intraoperative blood supply and oxygenation levels generated from the hyperspectral imaging (HSI) data with the surgical timeline in patients undergoing blood vessel surgery.

**Ethics approval required**

Old ethics approval format

**Ethics approval(s)**

Approved 23/02/2022, London - Westminster Research Ethics Committee (Equinox House, City Link, Nottingham, NG2 4LA, UK; +44 (0)207 104 8066; abitha.paimpillchalil@hra.nhs.uk), ref: 22/LO/0046

**Study design**

Single-centre cohort observational study

**Primary study design**

Observational

**Study type(s)**

Other

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

Neurosurgery

**Interventions**

In this project, the researchers will use a HSI imaging system to record data in 81 patients undergoing brain including 63 patients with brain tumours and 18 patients suffering from brain vessel abnormalities. Using this data they will develop key computer-processing features to enable real-time image interpretation.

**Intervention Type**

Other

**Primary outcome(s)**

Intraoperative oxygenation evaluated using hyperspectral imaging data at 5-10 data points within a 15-minute intraoperative period

**Key secondary outcome(s)**

1. Imaging data relevant to the primary pathology acquired at 3 months
2. Any adverse events regarding the safety of the study will be recorded in the first 3 months

**Completion date**

30/06/2025

**Eligibility****Key inclusion criteria**

1. Adult patients aged 18 years and over
2. Patients with a diagnosis of a brain tumour (any type), arteriovenous malformation (AVM) or aneurysm who are scheduled for elective surgery
3. Patients able to provide written informed consent

**Participant type(s)**

Patient

**Healthy volunteers allowed**

No

**Age group**

Adult

**Lower age limit**

18 years

**Sex**

All

**Total final enrolment**

84

**Key exclusion criteria**

1. Patients under 18 years of age
2. Patients who have previously had brain surgery

**Date of first enrolment**

01/04/2022

**Date of final enrolment**

16/06/2025

**Locations****Countries of recruitment**

United Kingdom

England

**Study participating centre**

King's College NHS Foundation Trust

Denmark Hill

London

United Kingdom

SE5 9RS

**Sponsor information****Organisation**

King's College London

**ROR**

<https://ror.org/0220mzb33>

**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

## 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?
<a href="#">HRA research summary</a>			28/06/2023	No	No
<a href="#">Study website</a>	Study website	11/11/2025	11/11/2025	No	Yes