Participant information sheet

Neuro-qFHSI

A prospective observational study to evaluate intraoperative hyperspectral imaging for real-time quantitative fluorescence-guided surgery of low-grade glioma

PART 1

We would like to invite you to take part in our research study.
Joining the study is entirely up to you. However, before you decide we would like you to understand why the research is being done and what it would involve for you.
One of our team will go through this information sheet with you, to help you decide whether you would like to take part and answer any questions you may have. This should take about 40 minutes.
Please feel free to talk to others about the study if you wish.

The first part of the Participant Information Sheet tells you the purpose of the study and the process if you take part.

The second part will give you more detailed information about the conduct of the study.
Please ask if anything is unclear.

What is the purpose of the study

The purpose of this study is to obtain images of brain tumours during surgery using a new type of surgical camera. This is called a “hyperspectral” camera. Normal cameras work by recording visible light - and using that to generate an image. Hyperspectral cameras record this information, but also record wavelengths of light (or spectra) that we cannot see. Recent studies have suggested that when this extra information is processed by additional software it may provide extra information to the surgical team, for example on blood flow or the location of tumour boundaries.

In certain types of brain tumour surgery a type of medication called “gliolan” or “5 ALA” or “pink drink” is given before surgery. This includes a compound that builds up in tumour cells and makes them glow (or fluoresce) pink when blue light is shined on them. This helps the surgeon remove parts of the tumour that can otherwise be difficult to identify. This relies on enough pink light being emitted for the surgeon to see. Recent studies have suggested that very low levels of fluorescent light, not visible to the naked eye may be detectable using hyperspectral

imaging. Some work also suggests it can quantify exactly how much light is being emitted in real time – potentially giving surgeons live information about the tumour type and boundaries.

The study will assess how the information obtained from hyperspectral images during surgery matches the removed tissue. Data will also be used to develop the system's key computer-processing features. This will potentially enable real-time (live) information to be given to surgeons in the future whilst they are performing the procedure; and has the potential to make neurosurgery safer and more precise.

Why have I been invited?

You have been invited to take part in the study because you have a brain tumour and have been advised that you need an operation. This operation involves taking a medication on the day of surgery called "gliolan" or 5-ALA. This medication aids the surgeon performing the resection by making certain types of tumour glow, or fluoresce under blue light.
Patients from King's College Hospital will be invited to take part. We expect approximately 60 participants will take part.

Do I have to take part?

No. The decision to take part is entirely up to you. We will describe the study and go through this information sheet, which we will then give to you. You will be able to keep this information sheet and think about taking part. You are free to discuss the information with anyone you wish including your family and friends. If you agree, we will then ask you to sign a consent form to show you have agreed to take part. You are free to withdraw at any time, without giving a reason. This would not affect the standard of care you receive.

What will happen to me if I take part?

If you agree to take part in this study, we will obtain written informed consent from you. Participating in this study will not affect the treatment you receive and will not alter the surgical operation performed.
The study involves two phases, it will be explained during the consent process which stage you are being asked to participate in. This will also be recorded on the consent form you are asked to sign should you choose to take part.

Stage 1 involves using samples of tumour tissue to calibrate and test the hyperspectral surgical camera. Your operation will proceed as normal, and your surgeon will aim to remove as much tumour as safely possible. Samples of tissue removed during your surgery will be sent for diagnostic testing in Kings College Hospital. This is part of a normal tumour operation and is used to give information on the specific tumour type. Only tumour tissue removed as part of your planned operation which is extra to that required for this diagnostic testing will be used for the research study.

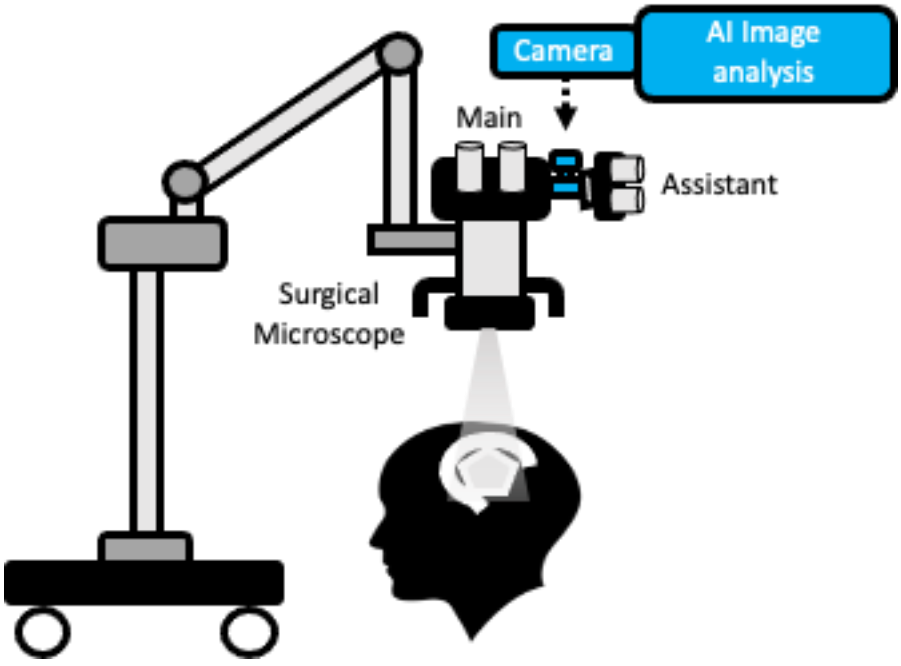
Research samples will be analysed in the lab using the hyperspectral camera and with machines that measure precisely how much fluorescent light they emit (known as a spectrophotometer and spectrofluometer). The sample will also be analysed using a microscope to assess its cellular makeup. These measurements will be used to validate the camera settings and calibrate the software that allows the camera to function in surgery. This information will be used for research purposes only and will not be available to the team involved with your normal clinical care.

20 patients will be recruited in stage 1.

Stage 2 involves taking additional video images during your operation, to assess how the hyperspectral camera functions during surgery. This will be done using a hyperspectral camera mounted to a normal operating microscope (as seen in the picture below). Your operation will proceed as normal, and your surgeon will aim to remove as much tumour as safely possible. This involves progressively removing areas of tumour. At stages throughout your operation an additional image will be taken using the hyperspectral camera. After each image has been taken, the tumour tissue removed will be sent for research analysis.
Your operation will be completed in the usual manner and your surgeon will not use any of the acquired intraoperative data to guide surgical management. ***Only tissue that would be removed as part of the usual surgery will be taken and analysed.***

Whilst the operation will not be altered by taking part in this study, the need to acquire additional images means that the time taken to complete the operation will be increased by approximately 15 minutes.

40 patients will be recruited in stage 2.



Following your surgery, you will have follow-up imaging as part of your routine clinical care. Information from these investigations will be used in the study.

Your involvement in the study will stop after you have your post-operative imaging.

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What are the possible benefits of taking part?

Taking part in this study will not help you directly but the information we get from this study may help improve the future treatment of people needing brain surgery.

What are the possible disadvantages and risks of taking part?

The risk of this research causing you any harm is extremely low.

There should be no increased risk to the operation as a result of using the imaging system. Furthermore, any imaging acquired during the procedure will not be used by the surgical team.

Who is organising and funding this study?

The doctor in charge of this study is: Mr Jonathan Shapey. The study is funded by the Wellcome Trust and is being sponsored by King's College London and King's College Hospital NHS Foundation Trust.

Your doctor is not being paid for their role in the study.

Jonathan Shapey (Chief Investigator) is an employee of King's College London (King's) and co-founder of the recently formed King's spinout Hypervision Surgical Ltd (HVS). Jonathan Shapey and King's College London are shareholders and have an equity interest in the company.

Hypervision Surgical Ltd (HVS) is a private company which is involved in developing hyperspectral imaging systems and software for surgical use. Hypervision surgical are involved as advisors in this study and will use the gathered hyperspectral data to develop their image analysis software.

How have patients and the public been involved in this study?
Service users helped develop the research topic and what research questions should be asked
Potential participants were involved in reviewing the Participant Information Sheet.
In designing this study, we have taken into account patient opinions on the frequency of participant visits and the tests that we will carry out.

Who has reviewed this study?
All research in the NHS is looked at by an independent group of people, called a Research Ethics Committee, to protect your interests. This study has been reviewed and given favourable opinion by the Research Ethics Committee. It has also been approved by the Health Research Authority and each local hospital will also give confirmation that the study can go ahead.

Expenses and Payments
There are no funds available for payments to those participating in this study.

What happens when the research study stops?
Your participation in the research study will stop after you have had your routine post-operative MRI scan after surgery. However, as a patient, your treating Consultant will continue to see you in the out-patient clinic until they feel it appropriate to discharge you from further follow up.

This completes Part 1 of the Information Sheet.

If the Information in Part 1 has interested you and you are considering participation, please continue to read the additional information in Part 2 before making any decision.

PART 2

What if new information becomes available?
Sometimes we get new information about the treatment being studied. If this happens, your study doctor will tell you and discuss whether you should continue in the study. If you decide not to carry on, your study doctor will make arrangements for your care to continue. If you decide to continue in the study he/she may ask you to sign an agreement outlining the discussion.
This new information that becomes available might specifically affect you and your health. If this happens, your study doctor might consider that you should withdraw from the study. He/she will explain the reasons for withdrawing from the study and arrange for your care to continue.

If the study is stopped for any other reason, we will tell you and arrange for your continuing care.

What will happen if I don't want to carry on with the study?
You are free to withdraw from the study at any time; and if you would like to do so; please speak to your study nurse or doctor.

Your decision to withdraw from the study will not affect the care you receive.

If you withdraw your consent; information collected about you may continue to be used if you are happy with this.
Should you choose to withdraw from the study following collection of surgical data, this anonymous information will be analysed as part of the study results. No further information will be collected from the point you choose to withdraw.

What if there is a problem?
If you have a concern about any aspect of this study, you should ask to speak to your study doctor who will do their best to answer your questions (Mr Jonathan Shapey). If you remain unhappy and wish to complain formally, you can do this through the NHS Complaints procedure by contacting your local Patient Advice Liaison Service (PALS) office. Details of your local office can be obtained by asking your study doctor, GP, telephoning your local hospital or looking on the NHS choices website. http://www.nhs.uk/pages/home.aspx

Every care will be taken during the course of this study. However, in the unlikely event that you are injured by taking part, compensation may be available.

In the event that something does go wrong and you are harmed during the research and this is due to someone's negligence then you may have grounds for legal action for compensation against King's College London and King's College Hospital NHS Foundation Trust but you may have to pay your legal costs.

Regardless of this, if you wish to complain, or have any concerns about any aspect of the way you have been approached or treated by members of staff or about any side effects (adverse events) you may have experienced due to your participation in the study the normal National Health Service complaints mechanisms are available to you. Please ask your study doctor if you would like more information on this.

Will my taking part be kept confidential?
If you consent to take part in the research, any of the information collected about you may be inspected by the sponsor (including representatives of the sponsor). These inspections are solely for the purposes of the research and analysing the results. Your records may also be

looked at by the regulatory authorities or ethics committees to check that the study is being carried out correctly.

The organisations listed above will keep information about you confidential and secure. Your name will not be used in any reports about the study and all data is stored in accordance with the principle of the Data Protection Act 2018.

Involvement of the General Practitioner/Family Doctor (GP)
With your consent, your GP will be informed of your involvement in the study.

What will happen to any samples that I give?
The tissue samples taken during surgery will be analysed for fluorescence as above, before being returned to Kings College Neuropathology. They will then be analysed by the neuropathologists at King's College Hospital and will n be stored with all the other tumour tissue obtained during your operation.

What will happen to the results of the research study?
Results from this study will be used as part of an educational project (e.g. PhD – you can find the names of the PhD fellows affiliated with this study at the end of this form).
Results from this research study will be made publicly available through publication of open-access research papers, presentation of results at scientific meetings, patient events, and online via King's College London and relevant charity and partner websites/social media.
All identifiable personal data used for research will be anonymised before publication of the results.

How we will use your data
We will need to use information from you and your medical records for this research project.

This information will include your:

- Name
- Hospital number
- Date of birth
- Contact details
- Relevant medical history
- Information regarding your tumour

People will use this information to do the research or to check your records to make sure that the research is being done properly.

Researchers may access your clinical data for study purposes during and after your participation in this study without an end point. Should you withdraw your consent to participate in the study no further clinical information will be accessed by the research team from that point.

People who do not need to know who you are will not be able to see your name or contact details. Your data will have a code number instead.

We will keep all information about you safe and secure.

Once we have finished the study, we will keep some of the data so we can check the results. Study data will only leave King's College Hospital in a format that the individual participants will not be identifiable. This will be sent to King's College London, to any publications where the results are being published. This final de-identified dataset may be given to other researchers in the future including academic and commercial collaborators to answer clinically relevant research questions and make the technology available for patient benefit.

If you agree to participate in this study, we may wish to contact you regarding similar studies which could be of interest to you. During the consent process you will be asked if you agree to be contacted in relation to other studies. Provided you agree we may then pass your contact details to the relevant research team. All similar studies will be similarly approved by a research ethics committee.

What will happen to the results of the research study?
It is intended that once the study is complete a report will be written and the results will be published in medical journals and presented at conferences. We do this to make the results available to the public and so that we can explain to the medical community what our research has found to improve healthcare in the UK and around the world. They may also be used by commercial collaborators to apply to the regulatory authorities, to make the imaging system widely available, and/or for research related to the development of future medical device(s). Confidentiality will be ensured at all times and you will not be named or identified in any publication.

What rights do I have to the results of the research?
Any information derived directly or indirectly from this research, as well as any patents, diagnostic tests, surgical or medical devices developed directly or indirectly as a result of this research may be used for commercial purposes aiming at making the technology available for patient benefits. You have no right to this property or to any share of the profits that may be earned directly or indirectly as a result of this research. However, in signing this study's consent form you do not give up any rights that you would otherwise have as a participant in research.

To ensure fair and reasonable benefits for the NHS, consent requirements and overall oversight on commercial use of the data are in place from the National Institute for Health Research (NIHR) acting on behalf of the Secretary of State for Health and Social Care

What are my choices about how your information is used?
You can stop being part of the study at any time, without giving a reason, but we will keep information about you that we already have.

We need to manage your records in specific ways for the research to be reliable. This means that we won't be able to let you see or change the data we hold about you.

Where can I find out more about how my information is used?

You can find out more about how we use your information:

- on the Health Research Authority website www.hra.nhs.uk/information-about-patients/
- in a leaflet called: HowWeWillUseYourData KCH V1 (21-11-19) – available from the study team
- at our website https://www.kch.nhs.uk/about/corporate/data-protection
- by emailing our Data Protection Officer on kch-tr.dpo@nhs.net

Thank you

Thank you for considering taking part and taking the time to read this information sheet.
If you decide to take part in the study, we will give you a copy of the information sheet and a signed consent form to keep.

Further information and contact details

INVOLVE, Alpha House, University of Southampton Science Park, Chilworth, Southampton, SO16 7NS
Telephone: 023 8059 5628
Email: involve@nihr.ac.uk

If you, your relatives or friends have any questions about participating in this study, please contact the Principal Investigator – Mr Jonathan Shapey (Consultant Neurosurgeon).
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Your doctor ..... Tel: .....

Your nurse/study coordinator..... Tel: .....