Radiotherapy for brain tumours
You and your oncologist have decided that a course of radiotherapy would be the most appropriate way of treating your cancer. When recommending radiotherapy, your doctor will have taken into account the risks and benefits of the treatment. Although there will be side effects, it is felt that the advantages for you outweigh the disadvantages.

**Consent – asking for your consent**

We want to involve you in decisions about your care and treatment. If you decide to go ahead, you will be asked to sign a consent form. This states that you agree to have the treatment and you understand what it involves. If you would like more information about our consent process, please speak to a member of staff caring for you.

The risks of receiving radiotherapy to the brain are outlined in this leaflet.

You may decide that you do not want to have radiotherapy – this is an option for you to consider. In this case, you might want to talk again with your doctor and let them know what you have decided.

You can request a second opinion on your diagnosis or treatment at any time during your consultation or treatment process. Please speak to your clinical oncologist or GP for information on how to do this.

Your key worker .................................................................

Their contact number ..........................................................
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Patient pathway

Once you have consented (agreed) to radiotherapy, you will be referred for a CT scan and radiotherapy.

Radiotherapy appointments are booked by the radiotherapy bookings team, available on 020 7188 3160.

You will attend the Cancer Centre at Guy’s Hospital for an MRI scan and planning CT scan. You will also have an appointment to have your mask made. You will be at the Cancer Centre for approximately 3 hours.

Approximately two weeks later, you will start treatment. You will be told how many treatments you will need. Appointments for your radiotherapy take approximately 30-45 minutes.

You will be followed up four to six weeks later.
What is radiotherapy?
Radiotherapy is the use of high energy x-rays to treat tumours. It works by damaging the DNA of tumour cells, causing them to die or stop growing. Side effects are generally isolated to the area you are having treated.

Treatment is given over a prescribed number of days/weeks so that only small doses (fractions) of radiation are given at a time. The treatment may last between three and six weeks. Your clinical oncologist will prescribe the amount of radiation needed, and will tell you how many treatments you will have and over how many weeks. Treatment is given on weekdays (Monday to Friday) with a break at the weekend.

It is important that you attend all of your treatment appointments.

What happens if I am also having chemotherapy?
If you are having chemotherapy as well as radiotherapy, you will have a pre-treatment appointment to visit the chemotherapy day unit at the Cancer Centre at Guy’s Hospital. This type of radiotherapy is called ‘radical chemo-radiotherapy’.

A nurse will talk to you about chemotherapy and its side effects, and will offer information on further sources of support.
What happens before radiotherapy starts?

Pacemakers – If you have a pacemaker, please tell your doctor as soon as possible. You will need to have a pacemaker check before your radiotherapy treatment.

Shunts – If you already have a ventriculoperitoneal shunt (V-P) fitted, we will need to know if it is a programmable type of shunt, prior to scanning and treatment. If you have been provided with an information card please bring this with you.

Pregnancy – All female patients under the age of 60 will be asked to confirm their pregnancy status before the first planning session starts. It is very important that you are not and do not become pregnant while undergoing radiotherapy planning and treatment. If you think you may be pregnant at any time during your course of treatment, please tell your clinical oncologist or radiographer immediately. If necessary, please speak to your GP about contraception methods suitable for use during radiotherapy.

Who will look after me during treatment?

A number of healthcare professionals will be involved in your treatment and care. Below is a list of all the doctors, nurses, specialists and departments who will look after you while you are having radiotherapy.

Clinical oncologists are doctors who are trained in the use of radiotherapy and chemotherapy. The consultant clinical oncologist will be in charge of your care. Clinical
oncologists are supported by a team of specialist registrars, therapy radiographers, nurses and administrative staff.

**Therapy radiographers** are specifically trained to plan and deliver the radiotherapy. They provide support and advice on radiotherapy side effects and their management. The radiographers will have day-to-day responsibility for you while you are receiving radiotherapy.

Your **advanced practitioner radiographer** will provide support and advice on radiotherapy side effects and their management throughout your radiotherapy treatment.

A **neuro-oncology clinical nurse specialist** will act as your key worker throughout your diagnosis, treatment and follow-up. They can provide advice on your treatment and medications, as well as looking after your emotional and psychological wellbeing.

**Preparing for your radiotherapy**
Before you come for your radiotherapy we will need to prepare you for the treatment.

You will need to wear a close-fitting plastic treatment mask. You will be wearing this mask during each radiotherapy treatment to make sure that your head is kept still, so that the treatment can be given accurately.

You will be asked to remove your shoes and clothes from the waist upwards, and we will provide you with a gown to wear. You will lie on a treatment table and be
positioned so that you are straight. This is the position that you will be in for the CT scan and for all of your treatments. Making the mask is painless and you are able to breathe normally throughout.

A thin sheet of plastic will be warmed in water to make it soften. This is then placed over your face and moulded to the bridge of the nose and chin (see figure 1). The mask will become rigid as it dries and may get slightly tighter. This is normal and will help to keep your head still. The mask-making process takes around 10 minutes but your appointment may last 30 minutes in total.

The mask needs to be a very snug fit. We therefore require that all men with facial hair (beards and moustaches) remove it completely and are clean-shaven before attending the mould room appointment. If you are planning a haircut, this must be done before attending the mould room. Your mask will be removed once it is set.

After having your mask made, you will have a CT scan with your mask on.
Radiotherapy planning
Following your initial outpatient appointment with the doctor, you will be sent a letter asking you to attend the radiotherapy department at the Cancer Centre at Guy’s for a CT scan.

Please bring your appointment letter with you. When you arrive, book in at the reception of the radiotherapy department.

A member of the pre-treatment radiotherapy team will explain what is going to happen. During this discussion you will be asked to confirm your name, address and date of birth. You will be asked for this information before every procedure / treatment undertaken in the department.

We will ask you to re-confirm consent to make sure you are certain that you would like to go ahead with the proposed treatment.

Computerised tomography (CT) scan
A CT scanner is a special x-ray machine that produces a series of detailed pictures showing the structures in your head. This scan is for planning your treatment only. The images are sent to a planning computer and used to reconstruct a three-dimensional image of your head. The clinical oncologist will then use this image along with your MRI (magnetic resonance imaging) scan data to accurately plan your radiotherapy. You may eat and drink normally on the day of your scan and throughout your treatment appointments, and there is no harm in you being around other people.
During the CT scan
You will lie on the CT table in the same position as when you had the mask made. Your mask will be placed over your face and secured to the couch. You do not need to hold your breath – you will be able to breathe freely with the mask on. A digital photograph may be taken of you in the mask. This is only used by the radiographers to set you up for treatment. The table will be raised to go through the scanner, and the radiographers will then leave the room. They will be watching you at all times on closed-circuit television (CCTV). The radiographers will start the scan from outside the room. You will feel the bed slowly move in and out of the scanner and hear the machine buzzing. The scan should only take a few minutes.

After the CT scan
The radiographers will help you down from the scanning table and you may then get dressed and leave.

What is a radiotherapy plan?
Your radiotherapy plan is the personalised design of your radiotherapy treatment. It is tailor-made for you and is based on the CT scan that you had with your mask on. A team of doctors, radiographers and physicists will work together to decide where the treatment needs to be directed.

What will happen on my first day of treatment?
When you arrive for your appointment, please book in at reception. One of the treatment radiographers will then discuss your treatment with you and you will be able to
ask any questions that you may have. You will be asked to change in a cubicle, and then taken into the treatment room where the staff will introduce themselves.

You will be asked to lie on the treatment table, which will be set up with the same equipment as when you had your CT scan. Your mask will be placed over your face, and the lights will be dimmed so that the radiographers can see the room lasers that will help them to position you correctly (Fig 2). You should relax, stay still and breathe normally. Radiotherapy treatment is given by a machine called a ‘linear accelerator’, often referred to as a ‘linac’. You will hear the machine move around you. It will come close to you but will not touch you. You will hear radiographers taking various measurements and feel the bed moving. Once you are in the right position, the radiographers will leave the room.

Fig 2
Once the radiographers have left the room you will hear a buzzing sound. This is the door safety interlock. You will be alone in the room during your treatment but the radiographers will be watching you all the time on closed-circuit television (CCTV).

X-ray images are taken regularly during your treatment to ensure that the treatment is being delivered accurately. There will be a short delay while these images are assessed and you may feel the bed move as the radiographers adjust its position from outside the room. Treatment will then be delivered and the machine will move around you to treat you from different angles. This whole process will take approximately 20 minutes.

Afterwards, the radiographers will return to the room, remove the mask and help you down from the treatment table. When you are positioned correctly, the treatment table will be quite high up, so it is very important that you do not move or attempt to get off the table without assistance. The radiographers will tell you when it is safe to sit up and get off the table.

The radiographer will talk to you about what to expect and how to look after yourself following radiotherapy. They will make sure you have the correct medication to take home with you. You can go home after they have spoken to you.
What are the side effects of radiotherapy?

Receiving radiotherapy does have side effects. The most common side effects are listed below. Your clinical oncologist will have discussed these effects with you as part of your consent to treatment. You can ask someone in your treatment team at any point if you would like clarification of these side effects.

While we cannot prevent against side effects, we can help you to manage them. Additionally, you will be reviewed by the advanced practitioner radiographer who will assess your reactions to treatment.

Side effects that occur during your radiotherapy are called ‘early’ (or ‘acute’) side effects. They usually begin to occur one to two weeks after your treatment starts. As your treatment progresses, these become more severe and are usually at their worst one to two weeks after your radiotherapy treatment finishes.

They then gradually start to improve, and by three months after the completion of your treatment, most will have resolved or at least improved considerably. Early side effects affect all patients, but the severity varies.

We use the most modern radiotherapy techniques, including intensity modulated radiotherapy (IMRT) and image guided radiotherapy (IGRT) to keep the side effects to a minimum. However, some of the side effects described below are unavoidable. We will support you and help you to manage these, with advice on diet and medication when necessary.
Possible side effects

Tiredness
You may find that you feel tired during treatment. The treatment affects your healthy cells, and although these can repair themselves, this requires extra energy. Travelling to and from hospital can also make you feel tired. Try to rest when you can, and ask your friends and family to help with any everyday activities.

Skin reaction
Radiotherapy may cause a skin reaction over the area being treated. The area may become red, dry, sensitive or begin to peel. Moisturising in the treatment area will help your skin to cope better. It is best to wait until you have started to lose hair. You may continue to use your usual moisturiser or if you need to buy one, we recommend one without the additive sodium lauryl sulphate (SLS). After treatment, apply the moisturiser sparingly twice a day or more often if your skin is very itchy.

Washing
It is important to keep the treatment area clean. Shower or bathe using lukewarm water and use your usual shampoo. Use a soft towel to gently pat the skin dry – do not rub.

Shaving
Do not wet shave the skin in the treatment area. Do not use any hair removal creams or wax near to or in the treatment area. If really necessary, a dry electric shaver can be used.
Swimming
Reduce the number of times you swim in chlorinated water as this can have a drying effect on the skin. After swimming, shower to remove excess chlorine. Discontinue swimming if the skin becomes sore.

Hair loss
Loss of hair is a problem which happens with nearly all radiotherapy treatments to the head. How much hair you may lose varies from person to person but will only occur in small patches where the x-rays have been directed.

Your doctor, advanced practice radiographer or specialist nurse will explain if this is likely to happen and where to expect some hair loss. Any regrowth usually starts four to five months after you had radiotherapy. It is unlikely that you will have significant permanent hair loss.

If you feel conscious about your hair loss, we can arrange for you to be fitted with a wig on prescription. The specialist nurse or advanced practice radiographer can help you to arrange this.

Sun
The skin in the treatment area will be more sensitive to the sun during radiotherapy. It will continue to be sensitive for at least a year after radiotherapy. In the sun, you should protect it with total sun block or cover up. In the wind use a hat or scarf. For at least a year after treatment, continue to protect your skin in the treatment area from the weather with sun block or a scarf. It will continue to be more sensitive to the sun.
Worsening of symptoms
Radiotherapy can cause swelling of the brain and this can cause your symptoms to become slightly worse. Symptoms may include headaches, weakness of the limbs, an increase in seizures, and speech or memory problems. Your steroid doses may need to be adjusted if these symptoms occur, as this will reduce the swelling.

Please speak to the radiographers, doctors or nurses as soon as you notice any change in symptoms.

Seizures or fits
There is a slight increased risk that you may have a seizure (fit) after your treatment. However, this is usually more likely if you have had seizures in the past. Your neuro-oncology team will discuss the likelihood of having a seizure with you and what to do if this happens.

Nausea
You are likely to experience nausea and dizziness after your treatment. This can last for about two weeks. The neuro-oncology team will give you advice on how to cope with this. You may be prescribed some anti-sickness medication to take for a short while.

How do I get further supplies of my medicines?
After being prescribed medicines at the hospital, take the white copy of your prescription to your GP who can continue to prescribe these for you.
Anyone with a cancer diagnosis is entitled to free prescriptions. If you do not already have a medical exemption card, you can get an application form from your GP, the oncology outpatient department, or from the Dimbleby Cancer Centre. Please ask us if you need any further information.

**What happens when treatment ends?**

On the last day of treatment, you will be given a treatment completion form summarising your treatment. We will send one copy to your GP and give you one for your own records.

**Follow-up after treatment**

Two weeks following the end of your treatment, you will be telephoned by your advanced practitioner radiographer. This is to check that you are recovering well.

You will be seen by your doctor at the Cancer Centre four weeks after your radiotherapy. Two months after this, you will have a scan and will be seen in clinic to discuss your treatment progress.

If you are having more chemotherapy, you will be seen regularly by the team to help you manage the treatment.

**Coping with cancer**

Being diagnosed with a brain tumour may bring specific concerns. You might worry about whether you will have someone to talk to about your diagnosis, whether you will be able to continue with work and social engagements, and how your personal relationships could be affected. You may find that you need extra help
to come to terms with the problems that cancer can cause. Discussing your concerns with staff, friends and family is important. It can help you to find answers to questions you may be asking yourself, as well as finding new ways to manage situations.

**DVLA driving regulations**
You need to inform the DVLA if you have a medical condition or disability that may affect your driving. As soon as you are diagnosed with a brain tumour, you are required to inform the DVLA. Failure to do so is a criminal offence. For more information go to: https://www.gov.uk/contact-the-dvla/y/driving-and-medical-issues

**Support group**
There is a monthly drop-in support group for people with brain tumours and their carers held at King’s College Hospital, **t:** 0203 299 5228.

**Additional information**
In order to improve treatments and services, audits are regularly carried out in the department. This can involve using patient notes. Any data collected will have all personal and identifiable details removed to ensure patient confidentiality. However, if this is unacceptable to you and you would prefer that your notes are not seen, please let your consultants know and your wishes will be respected.

Clinical trials are undertaken within the department, which you may be eligible to take part in. If necessary and appropriate, your doctor will discuss this with you.
### Contact us

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<tr>
<th>Service</th>
<th>Phone Number</th>
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<tbody>
<tr>
<td>Radiotherapy reception</td>
<td>020 7188 7188 (ext 57542 or 57569)</td>
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<tr>
<td>Radiotherapy bookings</td>
<td>020 7188 3160</td>
</tr>
<tr>
<td>Radiotherapy treatment support team</td>
<td>020 7188 4220</td>
</tr>
<tr>
<td>(Monday to Friday, 8.30am to 5.30pm)</td>
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<tr>
<td>Acute oncology assessment unit</td>
<td>020 7188 3754</td>
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<tr>
<td>(Monday to Friday, 9am to 6pm)</td>
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### Out of hours oncology doctor on call

If you require assistance out of hours, please phone the hospital, **t:** 020 7188 7188 and ask them to contact the oncology doctor on call. Please have your hospital number ready. The switchboard operator will take your details and ask the emergency oncology doctor to phone you back.

**If you are concerned, please go to your local emergency department.**

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**Dimbleby Cancer Care** provides cancer support services for Guy’s and St Thomas’. We have a drop-in information area staffed by specialist nurses and offer complementary therapies, psychological support and benefits advice for patients and carers.

Dimbleby Cancer Care is located in the Welcome Village of the Cancer Centre at Guy’s. **t:** 020 7188 5918  
**e:** DimblebyCancerCare@gstt.nhs.uk
Useful sources of information

The Brain Tumour Charity
\textit{t:} 0808 800 0004
\textit{w:} \url{www.thebraintumourcharity.org}

Brain Tumour Action
\textit{t:} 0131 466 3116
\textit{w:} \url{www.braintumouraction.org.uk}

Cancer Research UK
\textit{t:} 0808 800 4040
\textit{w:} \url{www.cancerhelp.org.uk}

Macmillan Cancer Support (freephone)
\textit{t:} 0808 808 0000 (information on all aspects of cancer)
\textit{w:} \url{www.macmillan.org.uk}

Pharmacy Medicines Helpline
If you have any questions or concerns about your medicines, please speak to the staff caring for you or call our helpline.
\textit{t:} 020 7188 8748 9am to 5pm, Monday to Friday

Your comments and concerns
For advice, support or to raise a concern, contact our Patient Advice and Liaison Service (PALS). To make a complaint, contact the complaints department.
\textit{t:} 020 7188 8801 (PALS) \hspace{1cm} \textit{e:} pals@gstt.nhs.uk
\textit{t:} 020 7188 3514 (complaints) \hspace{1cm} \textit{e:} complaints2@gstt.nhs.uk