



**University Hospitals Birmingham**  
NHS Foundation Trust



# Stereotactic Ablative Body Radiotherapy (SABR) for Lung Cancer (CyberKnife)

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This leaflet aims to provide information for patients and relatives about stereotactic ablative body radiotherapy (SABR) in lung cancer treatment.

This leaflet explains:

- General information on SABR
- Planning and delivery of the treatment
- The side effects you may experience during and after treatment
- Who to contact for advice

Your clinical oncologist will discuss your treatment in detail with you answering any additional questions you may have.

## What is stereotactic ablative body radiotherapy?

Radiotherapy is a treatment for cancer using high energy radiation, in the form of X-rays. It works by damaging tumour cells to stop them from growing or causes them to die. The purpose of radiotherapy is to destroy the cancer cells whilst causing as little damage as possible to normal cells. SABR is an effective way of giving focussed radiotherapy, increasing the chance of controlling the tumour whilst sparing the normal tissues. It does this by using:

- Fewer treatment sessions (either 3, 5 or 8)
- Smaller radiation fields
- Higher doses of radiation

Conventional radiotherapy is the typical alternative treatment to SABR which usually consists of 20 treatments over 4 weeks. Other alternatives include radiotherapy to help control your symptoms or no treatment at all, both of which result in poorer tumour control.

## Planning your treatment

You will need to attend three appointments in the radiotherapy department before starting your treatment. These will generally happen on one day and in total take around four hours.

## Appointment one: Checking you are suitable for treatment on CyberKnife

During this session, you will be asked to lie on a couch with your arms by your side; please let the radiographers know if you are uncomfortable as you will need to be able to lie in exactly the same position for the duration of your planning session and treatments. The radiographers will ask you to practice holding your breath; both with you having exhaled (taken a breath out) and inhaled (whilst breathing in). We need you to do this for the CT scan only. You will not need to do it for treatment.

## Appointment two: Planning CT scan

After your breathing practice on the CyberKnife unit, you will have two CT scans of the treatment area. The first CT scan will be done with you holding your breath having breathed out and the second with you having breathed in. Doing these two scans will enable us to assess how much your tumour moves with breathing. You will be given permanent tattoos (small dots) after the CT to enable us to reproduce the position that you are scanned in for your next appointments.

After the CT scan the physicists will work to produce a mock plan. This takes around an hour to produce and we will ask you to wait whilst this is done.

## Appointment three: Dummy run

We will then take you back into the CyberKnife unit and ask you to lie down in the same position as before. The radiographers will then leave the room and you will feel the bed moving but will not see or feel anything else. We will ask you to breathe normally for this. The radiographers will take some x-rays. This to check that your tumour is visible on the x-rays and that CyberKnife is suitable for you. This generally takes around twenty minutes.

We will endeavour to do all these appointments on one day where possible.

## What happens when I come for radiotherapy?

SABR is given in 3, 5 or 8 treatments, usually on alternate working week-days and will start around 2 weeks after your planning CT scan. The treatment is usually completed within three weeks and will last for about between 1-2 hours each time.

The radiographers will explain what is going to happen and when you have no more questions, then the radiographers will ask you to lie on the treatment couch where they will position you in the same way as you were for your planning CT scan. When you are comfortable the radiographers will then move you into the correct position. Please remain relaxed and still.

X-ray images will be taken in the treatment room before and during treatments so that the radiographers can ensure the radiotherapy is delivered accurately. This involves a very small additional dose of X-rays and ensure that you are in the correct position for accurate treatment which overall serves to reduce the risk of side effects. Assessing these images may take some time and necessitate discussion with other members of the wider team such as physicists and doctors. The images cannot be used to assess how well the treatment is working.



The radiographers may come in and out of the room and adjust your position slightly. You will then see the machine move around you so that the treatment can be delivered from lots of different angles. The machine will only be on for a few minutes at a time. You do not feel

anything whilst the treatment is being delivered but you may hear the machine buzzing on and off.

The radiographers cannot stay in the room with you whilst the machine is on but they are operating the machine and watching you all the time on cameras and listening to you via an intercom. If for any reason you need the radiographers then just call out and they will immediately stop the treatment and come in. You are welcome to bring a CD with you so you have something to listen to whilst you have your treatment.

**CCTV USE:** The treatment rooms are monitored during your preparation, positioning and treatment delivery by television cameras. This is part of ensuring the accuracy of your treatment and your safety and well being in the rooms at all times. We assure you that the camera image feed is live and it is not possible to make a recording. The images are viewable on screens situated in the machine control areas. The control areas are only accessed by authorised radiotherapy staff, some of whom may not be directly involved in your care at the time. If you have any concerns about your privacy or dignity, that you have not already discussed then please do not hesitate to highlight your concerns during the information discussion with the radiographers at your first appointment.

## Early side effects of treatment

Early reactions to SABR occur during or up to 6 weeks after completion of your treatment; these are usually temporary and include:

### **Tiredness/fatigue**

- It is common to feel more tired than usual in the weeks following completing your radiotherapy
- Ensure you drink plenty of fluids and rest. This will gradually resolve

### **Skin reactions**

- Skin reactions are extremely rare, but if your skin becomes uncomfortable, ask the radiotherapy team for advice

## **Shortness of breath and/or raised temperature**

- Sometimes following radiation treatments for tumours within the chest, the lung tissue may become inflamed. This lung inflammation from radiotherapy is termed 'radiation pneumonitis'. It can result in symptoms of breathlessness, wheezing, cough or fever lasting up to 6-12 weeks following completing the treatment, and can be mistaken for a chest infection. Please seek advice from the radiographers or GP before using antibiotic medication
- Pneumonitis is rare, and is less likely to happen in lung SABR than in conventional radiotherapy. If pneumonitis is suspected, your Clinical Oncologist may prescribe you oral steroid tablets to reduce the inflammation and help to relieve your symptoms

## **Chest pain**

- If your lung tumour is close to the chest wall, you may experience some chest, rib and back pain following SABR. This is usually mild and relieved with simple painkillers such as paracetamol. If the pain is more severe, please seek advice from your radiotherapy team

## **Swallowing difficulties**

- SABR can occasionally cause your gullet to become inflamed resulting in some discomfort and difficulty in swallowing
- This is uncommon in SABR compared to conventional radiotherapy and can normally be managed by drinking lots of fluids and eating soft foods. Seek advice from your radiotherapy team if you are not managing

## **Late side effects of treatment**

Late reactions occur after 3 months following completion of treatment and some of these reactions may be permanent; your clinical oncologist will discuss the late side effects with you.

Some late side effects include:

### **Lung scarring/collapse**

- Occasionally, part of the treated lung may eventually collapse. This collapse generally affects only a small portion of the lung

- If a portion of the lung collapses, you may feel short of breath and may need to receive oxygen. Rarely, a few patients may require oxygen therapy permanently as a result of SABR. The chance of this happening is very small
- The risk of lung damage and breathing problems following SABR is likely to be smaller than the risk after conventional radiotherapy treatment

### **Chest wall pain/rib fractures**

- There is a small chance that radiotherapy to tumours close to the ribs may weaken the ribs, causing pain and possibly rib fractures
- This does not cause symptoms in most patients however a small number of patients with a rib fracture as a result of SABR may experience pain requiring painkillers, sometimes for a long period of time

### **Upper arm nerve damage**

- For tumours close to the top of the lung, there is a very small chance of the radiotherapy damaging the nerve bundles (brachial plexus) going to the arm. This may result in weakness or numbness in part of the arm. The risk of this is very small as great care is taken to avoid or minimise radiation doses to these nerves

### **Secondary malignancies**

- Ionising radiation carries a small risk of causing another cancer many years after treatment; however this risk is extremely small compared to other factors such as tobacco

## Other information

### Contact details

Your clinical oncologist will see you regularly after your treatment. If you have any problems or questions please contact the Lung specialist or radiographers.

**Lung Specialist Radiographer: Emma Wingate**

**Telephone : 0121 371 3554**

If there is no answer then please leave a message so one of the radiographers can call you back. This telephone will be checked regularly throughout the week but not checked at weekends.

### Car parking

Car park D is directly opposite the doors to the Cancer Centre on the hospital drive. If you park here and bring along the ticket you have taken to access the car park, the radiographers in the treatment room will exchange this for a prepaid one so you can exit the car park. Free parking has only been negotiated for patients who are attending for radiotherapy planning or treatment appointments, therefore unfortunately the radiographers will not be able to give you a ticket if you are attending for a follow-up appointment.



The Trust provides free monthly health talks on a variety of medical conditions and treatments. For more information visit [www.uhb.nhs.uk/health-talks.htm](http://www.uhb.nhs.uk/health-talks.htm)

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