Total Body Irradiation

Information for patients
This leaflet aims to help you and your family understand more about your Total Body Irradiation treatment.

It is given to you in addition to the information you will receive from your clinical oncologist (who is a specialist doctor in cancer treatment). Their team will be caring for you during your treatment. This team includes doctors, physicists and radiographers.

The leaflet describes the radiotherapy test dose and treatment. It also explains the side-effects which you may experience during and after treatment.

Each person’s treatment will vary, so the information given is a general guide. The healthcare team looking after you will explain your treatment and the side-effects in detail. If you hear any words or phrases that you do not understand, please ask your doctor or a member of your healthcare team what it means. It does not matter how many times you ask.

Staff will make every effort to meet your individual needs or will direct you to the person who can help.

All your radiotherapy planning and treatment will take place in the Radiotherapy Department on Level -2, Bexley Wing, Leeds Cancer Centre (LS9 7TF).

Please do not bring any valuables into hospital with you as the Trust cannot accept liability for loss or theft.
What is Radiotherapy and Total Body Irradiation (TBI)

Radiotherapy is the use of high energy X-rays to treat cancer. TBI is a type of radiotherapy used to prepare you for a stem cell or bone marrow transplant (BMT). It is given in combination with chemotherapy to kill any remaining cancer cells and help your body to accept the donor marrow.

Some transplant types will only require a single radiotherapy treatment whereas others may require up to eight treatment visits.

The organs of the body are made up of tiny building blocks called cells. During total body irradiation all the cells in your body receive a dose of radiotherapy but most will recover in the weeks following treatment. Side-effects are explained on pages 8-10. You do not feel anything during your radiotherapy treatment and it does not make you radioactive.

You will have your radiotherapy on a treatment machine called a Linear Accelerator as shown here.
The radiotherapy team

Clinical Oncologist
This is a specialist doctor in cancer treatment. He or she will be responsible for consent review and prescribing your course of radiotherapy.

Radiographers
Male and female therapy radiographers are specialists, trained to use the equipment used to deliver your radiotherapy. They will see you when you attend for your test dose and each radiotherapy treatment.

Radiotherapy Physicists
Radiotherapy physicists work with the other members of the team to plan your radiotherapy treatment. They perform calculations to make sure that you receive the correct dose of radiation.

Students
The Radiotherapy Department is a training centre for male and female radiographers. They are supervised at all times. If you do not wish students to be present please speak to a member of staff. This will not affect your treatment or care.
Pregnancy

It is advisable that women do not become pregnant while having treatment because both the chemotherapy and radiotherapy can have an effect on the unborn child. It is suggested that you use a barrier form of contraception (e.g. condoms). For more information see the ‘Contraception and pregnancy during cancer treatment’ leaflet. Please do not hesitate to ask your doctor, nurse or radiographer if you have any questions or concerns about these issues.

Planning your treatment

Before your TBI you will have an appointment to see the clinical oncologist in the haematology department on Level 3, Bexley Wing. You will be given an appointment to attend the radiotherapy department for a ‘test dose’. These may be separate appointments, or combined in one visit and will usually be about two weeks before your radiotherapy treatment.

When you see the clinical oncologist, he or she will explain the test dose and treatment, any possible side-effects and answer any questions that you might have. It is a good idea to make a list of any questions before you attend for this appointment.

Why do I need a test dose of TBI?

We use the test dose to plan your TBI treatment. You will receive a very small dose of radiotherapy at this appointment which will not cause you any after effects. The dose of radiotherapy across your body will be carefully recorded and measurements are used to produce an individual treatment plan for you.
The test dose is exactly the same set up and process for your actual TBI treatment, except that the dose of radiotherapy given is very much smaller.

**What happens at the test dose?**

There will be several staff in the treatment room with you at first, they are radiographers and radiotherapy physicists. They will help you to get into the right position in a large, mouldable bean bag for your test dose. Once in the correct position, you will have small sensors taped to various parts of your body to measure the dose of radiation to each area.

A perspex screen will be placed between you and the treatment machine. Both the radiographers and radiotherapy physicist will leave the room to switch on the machine. You will only be alone for a few moments at a time. The radiographers will be watching you on a Closed Circuit TV monitor (CCTV) to make sure you are ok. The CCTV camera is not recording or saving any images.

There is also an intercom system so the radiographers can talk to you.

You will receive half of the test dose facing the radiotherapy machine. The radiographers will then come into the room to turn the couch around and the other half of the test dose will be given with your back to the machine. The treatment machine will only be on for 1-2 minutes in total. You will not feel anything while you are having your radiotherapy. This whole procedure takes about 20-30 minutes in total, and you will be fine to go home as soon as it is finished.
What position will I be in for the TBI?

You will lie on your side in a ‘bean bag’ on an adjustable couch, which is four metres away from the treatment machine. A perspex screen will be placed in front of the couch during treatment.

This is to make sure that your whole body receives the right dose of radiation. The screen and the radiotherapy machine will not touch you.

What should I wear?

It is helpful if you can wear trousers without any metal such as leggings or tracksuit bottoms, and a tight fitting T-shirt. This will avoid the need to undress completely.

How is TBI given?

You will be an inpatient for your TBI treatment, staying in a side room on the haematology ward. Treatment is twice a day. You will have between one and eight treatments depending on your diagnosis and the type of transplant you will have. Each treatment lasts about half an hour. Most of this time is spent making sure that you and the treatment machine are in the right position for the treatment. The radiotherapy machine will be on for about ten to fifteen minutes of this time. If you wish you can bring a music CD to play whilst the treatment is being given.
During the TBI you are in the same position as you were for the Test Dose. During some treatments the sensors may be used again to check the dose of radiation.

**Will I feel ill during or after the TBI?**

You will be given an anti-sickness injection through your Hickman line before each radiotherapy treatment. If you still feel sick after the treatment, please tell the nurses on the ward.
Short term side-effects

The possible side-effects listed below are much less likely for people having only one or two TBI treatments. Your clinical oncologists will talk about your individual risk of developing side-effects. This will depend on the type of transplant that is planned.

The side-effects of TBI may include:

- **Redness of the skin** which settles about two to three weeks after your radiotherapy has finished.
- **Swelling of the salivary glands** which settles within days after your radiotherapy has finished.
- **Soreness of the mouth, throat and difficulty in swallowing.** This usually lasts two to three weeks. You will be given pain relief as needed.
- **Diarrhoea.** This lasts about three to five days and starts after the radiotherapy has finished. You will be given anti-diarrhoea capsules.
- **Tiredness and sleepiness.** This may occur a few weeks after your radiotherapy has finished and usually lasts a few weeks.

Very rarely a condition, called veno-occlusive disease, can develop where the small veins of the liver become inflamed. This is a serious problem that can affect how the liver works. You will be monitored for any early signs of this.
Long term side-effects

Eyes
The commonest long term side-effect of TBI is cataracts. Your vision will be checked regularly in an outpatient clinic. If you do develop cataracts these can be treated with surgery.

Hormones
TBI, like chemotherapy, affects the cells of the ovaries or testes and usually results in infertility. Early menopause may also develop. TBI may result in low levels of other hormones such as thyroid hormone many years after treatment. This can be corrected with tablets.

Lungs
Pneumonitis is inflammation of lung tissue and can develop in a small number of people six weeks to six months following TBI. This can cause shortness of breath or cough.

Heart
Radiation to the heart can increase the long term risk of heart disease such as heart attacks many years after TBI. To reduce other risks of heart disease, it is important to follow a healthy lifestyle. For example:
• Taking regular exercising,
• eating a balanced diet, and
• not smoking.

Brain
TBI can occasionally have a subtle effect on higher mental function (how your brain works) some years after radiotherapy. An example of this could be developing problems in short term memory.
**Other Cancers**

The radiotherapy from TBI can result in a small risk of developing other cancers. The risk is very small compared to the potential benefit of treatment. You will be advised not to smoke and to protect your skin from the sun in the future to minimise this risk. Women will also be advised on screening for breast cancer.

**Hotel Bexley Wing**

The hotel is located on the 8th floor of Bexley wing and offers single and double rooms each with an en-suite, tea and coffee making facilities and digital television. Single rooms with wheelchair access are also available. Patients are able to stay free of charge. There is a charge for relatives if they are staying in their own room. For further details please contact the Hotel Coordinator on 0113 206 7687. Out of hours please contact the Non-surgical Oncology Nurse Practitioner through the main switch board on 0113 243 3144.

**Useful organisations and contact numbers**

**Leeds Cancer Support**

Leeds Cancer Support complements care provided by your clinical team. We offer access to information and a wide range of support, in a welcoming environment for you, your family and friends.

We can be found in the information lounges in Bexley Wing and also in the purpose built Robert Ogden Macmillan Centre.
The Robert Ogden Macmillan Centre
The Centre is on the St James’s Hospital site and offers a variety of support services including counselling, support groups and complementary therapies. You can just drop in for a coffee and a chat anytime. Open from 10am - 4pm Monday to Friday.

**Information Lounge Level -2 Radiotherapy Department**
Open from 8.30am - 6.00pm Tel: *(0113) 206 7603*

**Information Centre Level 1 Outpatients Department**
Open from 10.00am - 4.00pm. Tel: *(0113) 206 8816*

**Robert Ogden Macmillan Centre**
Open from 10.00am - 4.00pm. Tel: *(0113 206 6498)*

All the above services can be emailed on: cancersupport@leedsth.nhs.uk

**Macmillan Cancer Support**
Freephone 0808 808 0000, 9am to 6pm Monday to Friday
A textphone service for deaf and hard of hearing people on 18001 0808 808 0000.
website: [www.macmillan.org.uk](http://www.macmillan.org.uk)

**Cancer Research UK**
website: [www.cancerhelp.org.uk](http://www.cancerhelp.org.uk)