

# **Total Body Irradiation (TBI) Information for patients**

**Northern Centre for Cancer Care (NCCC)  
Freeman Hospital**

NORTHERN CENTRE FOR  
CANCER CARE



## **Introduction**

This leaflet has been produced to provide information about total body irradiation (TBI) and aims to answer some of the questions often asked by patients and their carers.

We hope you will find this helpful. If you have any further questions relating to treatment, please do not hesitate to ask your radiographer or your oncologist at the Northern Centre for Cancer Care (NCCC).

## **Total Body Irradiation**

Treatment of the whole body with radiotherapy is sometimes used to prepare the body for a bone marrow transplant.

The radiotherapy is used to

- Help get rid of the existing bone marrow to make space for the transplanted marrow.
- Try and kill any malignant cells that have not been killed by the chemotherapy.
- Suppress the body's immune system and reduce the chance of rejection of the transplant.

Usually the radiation dose is spread out over several days. Often treatment is given twice a day for three or four consecutive days. This can vary depending on the type of transplant. At each session the patient usually spends more than half an hour in the treatment room. Some of this time is spent getting them into the correct treatment position.

## **Pre-treatment**

Before treatment you will attend two planning sessions within the department. The first appointment involves having a C.T. Scan to help plan the treatment. A very small permanent mark (tattoo dot) is then applied to your chest for reference purposes. They can be removed later by laser treatment if required. The second appointment is a simulation (trial run) of the treatment procedure called a "test dose" where a small dose of radiation is given to ensure that the correct dose for the treatment will be given evenly throughout the body.

## **T.B.I. Treatment**

Radiotherapy does not hurt. You won't feel anything unusual whilst having the treatment (it is similar to having a normal x-ray). The treatment machine is big and makes quite a loud buzzing noise during treatment. You will be in the room for up to thirty minutes. The machine is only switched on for part of this time.

The machine does not touch you but you have to lie still. Lying still can be very difficult for some children, especially very young ones. Occasionally a general anaesthetic is used for children.

## **Side effects**

There are always side effects to radiotherapy and these can be worse if chemotherapy has also been given. Most side effects can be relieved with medication but sometimes not completely. Some of the side effects happen immediately, some of them happen soon after finishing the course of TBI and some take a longer time to appear.

### **Immediate side effects**

- Everyone is given anti-sickness tablets so nausea and sickness is not usually a problem.
- The salivary glands sometimes swell up after the first treatment. This can be uncomfortable but mild painkillers usually help.

### **Side effects after completing treatment**

- Hair loss will start about two to three weeks after treatment. It usually starts to grow back about three months later but it may take longer for some people.
- Sore throat and gullet (oesophagus) can be a problem, starting about seven to ten days after the treatment finishes. It can make eating and drinking difficult for a week or two. Painkillers will help.
- Diarrhoea often occurs ten to fourteen days after the treatment starts. Medicines and fluids can be given to help. It may last for a week or two.
- Radiotherapy can make you very tired. This is at its worst near the end of each treatment and just afterwards.
- Some patients may experience fatigue that can start four to six weeks after the completion of radiotherapy. This might continue for up to six weeks.
- The lungs are especially sensitive to radiotherapy and occasionally inflammation can occur in some patients within a few weeks of finishing treatment which may cause shortness of breath and a cough. This will usually settle within a few weeks and steroid tablets may be needed.

### **Long term side effects**

These are the hardest to predict and unfortunately when they do happen, they are permanent.

- The pituitary gland (in the brain) is damaged by radiation. It controls other glands in the body. Endocrinologists (doctors specialising in hormones) will help deal with any problems and advise on the replacement of hormones normally produced by the pituitary.
- The thyroid gland (in the lower neck) can also be affected by radiation. It may become under-active or occasionally overactive up to many years after treatment. Both conditions show up on blood tests and can be treated.
- Fertility is likely to be affected because both the ovaries and testicles are sensitive to radiation. Options for overcoming infertility can be discussed at the appropriate time. Men and boys usually continue to produce their own testosterone and therefore male sexual function and development continues normally. In pre-menopausal women and girls hormone replacement therapy (HRT) is likely to be required to maintain normal development and periods. Fertility treatment may be necessary in the future.
- Cataracts may develop, however surgery for cataracts is usually very straightforward and successful.
- The radiation dose to the heart is very small and unlikely to cause significant damage above that which would be expected by the chemotherapy. However any damage to the heart could be made worse by

recreational drugs or smoking. It is important that any doctor you visit knows your full medical history.

- It is possible for lung function to be affected by radiation treatment and chemotherapy. Lung studies may show some abnormality even after a low dose of irradiation. Symptoms might never occur, but if they do, are likely to be mild. It is very important that anyone that has received this treatment never smokes.
- Both radiotherapy and chemotherapy may affect the kidneys. The function of the kidney and blood pressure will be monitored at follow-up.

### **Additional side effects in children:**

#### **Growth and development**

- The pituitary gland (in the brain) is damaged by the radiation and does not produce growth hormone. This means that young children might not grow to be quite as tall as they would have been, however growth hormone injections can improve things.
- It is possible for radiotherapy to affect learning ability, especially when very young children's brains are treated. Research indicates that by three or four years after treatment young children can find it difficult to learn new information and skills. We need to know if a child is having problems at school so that we can arrange support. If needed, one of our neuropsychologists will see the patient before treatment starts and yearly afterwards.
- We are finding that, very rarely, children who have had treatment for one tumour can develop another type of tumour some years later. Smoking significantly increases the risks of developing other tumours. It is very important that anyone that has received this treatment never smokes.

Your oncologist will have discussed these side effects at the time of obtaining consent for treatment.

During follow-up we will be looking out for all of these problems.

### **Useful contacts:**

Northern Centre for Cancer Care  
Macmillan Information and Support Centre  
0191 2138611 (out of hours: - voicemail service)  
Opening hours  
Monday to Friday from 9am to 4.30pm

Newcastle upon Tyne Hospitals NHS Foundation Trust  
[www.newcastle-hospitals.org.uk](http://www.newcastle-hospitals.org.uk)

Macmillan Cancer Support  
freephone 0808 800 0000  
[www.macmillan.org.uk](http://www.macmillan.org.uk)

Leukaemia & Lymphoma Research  
020 7504 2200  
E-mail [info@beatingbloodcancers.org.uk](mailto:info@beatingbloodcancers.org.uk)  
[www.beatingbloodcancers.org.uk](http://www.beatingbloodcancers.org.uk)

Maggies Centre (Newcastle)  
0191 2336600  
E-mail [newcastle@maggiescentres.org](mailto:newcastle@maggiescentres.org)

The Patient Advice and Liaison Service (PALS)  
0800 032 0202  
FREEPOST, RLTC-SGHH-EGXJ, North of Tyne PALS,  
The Old Stables, Grey's Yard, Morpeth, NE62 1QD  
E-mail [northoftynepals@nhct.nhs.uk](mailto:northoftynepals@nhct.nhs.uk)

If you would like further information about health conditions and treatment options, you may wish to visit the NHS Choices website at [www.nhs.uk](http://www.nhs.uk).  
On this website there is an information prescription generator [www.nhs.uk/ips](http://www.nhs.uk/ips) which brings together a wealth of approved patient information from the NHS and charity partners which you may find helpful.

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