Total body irradiation (TBI)

Total body irradiation (TBI) means treatment of the whole body with radiotherapy. It is used to treat certain cancers such as leukaemia and lymphoma, and is sometimes used to prepare the body for a bone marrow transplant.

While you are having TBI treatment, you will need to stay in hospital as an inpatient.

This factsheet explains what to expect at your TBI treatment appointments. It aims to answer some of the initial questions you are likely to have, but if you would like more information or have any concerns, please speak to a member of your healthcare team who will be pleased to advise you.

Before your treatment

Before you start your TBI treatment you will have a CT scan, which will provide us with the information needed to plan and prepare your treatment.

It's important for you to remain still during the scan. Try to relax and breathe normally.

Once the CT scan is complete, you will be taken to a treatment machine and positioned to receive your treatment. You will be standing inside a specially designed frame, which has various supports that will be adjusted to fit you. The radiographers will take several measurements, which will be recorded and used to ensure you are in the same position for each treatment. They will also take a couple of x-ray images.

The week before your treatment begins, you will have a 'verification' appointment. This is to check your treatment position and ensure that your treatment will be delivered exactly as planned.

You will already be an inpatient, so we will liaise with your ward about coming to the radiotherapy department for your appointment.

Treatment procedure

TBI treatment is given twice a day - once in the morning and again in the afternoon, with a minimum six-hour gap between treatments.

Please wear loose, light-fitting clothing without zips. It's important that you do not wear anything metallic, including jewellery.

When you enter the treatment room, you will be asked to confirm your name, date of birth and address. This will be repeated at each treatment. The radiographers will then take time to position you carefully. Please try to remain still throughout your treatment.

Small measuring devices will be placed on your skin at the beginning of each treatment, but will be removed before you leave. X-ray images will also be taken to ensure that you are in the correct position.

Each treatment takes roughly 30 minutes. If you need a break at anytime, raise your hand and the radiographers will pause the treatment and enter the treatment room. Treatment can be resumed once you feel ready to continue.

Side effects

Radiotherapy can cause side effects, which you may begin to notice during or after your treatment course is complete.

It's important to remember that treatment reactions are very individual and that the severity will vary from person to person. You may experience some of the side effects below.

Main side effects that occur during treatment

Effects on the skin

Over time, the skin in the area of treatment may become red and itchy. This usually occurs seven to ten days after radiotherapy has finished, but following the skin care advice below will help to minimise any reaction:

- treat the area gently
- avoid vigorous rubbing and instead pat dry with a soft towel
- avoid extreme temperatures of water while washing
- use your normal washing products (don't suddenly change brands or use a new product while you are having radiotherapy)
- moisturise sparingly with a moisturiser that you have used previously
- wear loose fitting clothes made from natural fibres that will not irritate your skin
- avoid exposing the treated area to the sun or cold wind

Dry mouth

This usually occurs two to three days into treatment and can last for up to three months. Follow the mouth care advice given to you by the ward nurses. It's important to keep hydrated by drinking plenty of water.

Sore mouth

This usually starts a few days after you have had your bone marrow/stem cells transferred. Continue to use your mouthwash four times a day and let the nurses and doctors looking after you know when your mouth starts to get sore. They will be able to prescribe some painkillers to help control the pain. This should have settled by the time you go home and you will normally start noticing an improvement when your marrow/stem cells start growing again and your blood counts begin to recover.

Hair loss

Hair (including body hair) usually begins to fall out 15 days after radiotherapy. Most hair loss is temporary and will start to grow back within two to three months. If you would like a wig, we can arrange this before your treatment starts or you can organise one via your nurse specialist.

Nausea (feeling sick) and vomiting
You may become nauseous. This can be controlled using anti-sickness drugs (called anti-emetics) that can be prescribed by your doctor. You will be given them before each treatment. Alternatively, food and drinks containing ginger, such as ginger beer, tea or biscuits, can help.

Diarrhoea
This is a fairly common side effect that usually occurs eight to ten days after starting treatment. Please discuss with your nurse and/or doctor on the ward who can give you some advice.

Tiredness (fatigue)
As the treatment progresses, you may become more tired, but we would encourage you to take a little light exercise and to drink plenty of water to reduce fatigue. You might experience a particularly sleepy spell six to 12 weeks after treatment. This may continue for two to six weeks or longer. You may notice that you lack energy and enthusiasm to do anything, but this will resolve slowly without any specific treatment.

Emotions
People having TBI treatment can often feel very emotional during their radiotherapy and for several weeks afterwards. This kind of depression is usually short term but it can be difficult for you and your family. It is important to know that there is help available if needed.

Long term side effects of TBI treatment

Clouding of the lens of the eye (cataracts)
It is possible that you will develop cataracts (which means the lens of your eye clouds over, making it difficult to see). Cataracts usually develop three to four years after TBI treatment and affect 30 to 40% of people (three to four in ten). If cataracts form, they can be removed by a simple surgical procedure. You should be seen by an optician every two years who will be able to monitor any development.

Infertility and pregnancy
Unfortunately, you may be unable to become pregnant or father a child naturally after TBI treatment and high dose chemotherapy. However, this is not 100% guaranteed, so do not rely on this as a method of contraception. You may have had sperm banking or egg/embryo/ovarian tissue preservation before starting chemotherapy. If this is the case, it is advisable to not consider trying for a baby for at least two years after you have completed treatment or until your doctor advises you that it is safe to do so.

Early menopause
In women, TBI treatment may cause early menopause. This is due to the combination of chemotherapy and radiotherapy. You may experience symptoms such as hot flushes, dry skin and dryness of the vagina. This can happen a few months after treatment has been completed and if necessary, you can be referred to a specialist.

A second cancer
The combination of chemotherapy and radiotherapy treatment can increase your risk of getting a second cancer. This is a worrying thought, but it's important to remember that it is a very small risk and is less of a risk to your health than if the leukaemia, lymphoma or myeloma was not treated.

Lung changes (pneumonitis)
This is inflammation of the lung tissue. In a very small percentage of people, it can occur six weeks to six months following TBI treatment. You may experience shortness of breath and a cough. If this occurs, please inform a doctor or specialist nurse as soon as possible.

Liver and kidney damage
Although not common, the combination of chemotherapy, radiotherapy and bone marrow transplant may cause damage to your liver or kidneys. Your kidney and liver function will be checked at every clinic appointment as part of your routine blood tests after your transplant.

Underactive thyroid
The thyroid gland produces hormones that regulate our body metabolism. Low levels of these hormones can cause weight gain, tiredness, constipation and dry skin. You will have blood tests to check your hormone levels. If they are low, you can take thyroid hormone tablets.

Always discuss any symptoms that are worrying you with your radiographers or doctor, as there might be something that can be done to help.

Macmillan cancer information and support centre

The centre offers a range of services to support you and your family and carers. It is located on B level in the East Wing Courtyard at Southampton General Hospital. Opening hours are Monday to Friday, 10am to 4pm. Drop-in sessions are available or you can book an appointment by calling **023 8120 6037**.

Useful links

www.cancerresearchuk.org/about-cancer/cancers-in-general/treatment/transplant/TBI-total-body-irradiation

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For help preparing for your visit, arranging an interpreter or accessing the hospital, please visit **www.uhs.nhs.uk/additionalsupport**

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