

Information resources for families

Total body irradiation

Total body irradiation (TBI) is an important part of the stem cell (bone marrow) transplant process. Before receiving the transplant, your child will be given chemotherapy and TBI therapy to prepare the body for new and healthy stem cells. TBI is given before the chemotherapy.

What is TBI?

TBI is treatment to the whole body with high-energy X-ray or radiation beams. The beams made by radiation therapy machines are much more powerful than a normal X-ray, but they still cannot be seen or felt. TBI is used to destroy cancer cells in places chemotherapy cannot reach. These places include the bones, brain, ovaries and testes. TBI also suppresses the immune system and prepares the body to accept the new donor stem cells. Before a stem cell transplant TBI is usually given two times a day for three to four days.

If you have any questions, please ask.

Getting ready for TBI

About two to four weeks before your child receives TBI, you will go to the Radiation Oncology Department at your health service. You and your child will meet specialist doctors, nurses, radiation therapists and play/music therapists who will help prepare you and provide you with more information about TBI. This initial meeting and preparation for TBI (which includes a CT scan) will take two to three hours. The staff will show you and your child how the TBI is given. During this visit, the doctor will discuss the side effects of TBI and you will be asked to sign a consent form.

The radiation therapists will perform a CT scan which will allow them to accurately plan your child's treatment. This is a quick scan with no injections and your child can breathe normally. Please remove all metal objects from your child (including safety pins and jewellery) before this scan and before each treatment. During the scan parents are asked to leave the scanning room for a short period while the scan occurs. You will then be able to return to your child.

Taking care of your child during TBI

- Keep following your child's mouthcare routine. The nurses will give your child medicines prescribed by the doctor to prevent or stop nausea and vomiting.
- Do not use any oil-based lotions on your child's body during the days of TBI. These lotions can interfere with treatment; use only lotions that are ordered for your child by the doctor or nurse. After the last TBI is finished, your child can use his/her choice of lotions to keep the skin soft and moist.
- Only use mild soaps, such as Dove®. Your child may use the soap that is provided on the transplant unit for bathing. Avoid deodorant soaps.
- If your child has pain in the jaw area during TBI, tell the nurse so pain relief can be ordered. Swelling of the salivary glands causes this pain. It may hurt to open the mouth. This sometimes happens after the first TBI treatment and then goes away within a few days.
- Your child cannot wear any jewellery or contact lenses during TBI, although they may be worn between treatments.
- Do not use any hot blow dryers on the skin or scalp.
- Your child will be sensitive to sunlight, and his/her skin will burn more easily in the future. Your child will always need to use a sunscreen and wear a hat when going outdoors.

The afternoon before starting TBI, your child will be admitted to the radiation hospital and will stay as an inpatient during TBI. One parent/family member will be able to stay overnight in the same room. The staff at the radiotherapy unit will show you these facilities on your first visit.

What to bring

For admission to the ward please bring your child's:

- toiletries
- nappies (if required)
- bottles and formula (if required)
- favourite music CD or DVD (to play during the radiation treatments)
- comfort items
- comfortable change of clothes.

What is TBI like?

Your child will not feel any pain or anything unusual during TBI. Your child will be asked to lie on his/her back for the first treatment and then on their side for the second treatment on a bed made just for this treatment.

Therapists will rest a jelly-like material onto the body and make sure the radiation is delivered as prescribed.

The machine makes a humming sound during the treatment. While receiving TBI, your child needs to relax, be as still as possible, and breathe normally.

Your child will be alone in the room during the TBI, but the therapists will be watching your child on the TV monitor and can always hear your child. You will need to wait in the waiting room during treatment, so the staff can concentrate on your child and the treatment. However, you may be able to watch your child in the waiting room via a camera in the radiation room if your health service has this available. The most popular distraction method is for your child to watch a DVD while they have radiotherapy.

After each TBI treatment, your child will be taken back to their hospital room. There is no radiation in your child's body after the machine is turned off, and your child is not radioactive.



What are the side effects of TBI?

Your child may have one or more of the side effects listed below. The doctor will discuss these with you and your child. Most of the short-term side effects will go away after treatment in the days after TBI finishes. Your child will be given some medicine to help with the short-term side effects.

Side effects are referred to as 'early' or 'late' depending on when they occur in relation to the treatment. Side effects relating to chemotherapy are provided in more detail in the medication leaflets.

Early side effects

Early side effects are those that occur shortly after the start of TBI up to six months after TBI ends. They can include:

- nausea and vomiting
- sores in the mouth
- diarrhoea (upset stomach)
- jaw pain or swollen salivary glands
- dry mouth
- skin redness
- hair loss
- fatigue
- low blood counts
- sore throat, problems swallowing, or both.

Late side effects

Late side effects are those that occur six months to several years after the TBI treatment. They can include:

- cataracts
- decrease in growth
- hormone problems
- infertility
- secondary cancers.

Most of the short-term side effects will go away after treatment in the days after TBI finishes.