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 a conditioning regimen. Chemotherapy and TBI are used to prepare the body for new and healthy stem cells. This conditioning regimen also kills any remaining cancer cells. Your child may have TBI before or after the chemotherapy portion of the conditioning regimen.

**What is TBI?**

Radiation therapy uses high-energy waves, like X-rays. But the waves used in radiation therapy are stronger. TBI is radiation therapy that is given to the whole body. TBI is used to kill cancer cells that may be in places the 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. TBI is usually given 2 times a day with the second round of TBI given about 6 hours after the first. TBI can be given over 1–4 days in a row, depending on the protocol.

Your child’s TBI treatment will begin on ________________________________ (day and date).

**Getting ready for TBI**

During the pre-transplant evaluation (about a week before your child receives TBI), you will go to Radiation Oncology. During this visit, you and your child will meet doctors, nurses, and radiation therapists (the people who will give the TBI treatments). This is a simulation visit and will take about 2 hours. The staff will show you and your child how the TBI is given.

The staff will take X-rays so that lead blocks can be made to protect the lungs during TBI. The blocks are shaped like the lungs and are placed over the chest during the treatment. The blocks will not cause your child to have trouble breathing. The staff will take an X-ray called a port film before the radiation treatment begins to make sure the lung blocks are in the right place.

During this first visit, the doctor will discuss the side effects of TBI. You will be asked to sign a consent form. If you have any questions, please ask.

The simulation visit is scheduled for ________________________________ (day and date).
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 back and to turn his head to the side on a bed made just for this treatment. The bed will turn to one side when the TBI begins. On top of the bed your child will lay on a bag that looks like a beanbag. A vacuum will be attached to the bag to suck out the air. The bag will then conform to your child’s shape and will help hold your child securely in place when the bed turns.

On the first treatment day, the radiation therapists may draw an outline of your child’s lungs on his back with a marking pen. Do not wash these marks off until the last TBI treatment is complete. 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. Please bring your child’s favorite music CD or tape to play during the radiation treatments. A CD and tape player are provided.

After 1 side of the body is treated, the bed will turn and the other side of the body will be treated. It takes about 20 minutes to treat each side of the body. Your child will be alone in the room while receiving TBI, but the therapist and nurse will be watching your child on the TV monitor and can always hear your child. You may watch your child’s first treatment. You will need to wait in the waiting room for the other treatments, so the staff can better concentrate on your child and the treatment.

After each TBI treatment, your child will be taken back to his 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. It is hard to know whether a side effect is caused by the chemotherapy or the radiation. Most of the side effects go away after treatment. Your child will be given medicine to help with some of the side effects. Side effects are referred to as “early” or “late”, depending on when they occur in relation to the treatment.

**Early side effects**

Early side effects are those that occur shortly after the start of TBI up to 6 months after TBI ends. They can include:

- Nausea and vomiting;
- Sores in the mouth;
- Diarrhea (upset stomach);
- Jaw pain or swollen salivary glands;
- Dry mouth;
- Skin redness;
- Hair loss;
- Fatigue;
- Low blood counts; and
- Sore throat, problems swallowing, or both.

**Late side effects**

Late side effects are those that occur 6 months to several years after the TBI treatment. They can include:

- Cataracts;
- Decrease in growth;
- Hormone problems; and
- Sterility.

**Taking care of your child during TBI**

- Keep following your child’s mouth care program. Keeping the mouth clean helps any sores heal.
- Give medicines prescribed by the doctor to prevent or stop nausea.
- Do not use any oil-based lotions on the 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 choice of lotions to keep the skin soft and moist.
Total body irradiation before stem cell transplant

- Only use mild soaps, such as Dove® or Ivory®. 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 medicine 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 jewelry 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 skin will burn more easily in the future. Your child will always need to use a sunscreen lotion with an SPF (“sun protection factor”) of 15 or higher for the rest of his life.

If you have questions or concerns about TBI, call 595-3300 and ask to speak to a doctor or nurse in Radiation Oncology. If you are outside the Memphis area, dial toll-free 1-866-2STJUDE (1-866-278-5833) and press 0 after the call connects.