

## RADIOTHERAPY

*This sheet is for your information and is not a substitute for medical advice. The specifics of your condition and treatment should be discussed with your oncologist to establish the optimal treatment plan for you as an individual.*

### What is radiotherapy?

Radiotherapy (also known as radiation or x-ray therapy) is a cancer treatment that uses high energy x-ray beams to deposit energy into the cells in the treatment area. This causes cell damage and kills the cancer cells.

Normal cells are also influenced by radiation. In contrast to cancer cells, most normal cells recover from the effect of radiation. However, normal tissue still needs to be protected from radiation as far as possible. The total dose of radiation is thus limited to the dosage normal tissue can tolerate. Another precaution is to give radiation treatment over a varying period of time and to limit body exposure.

Every patient's treatment is planned by a radiotherapist with the assistance of computer technology. Normal tissue is protected from radiation beams where possible through the use of alloy shielding blocks.

### Aims and benefits associated with radiotherapy

The aim of radiotherapy is to destroy cancer cells with as little damage to normal cells as possible. Radiotherapy may be used in the treatment of different kinds of cancer in nearly any part of the body.

Radiation, like surgery, is a local treatment, i.e. therapy that makes an impact on the immediate area to which it is applied. It therefore influences the tissue in the specific area of the body that is being treated.

Radiation is often used in combination with surgery to treat cancer. Doctors may give radiation before surgery to shrink a cancer mass, which may enable them to remove all the cancer tissue without using extensive surgical methods. Radiotherapy may also be given after surgery to lessen the chances of regrowth of any remaining cancer cells.

In some cases radiation is used in combination with chemotherapy. The radiation may be given before, during or after chemotherapy. Combination therapy is tailored carefully to suit each individual patient's needs according to the type of cancer, its location and the stage of development of the condition.

When curing the cancer isn't a realistic option anymore, radiation is often used to shrink cancer masses. In doing so, pressure, pain and other symptoms associated with uncontrolled cancer growth are relieved. This treatment is known as palliation or symptom relief. Most cancer patients with problematic symptoms find that they may lead a better quality of life after radiation.

### How is radiotherapy administered?

Radiation may be given either externally or internally. The treatment you will receive depends on the type and stage of development of the condition, as well as its location.

Most people who receive radiation therapy for cancer get **external beam radiation**. The beams are created in a machine called a linear accelerator. The machine directs the high energy x-rays at the cancer, treating it and a small margin of normal tissue around the edges.

When **internal radiation therapy** is used, the radiation source is placed inside the body. This method of radiation is called brachithery.

Some patients have both forms of radiation, one after the other. Others receive one or the other.

### **What does 'treatment planning' mean?**

Before starting with the actual radiotherapy treatment, the precise location of the area to be treated must be determined because:

- it is necessary to ensure that your body is kept in the same position every day when receiving treatment
- the radiation must be planned for you as an individual so that the maximum amount of radiation to the cancer mass is delivered, while a minimal dose reaches normal, surrounding tissue.

You will be asked to lie very still on a treatment couch while the radiotherapist uses a linear accelerator to define your treatment fields. Depending on the location of your cancer, one or more treatment fields may be necessary. The planning process may also involve a computed tomography (CT) scan of the affected area to plan radiation fields more accurately. After completion of the CT scan it may take another few days to develop a final treatment plan, a process during which different combinations and options are considered to determine the best possible treatment plan for every individual patient.

Masks or other immobilising devices may be used to prevent any movement during treatment. Again, these devices are used differently with each individual, depending on the needs of the patient. They will also be used every time treatment is performed to ensure correct treatment setup.

Small tattoos in the form of pin-pointed dots will be placed under the surface of your skin to define the treatment area. This is to ensure that treatment is delivered to exactly the same area every day. The tattoos also enable one to determine areas where radiation has been delivered previously, even years after the last treatment. Non-permanent pen marks will also be used to ease daily setup and after the treatment field has been determined. These pen marks must not be washed off.

Before your first treatment, a set of special x-rays will be taken. This is again to confirm that the radiation will be delivered to the correct area. It also serves as a record of your treatment. These x-rays will be repeated during the course of radiotherapy.

### **How long does treatment last?**

Most cancers are treated with radiotherapy for five days per week over a six to seven-week period. (When radiation is given for symptom control only, shorter treatment periods are used; usually two to three weeks.) Every treatment lasts 10 to 20 minutes. The actual radiation therapy takes only a few minutes. Setting you up in the correct position accounts for the remainder of the time.

The use of smaller daily doses of radiation given over a longer period of time, instead of a few large doses over a shorter time period, helps to protect normal tissue that may surround the treatment area. Rest periods over weekends also help normal cells to recover from radiotherapy. Treatments are therefore scheduled for every day except on a Saturday and Sunday. This fits in with a normal working week and also leaves time for tissue repair.

### **What happens during radiation treatments?**

Remember to wear clothes that are easy to take off and put on when you go for treatment.

The radiotherapist will use the marks on your skin to position you correctly and to determine the **treatment field**. You will be asked to lie very still on the treatment couch and, although you will be alone in the room during the treatment, continuous monitoring through a closed circuit camera and intercom system will be done.

External beam radiation is painless and comparable to x-rays taken for diagnostic purposes. You will not hear, see or smell the radiation. The radiation will also not make your body radioactive. After starting treatment, your doctor will see you at least once a week to monitor your treatment progress, as well as your body's reaction to the treatment.

**References**

GVI Oncology (South Africa). Website: <http://www.cancercare.co.za>