

Cancer treatments - radiotherapy

Radiotherapy is the use of precisely targeted x-rays to destroy cancer cells. Normal cells can recover from radiotherapy. The length of treatment varies depending on individual factors such as the location, type and stage of the cancer, and whether or not the radiotherapy is combined with other treatments such as chemotherapy or surgery. Radiotherapy can cure cancer in many sites of the body.

Treatment decisions are made by a specialist team

Before a decision is made about whether radiotherapy is appropriate for your condition, your case is discussed in a multidisciplinary meeting. At this meeting, representatives of all the medical specialities involved in care of your specific type of cancer are present. This includes:

- Specialised surgeons
- Medical oncologists
- Radiation oncologists
- Pathology specialists
- Radiology specialist.

Medical staff at these meetings look at all the information relating to your case; this may include information about your lifestyle and the results of various tests. They then offer specialist advice about the best way to treat your type of cancer.

Treatment length varies

Depending on the purpose of the treatment, some patients receive only one treatment of radiotherapy; others may receive regular treatments for one to seven weeks. It is usually (but not always) given once a day, five times a week and takes a few minutes each time.

Radiotherapy can be administered by a variety of machines and devices, depending on which body part is affected and the type and stage of the tumour. The two main types of radiotherapy are external and internal (brachytherapy).

Most external beam radiotherapy is given from a machine known as a linear accelerator. Most patients will have only one type of therapy. Some will need both depending on the site and type of cancer.

Different uses of radiotherapy

Depending on individual factors such as the location, type and stage of the cancer and the patient's age and general health, radiotherapy may be used:

- As the only treatment
- Together with chemotherapy
- Before surgery to shrink the tumour
- After surgery to kill off any remaining cancer cells
- As a method of pain relief and to ease symptoms such as bleeding.

External radiotherapy

External radiotherapy is administered in hospital by a team of medical professionals including the radiation oncologist (a medical cancer specialist) and the radiation therapist (a specially trained technician). Before treatment begins, the precise area to be targeted must be identified using a special x-ray machine called a simulator. CT, MRI and PET scans may also be required.

Your individual treatment plan (including the radiation dose and the precise area to be targeted) is prescribed by your radiation oncologist. It is calculated by the radiation therapist based on information from the simulator and CT, MRI or PET scans.

If you are to have treatment to the head or neck, the doctors may decide to make an individualised cast of your upper body. The cast will be worn during treatment to make sure you don't move your head.

In other cases, snug-fitting devices will be placed around your body during treatment to keep you stable. Some treatments require that you lie face down in a special cradle or on a belly-board, which allows part of the bowel to be outside the treatment area.

The doctor may mark the treatment areas on your body with non-permanent ink. These marks help the technicians to precisely align the radiotherapy equipment. You may be given special medicine (contrast) to identify internal organs and structures.

After the ideal position for treatment is determined, the radiation therapist may mark certain points on the skin with a tiny, permanent skin mark to make sure your daily treatments are accurately delivered.

External radiotherapy treatment – what to expect

Undergoing external radiotherapy is similar to undergoing a regular x-ray examination. There is no need for anaesthesia (except for infants). Usually no medication is needed before treatment; however, some treatments can make you feel nauseous or cause you to vomit. You may be given medication to prevent this before each treatment.

The machine that delivers the high energy x-rays is called a 'megavoltage machine' or a 'linear accelerator'. This is what will happen when you receive radiotherapy:

- You lie down on the treatment table beneath the machine.
- Radiation therapists position your body to make sure the treatment will precisely target the tumour. They use the information from your simulation procedure to do this accurately and follow the prescription from your radiation oncology specialist.
- Blocking devices, called shielding, protect the areas of your body that don't require treatment. These are attached to, or inside, the linear accelerator.
- Staff will leave the treatment room to operate the machine, but you can talk to them via intercom. They can also see you on a television monitor.
- Treatment takes a few minutes and is painless. You will hear a drone similar to that of a vacuum cleaner while the linear accelerator delivers the treatment.
- The staff may reposition the machine to give further treatment from different positions.
- Staff may take a film or computer-based picture of your treatment to show to your radiation oncologist. This confirms the accuracy of your treatment and allows for any minor adjustments in position due to body movements. Your doctor will not be able to tell about your progress from these pictures.

External radiotherapy doesn't make you radioactive. As soon as the machine is off, there is no radiation in you or the room. You may come into contact with anyone outside with no concern for their health or safety. Sometimes, the doctor will recommend both external and internal radiotherapy depending on your cancer.

Internal radiotherapy (brachytherapy)

Internal radiotherapy (also called brachytherapy – from the Greek words meaning 'treatment from a short distance') is given from a localised implant. The procedure is generally as follows:

- Hollow tubes of different shapes, or hollow needles, are put inside your body through or around the tumour.
- A precisely controlled computerised machine places a source of radiation inside these tubes or needles.
- The time the radiation source is left in varies. It depends on the strength of the source and the dose required.
- Treatments may be single or may need to be repeated a number of times depending on the situation.

Brachytherapy is commonly used to treat cancer of the cervix, uterus, vagina or prostate gland. It may also be used for other types of cancer.

Internal therapy uses slow and fast types of radiation

Two types of radiation sources are available. One works slowly over a number of days (low dose-rate) such as seed implants. The other type works very quickly and only takes minutes to give the treatment (high dose-rate).

Most treatments are given using high dose-rate sources. This may require between one and five treatments on separate occasions.

Implant sizes and shapes vary

Implants come in different sizes and shapes including needles, plastic tubes, catheters, capsules and rods depending on the type of cancer and the area of the body to be treated.

Some implants can be placed in already existing spaces inside the body (called intra-cavitary implants) and others are placed through the skin near the cancer (interstitial implant).

Implants can be temporary or permanent

The implant chosen for you is inserted into your body under anaesthetic. Brachytherapy implants can be temporary or permanent.

Temporary implants

A temporary implant is removed after treatment is given. It may need to be re-inserted each time, or may be left in place for a few days to allow treatments to be completed before removal. This will depend on the nature of the treatment.

While the radiation source is inside the needles or tubing, your body will emit small traces of radioactive energy. Once the source is withdrawn, even if the implant is in place, there is no radiation left in your body.

While you are being treated in the brachytherapy room or suite (which may be in an operating theatre), staff will be in a shielded room observing you closely. They can start and stop the treatment as required.

Most treatments take a few minutes and there is no sensation from the actual treatment. After the implant is removed, it is unusual to have any symptoms. If needles have been used, there may be some swelling. Bleeding and infection are very rare but may occur and require medical care.

If you are being treated in a hospital using low dose-rate radiotherapy, the source of radiation may be left inside the tubing for up to 40 hours and you will be isolated from staff and other people. This type of treatment is uncommon nowadays.

Permanent implant

A permanent implant is usually performed using radiation seeds (especially for prostate cancer). These implants stay in place. The therapy is given over days and weeks, but the seeds become weaker and eventually stop being radioactive after some months, depending on the variety of implant used.

The hospital staff will isolate you in a single room and limit the time you spend with visitors (especially children and pregnant women) in the first few days after the implant is inserted.

The radiation fades with time, so other people will be safe to be near you once you are discharged from hospital. Special instructions will be given about coming close to children and pregnant women while the sources are still active inside the body.

Common side effects during treatment

Not every patient experiences side effects. Usually, one or two side effects occur. Side effects depend on the type and dose of radiotherapy you receive and which part of your body is being treated. It is important to discuss side effects with your doctor because treatments are available. General side effects may include:

- **Fatigue**
- **Nausea**
- **Loss of appetite**
- **Skin changes** – including dryness, reddening, itching, blistering, flaking, tanning and superficial ulceration (which will heal in two to six weeks). Heat, sunlight, harsh soaps, chemicals, dyes and abrasive washing may make skin symptoms worse. Your radiotherapy nurse will discuss skincare with you. You may need special gels, creams and dressings.
- **Hair loss (alopecia)** – this may affect parts of the body that were treated, including head, facial hair, armpits and pubic hair.
- **Mouth issues** – may include mouth dryness, difficulty chewing and swallowing, and dental decay. You may need to see a specialist dentist prior to treatment to prevent future dental problems.

- **Chest problems** – may include coughing, shortness of breath and painful swallowing.
- **Abdominal problems** – may include diarrhoea, bleeding (rarely), a burning sensation when urinating, the urge to urinate more often, vaginal dryness and discomfort. If the ovaries are present and working, they may cease to work after four weeks and menopause may affect women. Patients with prior bowel disorders such as diverticular disease may find their symptoms become worse.

After treatment is complete, almost all of these side effects will disappear. Some may return after months or years and may affect other tissues in the treatment area. Please discuss this with your specialist.

Coping with side effects

It is important to remember that almost all side effects will disappear once treatment is completed. In the meantime, helpful strategies include:

- Rest as much as you can. Plan your activities for times when you know you'll feel the most energetic, perhaps in the mornings. Take afternoon naps if necessary.
- Exercise gently whenever possible.
- Avoid sun exposure. When outside, wear protective clothing such as a broad-brimmed hat and a long-sleeved top. Ask your doctor if it is okay to use a sun-block lotion on exposed skin.
- Avoid using perfumes, deodorants, soaps, creams and make-up. Use a soap-free wash instead.
- Avoid scratchy or stiff clothing.
- Avoid hot showers or baths, scratchy towels and shaving. Do not scrub dry the skin over the treatment area.
- Use gentle shampoos and avoid harsh hair treatments such as dyes, perms, hair rollers, gels and sprays if you are having radiotherapy to the head – which can cause hair loss.
- Try satin or cotton pillowcases – they may feel more comfortable against your scalp.
- Choose high-energy foods. If you don't feel like eating, opt for supplemented drinks such as milkshakes with egg, honey or supplement powders.
- Avoid high-fibre foods if you are having radiotherapy to the abdomen as this treatment can cause nausea and diarrhoea. Choose bland foods such as toast or dry biscuits. Specific medication may be required. Avoid spicy food and food with seeds.
- Try to snack lightly throughout the day rather than having three main meals.
- Avoid over-the-counter mouthwashes, alcohol and cigarettes if you are having radiotherapy to the head or neck, as this treatment can cause swallowing problems and a dry mouth. Your doctor may prescribe artificial saliva products. A speech therapist may assess swallowing and speech difficulties if necessary. Avoid food and drink that is too hot or too cold.
- Visit your dentist before, during and after radiotherapy to best manage dental problems such as decay.
- Avoid over-the-counter drugs, natural therapies or any other type of supplement unless your doctor says that it is okay to take them.
- Use a vaginal cylinder and hormone cream. This may help women receiving pelvic radiotherapy for cancer of the cervix, uterus, bladder, bowel or other pelvic area. This will prevent narrowing and drying of the vaginal lining. Your sexual function may be affected and can be discussed with your doctor or nurse. Referral to the gynaecology unit may be helpful. Fertility and hormonal function may also be affected and should be discussed with your specialists.
- Discuss fertility and sexual function with your specialist, as they may be affected by radiotherapy given to the pelvic area in men.
- Treat the burning sensation when urinating, or the urge to urinate more often – a common side effect of radiotherapy to the bladder region – by reducing acid in the urine. You can do this with medication but if you have ongoing or severe symptoms discuss them with your doctor.
- Seek help if you feel depressed or anxious. See your doctor for advice and referral if talking about your feelings with family and friends doesn't make you feel any better.

Regular tests

During treatment, your doctor will order medical tests such as physical examinations, x-rays, other scans and blood tests to find out how you are tolerating the treatment. During therapy it can be hard to tell how well the radiotherapy is working. This will be assessed after your course of treatment is completed.

Report to your doctor

You should notify your doctor at once if you experience severe or distressing side effects that do not respond to medication provided, such as severe vomiting, chronic diarrhoea, bleeding or some other change in your health that worries you. If you can't contact your doctor, go to the emergency department of your nearest hospital. Tell the staff that you are having radiotherapy.

Where to get help

- Your doctor at the treatment centre
- Your Unit Nurse Specialist
- The Cancer Helpline Tel. 131 120
- Peter MacCallum Cancer Centre Tel. (03) 9656 1111 or (03) 9656 1918
- Palliative Care Victoria Tel. (03) 9662 9644

Things to remember

- Radiotherapy is the use of precisely targeted x-rays to destroy cancer cells. It is a painless treatment given in a number of doses.
- Common side effects of radiotherapy include fatigue and skin problems such as itchiness and colour changes.
- It is important to remember that almost all side effects will disappear once treatment is completed.
- Later effects will need to be monitored along with your progress.

This page has been produced in consultation with, and approved by:

Peter MacCallum Cancer Centre

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