What is radiotherapy?
Radiotherapy uses invisible high energy x-rays and similar rays (such as electrons) to treat cancer. It works by destroying cancer cells in the area that’s treated. Although normal cells can also be damaged by radiotherapy, they can usually repair themselves. Radiotherapy is given using equipment similar to a large x-ray machine.

What is IMRT?
IMRT is a specialised way of giving radiotherapy. It is able to shape radiotherapy beams to fit the outline of the tumour more precisely. It can also give treatment from many different angles.

IMRT can allow different doses of radiotherapy to be given to different parts
of the area being treated. This means lower doses can be given to the healthy tissue surrounding the tumour.

In some people, radiotherapy can cause damage to healthy tissue, which could cause long-term side effects some years after treatment (also known as late effects). IMRT reduces the risk of damage to the healthy tissue surrounding the tumour, and so it may reduce the risk of long-term side effects.

When IMRT is used
IMRT is not widely available in the UK and you may have to travel to a specialist centre to have it. It’s currently used to treat cancer in many different parts of the body, including prostate, breast, and head and neck cancers, as well as some types of brain tumours.

Because IMRT can reduce the risk of damaging healthy tissue near the cancer, it’s sometimes used in situations where the tumour is very close to important organs or structures. IMRT may not be suitable for everyone. Your doctor will be able to discuss with you whether IMRT might help in your situation.

Radiotherapy staff
At the radiotherapy department, you may meet various members of staff before, during and after your treatment, each with a different role. A clinical oncologist, sometimes called a cancer specialist, is a doctor trained in the use of radiotherapy and chemotherapy. Radiographers will work closely with your oncologist to plan and carry out your radiotherapy treatment. Many cancer centres also have specialist cancer nurses, sometimes called clinical nurse specialists, who have expert knowledge about your type of cancer. They can be a good source of support and information during your treatment.

How it's given
Treatment planning
IMRT has to be carefully planned to make sure it works as well as possible. You will usually have a CT scan and sometimes an MRI scan to take 3D pictures of the area to be treated. This helps doctors and radiographers identify the exact shape and location of the tumour. Treatment planning is a very important part of radiotherapy, and it may take a couple of visits.

Tiny ‘tattoos’ or permanent marks may be drawn on your skin. These show where the radiotherapy is to be given, and help the radiographers position you accurately when they give you your treatment. The marks are usually permanent because they must remain visible throughout your treatment, but they are the size of pinpoints and will only be done with your permission. Having the tattoo done can be a little uncomfortable, but it can help to make sure that treatment is directed accurately. You’ll be given advice about how to look after your skin during this time.

If you’re having radiotherapy treatment (including IMRT) for cancer in the head and neck area, you may be asked to wear a plastic mask (sometimes known as a shell or mould) for a short time while you’re having the treatment. This helps keep your head in the same position while the radiotherapy is being given. It also helps to avoid giving radiotherapy to parts of the head and neck that don’t need treatment. In this situation, tattoos are not necessary, as marks will be drawn on the mask, not on your face or neck.

The mask is made in the mould room of the radiotherapy department by a mould technician or radiographer. The process can vary slightly between hospitals, but it usually takes about 30 minutes. One technique uses wet plaster bandages to take an impression of your face, with the finished mask being made of perspex. The other technique uses a type of mesh plastic, which is moulded to fit the shape of your face.
**Treatment sessions**
The radiographer will help to position you on the treatment table. You'll have to lie in the same position for a while, which could get uncomfortable. Otherwise, IMRT is painless. Treatment sessions usually last about 10–30 minutes. The number of treatment sessions you have will depend on your type of cancer. They are usually given Monday–Friday for 5–10 weeks. Your specialist doctor or nurse will be able to discuss this with you.

**Possible side effects**
Some people have very few side effects, while others may experience more. The side effects described here won't affect everyone who has IMRT and may be different if you're having (or have had) other types of treatment.

We've outlined the most common side effects but haven't included those that are rare and therefore unlikely to affect you. If you notice any effects which aren't listed here, let your specialist doctor or nurse know.

Because IMRT reduces the dose of radiotherapy given to healthy tissue, it's possible for the side effects to be very mild for some people.

**Tiredness** You may find that you feel tired during IMRT. This may get worse as you go through treatment, but should improve during the weeks after it finishes. Pay attention to how you feel and, if necessary, allow yourself extra time to rest, perhaps by taking naps.

**Skin reactions** Some people may find they get a skin reaction like mild sunburn on the area being treated. You'll be given advice on how to look after your skin by the radiographer.

Other possible side effects will depend on the part of the body being treated but can include:
- pain or swelling in the area being treated
- hair loss in the area being treated
- bowel or bladder problems, such as needing to go to the toilet frequently
- difficulty swallowing and eating
- dry mouth and mouth problems, such as ulcers
- coughing
- headaches
- nausea and vomiting.

You will only experience side effects in the area of the body being treated. For example, if you're having radiotherapy to the pelvic area, you might lose some pubic hair but wouldn't lose any hair on your head.

These side effects usually disappear gradually over a few weeks after treatment has finished, although for some people it may take longer. It's important to discuss any side effects with staff at the radiotherapy department. Your doctor, specialist nurse or radiographer can give advice and support to help you manage any side effects.

**Possible long-term side effects**
Unfortunately, radiotherapy treatments (including IMRT) can cause longer-term side effects. These may not appear until some months or years after treatment has ended, and for some people they can be permanent.

We've given an outline of some long-term side effects here. These side effects also depend on which part of the body is being treated.

**Dry mouth** Some people find they can't produce as much saliva as before the treatment. The lining of the mouth and throat may become dry and this can make eating and speech difficult.

Sometimes radiotherapy makes saliva thick and stringy, so you may notice a sticky feeling in your throat, which can be distressing. To reduce the dry feeling, it's helpful to drink fluids regularly and to
use an artificial saliva spray. Wiping small amounts of vegetable or olive oil on the inside of your cheeks can also help. Talk to your doctor or specialist nurse if this becomes a problem, as they may be able to prescribe artificial saliva and mouthwashes to help.

**Bowel and bladder changes** After radiotherapy to the pelvic area, some people experience changes when going to the toilet. This may mean needing to pass urine or open your bowels more frequently, and having loose stools.

There's also a small risk of bleeding from the back passage or of blood in the urine. This happens because small blood vessels in the bowel or bladder become thin and fragile after radiotherapy. Other potential problems include needing to rush to the toilet urgently, or leakage from the bowel or bladder (incontinence). These problems can feel embarrassing or awkward to talk about, but your doctor or specialist nurse may be able to help if you discuss it with them.

**Lymphoedema** Radiotherapy can cause the area being treated to become swollen, known as lymphoedema, although this is uncommon. This mostly affects the legs or arms and can occur a few weeks or several years after radiotherapy.

Lymphoedema can occur when the lymph nodes have been removed by surgery or damaged by radiotherapy. Lymph nodes act as filters within the lymphatic system, helping to fight infection and disease. If the nodes have been removed or are damaged, the lymph fluid may be unable to pass along the vessels so excess fluid can build up. If you notice any changes, such as swelling around your legs, groin or any other part of your body, you should talk to your doctor about it.

**Sexual effects** Both men and women can experience physical and emotional changes to their sexuality after cancer treatment. Radiotherapy can affect a man's ability to have and maintain an erection, due to damage to the blood vessels and nerves in the pelvic area. In women, radiotherapy can cause inflammation to the walls of the vagina. This means that the vagina may become narrower or shorter, which can make sex uncomfortable.

Help and advice with these types of problems is available, but it can often be difficult to bring up the subject of sexuality in an appointment with your doctor or specialist nurse. Most healthcare professionals are used to dealing with this subject and should be able to answer any questions.

**Additional information**

**Fertility** Most radiotherapy treatment has no effect on your ability to have children unless the ovaries or testicles are in the treatment area. If you have concerns about your fertility, talk to your doctor or specialist nurse as they will be able to give you more information.

**Your feelings**

You may experience many emotions, including anxiety and fear. These are normal reactions and are part of the process many people go through in trying to come to terms with their condition.

Everybody has their own way of coping with difficult situations. Some people find it helps to talk to family or friends, while others prefer to seek help from people outside their situation, such as counsellors. Some people prefer to keep their feelings to themselves. There's no right or wrong way to feel, but help is available if you need it. If you'd like to discuss ways to get help with our cancer support specialists, call the Macmillan Support Line free on 0808 808 00 00, Monday–Friday, 9am–8pm.
Related Macmillan information

- Cancer treatment and fertility – information for men
- Cancer treatment and fertility – information for women
- How are you feeling?
- Making a radiotherapy mask
- Sexuality and cancer
- Understanding lymphoedema
- Understanding radiotherapy

For copies of this related information call free on 0808 808 00 00, or see it online at macmillan.org.uk

This fact sheet has been written and edited by Macmillan Cancer Support's Cancer Information Development team. It has been approved by our medical editor, Dr Terry Priestman, Consultant Clinical Oncologist.

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