



Advanced Radiotherapy

The information in this factsheet will help you to understand more about advanced radiotherapy treatments for cancer. It can be read along with the booklet *Understanding Radiotherapy*. The information here is an agreed view by medical experts. If you have any questions or concerns about these treatments, discuss them with your doctor, radiation therapist or call the National Cancer Helpline on freephone 1800 200 700.

Types of advanced treatments

The factsheet discusses the following radiotherapy treatments:

- Stereotactic radiotherapy
- Stereotactic radiosurgery
- Intracranial stereotactic radiotherapy or radiosurgery
- Extracranial stereotactic radiotherapy (stereotactic body radiotherapy)
- IMRT (intensity-modulated radiotherapy)
- IGRT (image-guided radiation therapy)
- Hyperfractionated radiotherapy
- Hypofractionated radiotherapy

Remember that these treatments are not suitable for everyone and are only available in some hospitals. This is because special equipment and skills are needed. Your doctor will tell you if any of these treatments are suitable for you and your cancer, and which sections of the factsheet are relevant to you.

Stereotactic radiotherapy uses smaller more precise radiation beams than standard radiotherapy. These give a higher dose to your tumour and less healthy tissue is affected.

What is stereotactic radiotherapy?

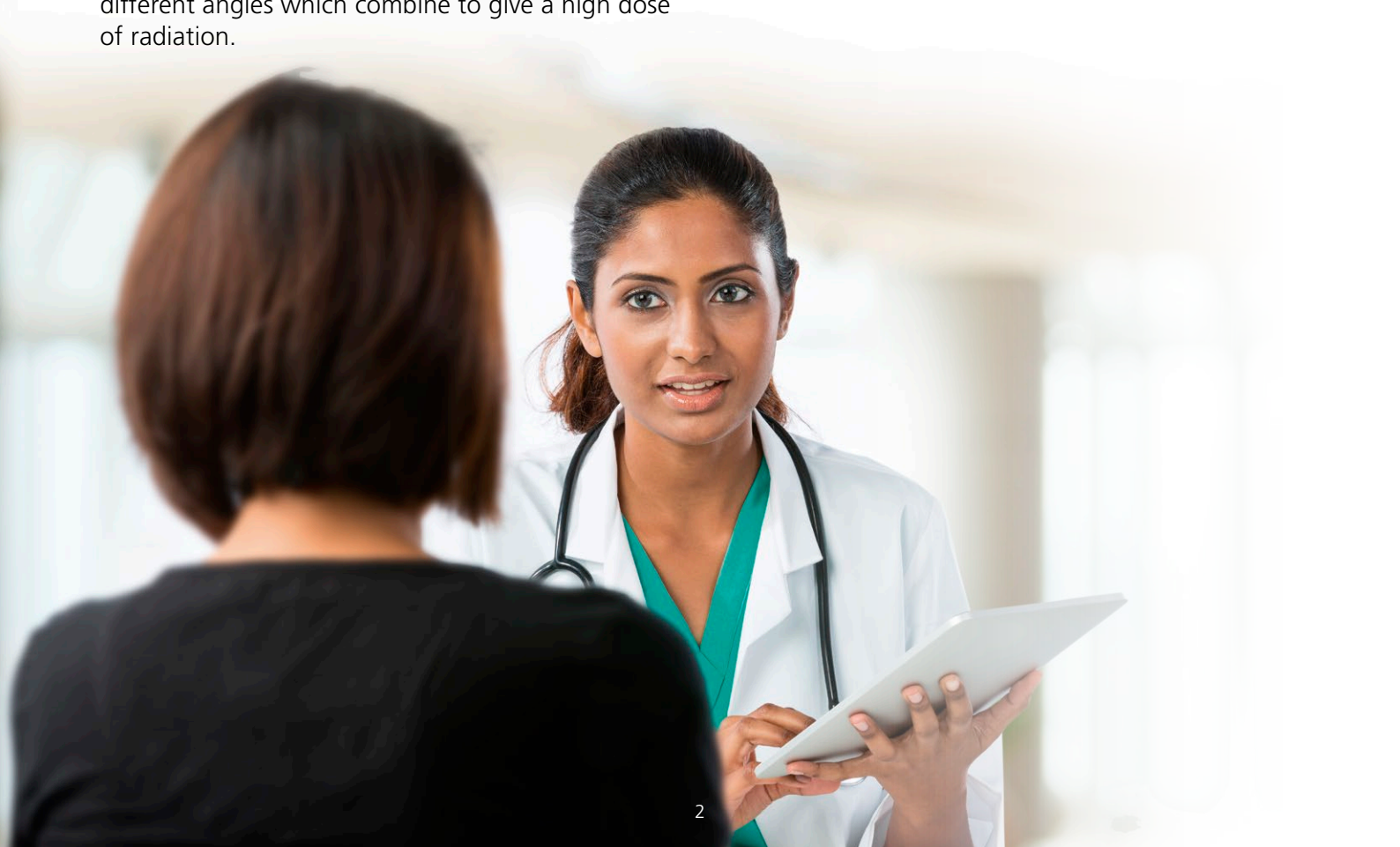
Stereotactic radiotherapy is a very technical and accurate way of giving radiation. The radiation beam is made by a machine called a linear accelerator and aimed directly at your tumour. Stereotactic radiotherapy uses smaller more precise radiation beams than standard radiotherapy. These beams are targeted at your tumour from several different angles which combine to give a high dose of radiation.

With stereotactic radiotherapy, less healthy tissue is affected compared to standard radiotherapy. As a result, it is less likely to cause side-effects. Another benefit is that you have less treatment sessions compared to standard radiotherapy. Your doctor will advise you if stereotactic radiotherapy is a treatment option for you or not.

What is stereotactic radiotherapy used for?

Stereotactic radiotherapy is generally used on small tumours that are not suitable for surgery, such as some brain or lung tumours. If stereotactic treatment is given to your brain, it is called intracranial stereotactic radiotherapy or radiosurgery.

If stereotactic radiotherapy is given to any part of your body but not your head, it is called extracranial stereotactic radiotherapy, or stereotactic body radiotherapy. It is most often used for treating small lung cancers, but other organs such as your liver can also be treated.



What is the difference between stereotactic radiotherapy and stereotactic radiosurgery?

Stereotactic radiosurgery is like stereotactic radiotherapy, except that it is given in just one dose (fraction). See page 5 for more information on stereotactic radiosurgery.

How is stereotactic radiotherapy planned?

In stereotactic radiotherapy, the radiation beams target your tumour in the same place every time and avoid nearby healthy tissue as much as possible. That is why it is so important you stay still during both the planning stage and during every treatment. Stereotactic radiotherapy planning is a slow process. You may need to visit the radiotherapy unit once or twice to complete it. You may need to wear a body mould, mask, dental mouth bite, or circular head frame. These are called immobilisation devices. The device will help keep you in the right position every time you have your treatment. Your radiation therapist or doctor will tell you if you need an immobilisation device for your treatment planning and for treatment itself. The treatment position can be awkward but do not worry as your radiation therapists will make you as comfortable as possible.

Like other types of radiotherapy, your doctor will use a CT scan to plan your treatment. This CT scan is done with you wearing the immobilisation device. The scan helps your doctor work out how to shape the radiotherapy beams so that they target your tumour accurately. After your CT scan, your doctor will outline the area that needs radiation. Then other radiotherapy staff and computers will plan your radiotherapy.

To help you stay still during your treatment, you may need to wear a body mould, mask, dental mouth bite or circular head frame.

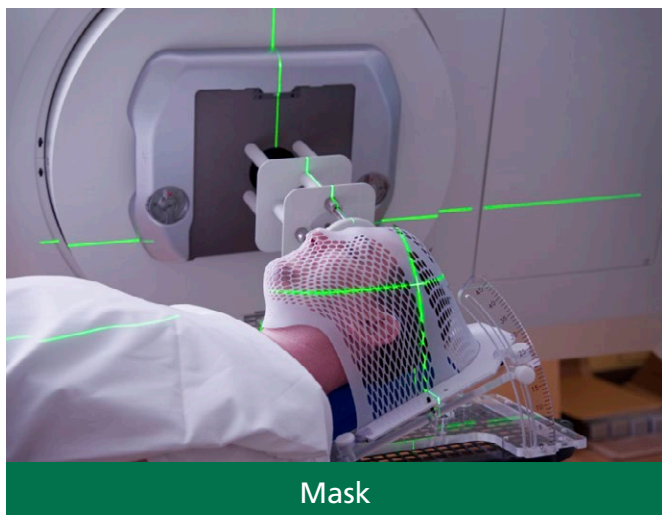


Body mould

Body moulds

A body mould is used for stereotactic radiotherapy to your body (extracranial). This makes sure that you are in the same position throughout your treatment. You will first be asked to lie down and hold your arms above your head. You then lie on a bag (like a bean bag) the length of your body. Next a vacuum will be attached to the bag and the air sucked out. This will make a mould around your body so that you are always in the same position for your planning and treatment. Using a body mould might make your planning process even slower but it is needed for your treatment.

If you are receiving stereotactic radiotherapy to your lung, your breathing may also be taken into account. Remember every time you breathe in and out, your lungs and chest move. This makes it more difficult for your doctor to make sure that the radiation is aimed directly at your tumour.

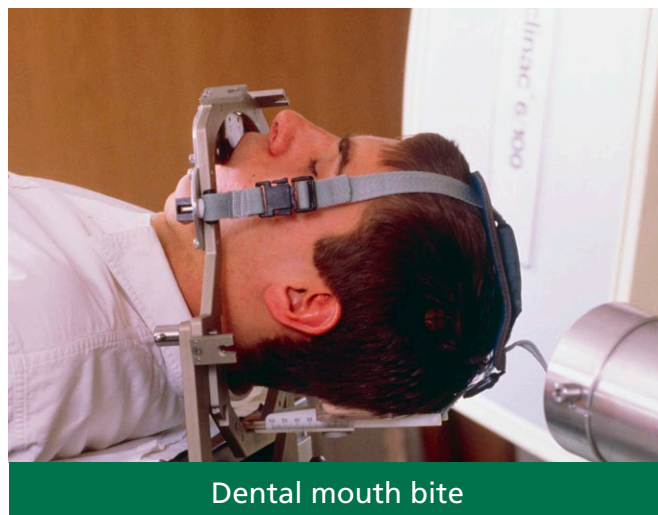


Head frames

Most patients receive stereotactic radiotherapy without a head frame. If you do need one, it will be customised to fit around your head. A head frame is used for intracranial stereotactic radiosurgery only. The circular metal frame is held in place by four attachments that line up with your skull. Two are in your forehead and two are at the back of your head. Your neurosurgeon (specialist doctor) will put your head frame on. You will feel some pressure at first but the treatment should not cause you pain, as an anaesthetic can numb your skin where the frame will be attached. But if you are uncomfortable, your doctor can inject more anaesthetic around the attachments to numb the area even more. Once your treatment is over, your doctor will remove your head frame.

Masks

The mask is made from plastic with a mesh appearance so that it is easy to breathe through. The plastic is first placed in warm water to make it soft and then draped carefully over your head. It will feel like having a warm face cloth placed over your face at first but it cools very quickly. The holes in the plastic will allow you to breathe easily through it. The therapists mould the plastic to the shape of your head as it cools.



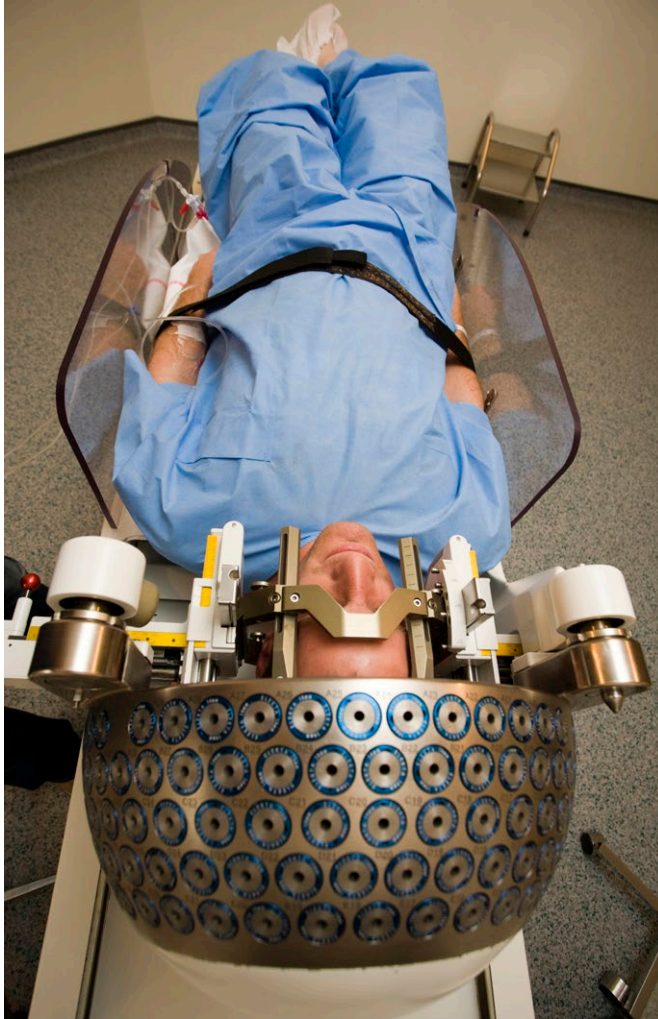
Dental mouth bite

To make a dental mouth bite, you will be asked to bite into a plastic mould full of putty. The mould is like a gum shield. The putty will dry in 10 minutes and make a mould of your upper teeth.

The radiation therapist will then attach a small frame to your mould. This helps to make sure that your radiotherapy is delivered accurately to your tumour. Your radiation therapist might ask you to remove your mouth bite a few times to check that it fits correctly.

How is stereotactic radiotherapy given?

Stereotactic radiotherapy is delivered by a machine called a linear accelerator. This is the same type of machine used for standard radiotherapy. Your doctor will tell you how many treatments (fractions) you need. Getting into the treatment position is very important and can take some time. During treatment the machine will move around you. As soon as each treatment is over you can go home. It is a good idea to have somebody to bring you home as you may be quite tired.

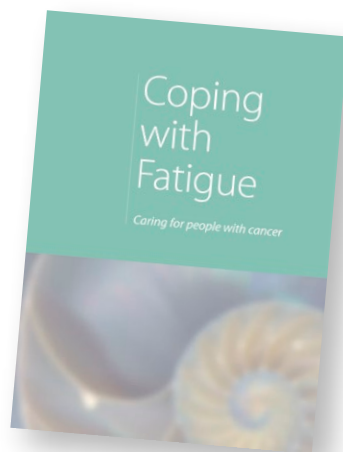


Head frame

What are the side-effects of stereotactic radiotherapy?

The side-effects of stereotactic radiotherapy depend on which part of your body is being treated. Stereotactic radiotherapy has less side-effects than other types of radiotherapy because less healthy tissue is exposed to radiation.

You might feel very tired (fatigued) after receiving stereotactic radiotherapy. But it is difficult to know beforehand how tired you will feel or when the tiredness will start. For more information on fatigue, contact the National Cancer Helpline on 1800 200 700 and ask for a free copy of our booklet, *Coping with Fatigue*.



If you are concerned about the side-effects of stereotactic radiotherapy, do talk to your doctor or radiation therapist.

There are two different types of stereotactic radiosurgery, frame-based and frameless.

What is stereotactic radiosurgery?

Stereotactic radiosurgery is like stereotactic radiotherapy, except that it is given in just one dose (fraction). It is used to treat tumours in your head (intracranial radiotherapy). Your doctor will tell you if it is suitable for you or not.

Like stereotactic radiotherapy, the radiation comes from many different angles. There are two different types of stereotactic radiosurgery. These are frame-based and frameless. Your doctor will tell you which one is suitable for you. You must remain still during your treatment so you will need to wear either a head frame or a mask and dental mouth bite.

Frame-based stereotactic radiosurgery

Stereotactic radiosurgery is a very accurate treatment so it is important that you remain still. A circular metal frame will keep your head very still while you are receiving your treatment.

A neurosurgeon will fit the frame on your head. To do this, an anaesthetic cream is first put on the front and back of your head. This will help to numb the areas where the frame will be attached. The frame has four attachments: two at the front and two at the back. When your doctor attaches these to your head, you will feel some pressure for a short while.

Do not worry if the frame is uncomfortable as your doctor can inject extra anaesthetic around the pins to numb the area even more. The head frame will stay on your head all day. Once your treatment is over, your doctor will remove the frame.

Frameless stereotactic radiosurgery

For this type of radiosurgery, you do not need to wear a head frame. But you will need to wear a mask.

A mask is used to help you remain in the same position throughout your planning CT scan and the radiosurgery. The mask is made from a warm, wet plastic material. The warmed plastic is draped carefully over your head. It will feel quite warm at first but cools very quickly and you can breathe easily through it. Your therapists mould the plastic to the shape of your head as it cools.

How is stereotactic radiosurgery planned?

The planning for both frame-based and frameless stereotactic radiosurgery is the same as for stereotactic radiotherapy, as described above. Remember planning can be a slow process. The first step is a CT scan. This scan will help your doctors to plan your treatment, making sure your radiation is aimed exactly at your tumour. This is done with your immobilisation device on. For example, your circular metal frame or dental mouth bite and head mask. After the CT scan, you can ask the therapists any questions you have about your radiosurgery.

How is stereotactic radiosurgery given?

On the day of your treatment, do bring a family member or friend with you to the hospital. They can also accompany you home afterwards. It helps to wear comfortable, loose-fitting clothes on the day.

The treatment might take place on the same day as the planning. Your radiation therapist will bring you to the treatment room and your head frame or head mask is put on. Your therapist will then help you to lie down in the correct position. You must remain in this position for your treatment, so if you are not comfortable, let the staff know. It will be the exact same position as for your CT planning scan.

While you are receiving your radiation, you will not feel anything. The treatment can take from 30 minutes to over an hour. Your therapists and doctor will watch you at all times on a closed circuit TV and listen to you on an intercom system, if you need to speak. You might like to bring a favourite CD, which can be played while you have your treatment, as it can help you to relax.

What are the side-effects of stereotactic radiosurgery?

You might get a headache or feel sick (nausea) after radiosurgery. If this happens, tell your doctor or therapist. They will advise you on what to do. It is normal to feel very tired after the treatment, so do have someone to bring you home. If possible, have someone stay with you that night in case you do not feel well. Your therapist will give you phone numbers to ring if you have any problems.

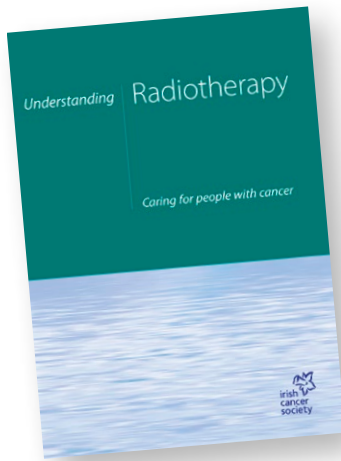
What follow-up do I need?

After treatment you will need a checkup visit to your specialist. This is known as follow-up. Before you go home, your doctor will advise you when your follow-up appointment will be. The follow-up will normally involve an appointment with your doctor and some tests and scans. If you have any problems in between visits, contact your doctor or radiation therapists.

What other advanced methods are available?

There are other advanced radiotherapy methods also available. Your doctor may mention them when discussing your radiotherapy. They include:

- Intensity-modulated radiation therapy (IMRT)
- Image-guided radiation therapy (IGRT)
- Hyperfractionated radiotherapy
- Hypofractionated radiotherapy



Remember it helps to read this factsheet with the *Understanding Radiotherapy* booklet. For a free copy, call the National Cancer Helpline on 1800 200 700.

Intensity-modulated radiation therapy (IMRT)

IMRT is a fairly new radiotherapy method. It can shape the radiotherapy beams so that different doses of radiotherapy can be delivered to different areas. For example, if you are having radiation to your throat for a throat cancer, you will receive a higher dose to your throat and a lower dose to your neck lymph nodes. These lymph nodes also need radiotherapy treatment but at a lower dose. IMRT also helps to reduce doses of radiation to normal healthy tissues compared to standard radiotherapy. Your doctor will tell you if IMRT is suitable for you or not.

One benefit of IMRT is that healthy tissue near your tumour receives less radiation, so you experience less side-effects.

Image-guided radiation therapy (IGRT)

IGRT is another term your doctor might use. This means that the radiotherapy allows for changes in your tumour's location. For example, if you are receiving radiotherapy to your lung, your tumour will move as you breathe in and out during your treatment.

To allow for this, images are taken of your body every time you have treatment. These images help your therapists to adjust your radiotherapy so that it is targeting the tumour. By constantly checking the size and location of your tumour, your doctors can make sure that your treatment is as accurate as possible.

Hyperfractionated radiotherapy

Hyperfractionated radiotherapy means giving radiotherapy in more treatments per day than normal. For example, you may have 2 treatments on one day, at least 6 hours apart. The amount of radiation given may be higher or the same as you would have with standard radiotherapy. Hyperfractionated radiotherapy is not a common type of radiotherapy treatment. Your doctor will let you know if it is suitable for you or not.

Hypofractionated radiotherapy

Hypofractionated radiotherapy means giving radiotherapy in larger doses over fewer appointments. For example stereotactic radiotherapy and radiosurgery. Your doctor will tell you if it is suitable for you or not.

CANCER INFORMATION FACTSHEET

Useful organisations

Healthtalkonline

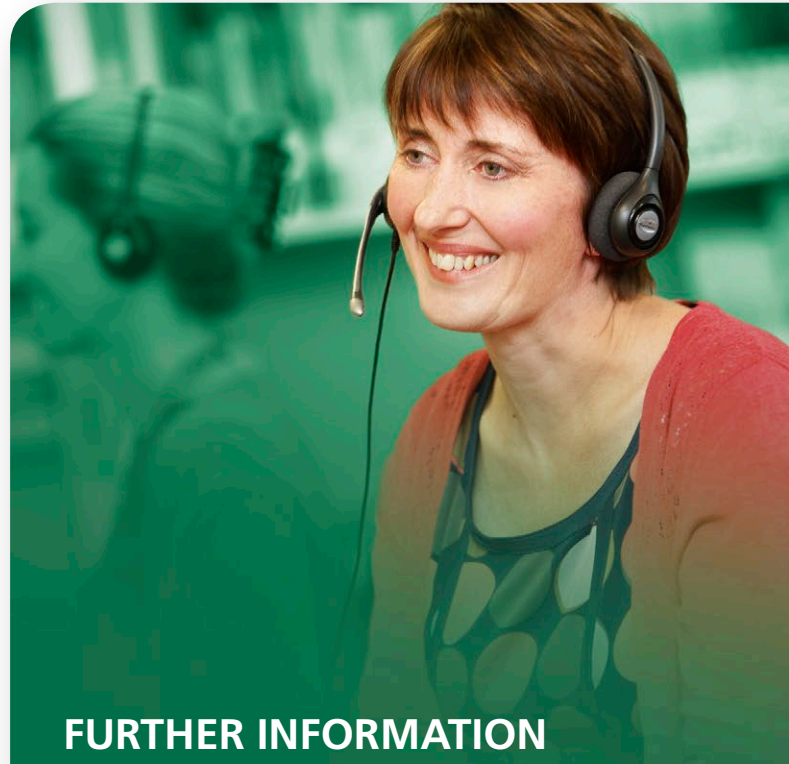
A website of patients' stories of illness and treatment.

Website: www.healthtalkonline.org

Useful booklets/DVDs

- Understanding Radiotherapy
- Coping with Fatigue
- Understanding Radiation Therapy: A Patient Pathway (DVD)

If you would like a free copy of these booklets or DVD, please call the National Cancer Helpline on Freefone 1800 200 700.



FURTHER INFORMATION

For more information on advanced radiotherapy or for confidential advice from our cancer nurse specialists, call the **National Cancer Helpline** on freefone

1800 200 700

(Monday–Thursday, 9am–7pm; Friday, 9am–5pm)
or email helpline@irishcancer.ie

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