

External beam radiotherapy

External beam radiotherapy involves directing high-energy X-ray beams at the prostate gland from outside the body. These beams damage the cells and stop them from dividing and growing. Cancer cells can't recover from this damage and die, but healthy cells can repair themselves more easily.

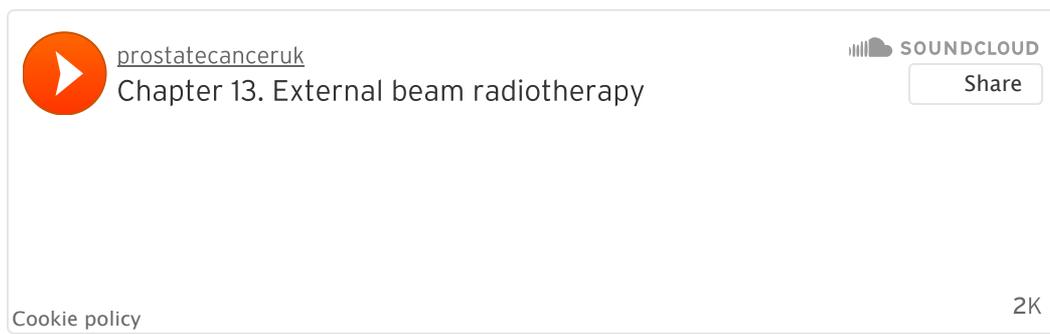
Radiotherapy treats the whole prostate, and sometimes the area around it. It aims to treat all the cancer cells, including any that have spread to the area just outside the prostate. The treatment is painless but it can cause side effects.

You may have radiotherapy to a wider area, including the nearby lymph nodes, if there is a risk that the cancer has spread there. Lymph nodes are part of your immune system and are found throughout your body. The lymph nodes in your pelvic area are a common place for prostate cancer to spread to. Because a larger area is treated, you might be more likely to get side effects.

Watch our video about external beam radiotherapy:

Watch [Ally's story](#) for one man's experience of radiotherapy treatment.

Listen to a summary of this page



The image shows a SoundCloud player interface. On the left is a red play button icon. To its right is the text 'prostatecanceruk' and 'Chapter 13. External beam radiotherapy'. In the top right corner, there is a SoundCloud logo and a 'Share' button. At the bottom left, it says 'Cookie policy' and at the bottom right, it shows '2K'.

Who can have radiotherapy?

External beam radiotherapy can be suitable for men with:

- cancer that hasn't spread outside the prostate – [localised prostate cancer](#)
- cancer that has spread to the area just outside the prostate – [locally advanced prostate cancer](#).

If your cancer has spread outside the prostate to other parts of the body ([advanced or metastatic prostate cancer](#)), you may be offered radiotherapy to help with symptoms such as bone pain. Radiotherapy can also help slow

the growth of the cancer. [Read more about radiotherapy for advanced prostate cancer.](#)

Radiotherapy might not be an option if you have bowel problems such as Crohn's disease or ulcerative colitis. Talk to your doctor or nurse about which treatments are suitable for you.

Radiotherapy for localised prostate cancer

If you're having radiotherapy for [localised prostate cancer](#) you might also have some [hormone therapy](#) for a few months before treatment. Hormone therapy shrinks the prostate and makes the cancer easier to treat. It can begin up to six months before your radiotherapy, and may continue during and after treatment. If your cancer is more likely to spread, you may continue to have hormone therapy for up to three years after radiotherapy.

If there's a risk that your cancer could spread outside the prostate, you might also be offered a type of internal radiotherapy called [high dose-rate brachytherapy](#) alongside your treatment. Having both types of radiotherapy together means you will get high doses of radiation to the whole prostate as well as to the area just outside it. This can help make the treatment more effective but it might also mean you're more likely to get side effects from treatment.

[Read more about other treatments for prostate cancer.](#)

Radiotherapy after other treatments for prostate cancer

Radiotherapy can be an option if your cancer has come back after [surgery](#) (called salvage or second-line radiotherapy). It may also be possible after [HIFU](#) or [cryotherapy](#). [Read more about treatment for cancer that has come back.](#)

Researchers are also looking at the benefits of giving radiotherapy very soon after [surgery](#) to men with a higher chance of their prostate cancer coming back. Giving radiotherapy immediately after surgery is called adjuvant radiotherapy.

Radiotherapy for locally advanced prostate cancer

External beam radiotherapy combined with [hormone therapy](#) is the standard treatment for men with [locally advanced prostate cancer](#). Your doctor might also offer you [high dose-rate brachytherapy](#) alongside radiotherapy and hormone therapy.

- [What are the advantages and disadvantages?](#)
- [What does treatment involve?](#)
- [What happens next?](#)
- [More information](#)
- [About us](#)

This fact sheet is for men who have been offered external beam radiotherapy to treat their prostate cancer. Your partner, family or friends might also find it helpful.

External beam radiotherapy is radiation directed at the prostate from outside the body. Here, we describe how it treats prostate cancer, as well as the possible side effects.

There are other types of radiotherapy called brachytherapy and radiotherapy for relieving pain in advanced prostate cancer. You can read about these in our other Tool Kit fact sheets.

How does radiotherapy work?

The aim of radiotherapy is to destroy prostate cancer cells without causing too much damage to healthy cells. External beam radiotherapy involves directing high energy X-ray beams at the prostate gland from outside the body. These beams damage the cells and stop them from dividing and growing. Cancer cells are not able to recover from this damage and die, but healthy cells can repair themselves more easily.

Radiotherapy treats the whole prostate, and sometimes the area surrounding it. It aims to

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What types of external beam radiotherapy are there?

There are two common types of external beam radiotherapy:

- 3-dimensional conformal radiotherapy (3D-CRT), and
- intensity modulated radiotherapy (IMRT).

You may also hear about image guided radiotherapy (IGRT). This is used as part of all radiotherapy treatments. Taking images of the prostate before your treatment allows your radiographer to make small changes to the area that is going to be treated so that the surrounding healthy tissue gets as little radiation as possible. IGRT also makes sure the whole prostate is treated.

3D conformal radiotherapy (3D-CRT)

With 3D-CRT, a computer uses the scans from your radiotherapy planning session to map the location of your prostate, as well as its size and shape. The radiotherapy machine gives beams of radiation that match the shape of the prostate as closely as possible. This helps to avoid damaging the healthy tissue around it, reducing the risk of side effects.

Intensity modulated radiotherapy (IMRT)

With IMRT, the radiation beams are also mapped to the size, shape and position of the prostate. But the strength of the radiation can also be controlled so that different areas get a different dose. This means a higher dose of radiation can be given to the prostate, without causing too much damage to the surrounding tissue.

Some hospitals offer 3D-CRT and others IMRT. Both of these are effective ways of treating prostate cancer. Ask your doctor or radiographer which type of radiotherapy you're being offered.

Stereotactic radiotherapy

Stereotactic radiotherapy, also known as stereotactic ablative radiotherapy (SABR), is a newer type of radiotherapy. It is a very precise treatment which means the cancer itself gets a high dose of radiation, while the surrounding tissue gets less. It may also mean you need fewer treatment sessions. Cyberknife is an example of stereotactic radiotherapy. It delivers many thin beams of low-dose radiation from different angles that all target the cancer.

At the moment, stereotactic radiotherapy for prostate cancer is only available as part of a [clinical trial](#). Speak to your doctor, nurse or radiographer if you're interested in it.

What are the advantages and disadvantages?

What may be an advantage for one person might not be for someone else. If you're offered external beam radiotherapy, speak to your doctor, nurse or radiographer before deciding whether to have it. They'll be able to help you decide whether it's the right option for you. Ask about any [other treatments](#) that might be available.

There's usually no rush to make a decision, so give yourself time to think about whether radiotherapy is right for you.

Advantages

- You can usually carry on with many of your normal activities while having treatment.
- Radiotherapy can be an option even if you're not fit or well enough for [surgery](#).
- Radiotherapy is painless, but you might find the treatment position slightly uncomfortable.
- Daily treatment sessions only last 10 to 20 minutes, including the time it takes to get you into position.
- You don't need to stay in hospital overnight.

Disadvantages

- You will need to go to a specialist hospital for treatment five days a week for several weeks. This might be difficult if you need to travel far.
- Radiotherapy can cause side effects such as bowel, urinary and erection problems, as well as tiredness and fatigue.

- It may be some time before you know whether the treatment has been successful.
- If you have radiotherapy as your first treatment and your cancer comes back or spreads, [surgery](#) might not be possible. [Read about treatment options if your cancer comes back.](#)



Our Specialist Nurses

Ask all the questions you need answers to, or just talk. Our nurses have time for you.

[Find out more](#)

What does treatment involve?

Your treatment will be given at a hospital radiotherapy department. You'll see a specialist doctor who treats cancer with radiotherapy, known as a clinical oncologist. You may also see a specialist nurse and a specialist radiographer. They'll talk to you about your treatment plan and ways to help any side effects.

Before treatment

Radiotherapy planning session

A week or two before your treatment, you'll have a planning session. This is to make sure the radiographers know the exact position, size and shape of your prostate. It will help them make sure the radiotherapy is aimed at your prostate and that the surrounding areas get as little radiation as possible.

- You'll have a **CT (computerised tomography) scan**, and possibly an **MRI (magnetic resonance imaging) scan**.
- Your radiographer will make three very small permanent marks (tiny tattoos) on your skin. This will help to get you into the right position when you go for each treatment.
- At some radiotherapy departments, you may have three or four gold seeds, called fiducial markers, put inside the prostate. These are about the size of a grain of rice. An ultrasound probe is put into your back passage (rectum) and the seeds are passed through the probe using a hollow needle. The seeds show up on x-ray images and help the radiographer see the exact position of the prostate each day.
- Your radiographer will let you know how full or empty your bladder and bowel should be during treatment. This helps to make sure your radiographer treats the right area each time.

Anti-oxidants and radiotherapy

Talk to your doctor or nurse if you take anti-oxidant supplements. Although anti-oxidants are substances that are thought to stop or delay some types of cell damage, some research suggests that anti-oxidants might protect the cancer cells from radiotherapy. This means that anti-oxidants might make radiotherapy less effective. We need more research to understand the risks or benefits.

Treatment

You will have one treatment (known as a fraction) at the hospital five days a week with a rest over the weekend. You can go home after each treatment.

Treatment normally lasts between seven and eight weeks. In some radiotherapy departments you may be offered a shorter course (see below).

At the beginning of each treatment, the radiographer will help you get into the exact same position you were in at your planning session. They'll use the marks made on your body as a guide and may also take a scan.

The treatment then starts and the machine moves around your body. It doesn't touch you and you won't feel anything. You'll need to keep very still, but the treatment only takes a few minutes. The whole session lasts 10 to 20 minutes, including the time it takes to get you into position.

It's safe for you to be around other people, including children and pregnant women, during your course of radiotherapy. The radiation doesn't stay in your body so you won't give off any radiation.

Radiotherapy affects each man differently, but many men are able to carry on with their normal day-to-day activities. You may be fine to continue to work while having radiotherapy, or you may find it tiring and need time off work. If you have any questions, speak to your doctor, nurse or radiographer, or [call our Specialist Nurses](#).

Shorter courses of radiotherapy

Researchers are looking at different ways of giving a slightly lower dose of radiotherapy over a shorter time, using fewer but higher doses of radiotherapy at each treatment session. This means a course of radiotherapy lasts four weeks rather than seven. This is called hypofractionation.

- What are the advantages and disadvantages?
- What does treatment involve?
- What happens next?

or radiographer

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What happens next?

After you've finished your radiotherapy, you will have regular check-ups to monitor your progress. This is often called follow-up. The aim is to:

- check how your cancer has responded to treatment
- help you deal with any side effects of treatment
- give you a chance to raise any concerns or ask any questions.

[Read more about follow-up after treatment.](#)

PSA test

You will usually have a [PSA test](#) a week or two before your appointment, so the results are available at your check-up. This can often be done at your GP surgery. PSA tests are a very effective way of checking how well your treatment has worked.

After treatment, your PSA should start to drop. Your PSA level won't fall to zero as your healthy prostate cells will continue to produce some PSA. How quickly your PSA levels drop, and how low they fall, will depend on whether you had [hormone therapy](#) alongside radiotherapy. If you had radiotherapy

on its own, it may take 18 months to two years for your PSA level to fall to its lowest level (nadir).

Your PSA level may actually rise after your treatment is finished, and then fall again. This is called 'PSA bounce'. It could happen up to three years after treatment. It is normal, and doesn't mean your cancer has come back.

If your PSA level rises by 2 ng/ml or more above its lowest level, or if it rises for three or four PSA tests in a row, this could be a sign that your cancer has come back. Your doctor will continue to check your PSA level and will talk to you about further tests and treatment options.

Treatment options if your prostate cancer comes back

If your first treatment was [radiotherapy](#), you might be able to have:

- [HIFU](#) (high-intensity focused ultrasound)
- [cryotherapy](#)
- [hormone therapy](#)
- [brachytherapy](#)
- [surgery](#).

There is no standard or best treatment after radiotherapy - your treatment options will depend on you and your cancer.

Having these treatments may have a higher risk of side effects than if used as a first treatment. More research is also needed to look at how well treatments after radiotherapy work in the long-term.

Ask your doctor which treatments might be suitable for you.

[Read more about treatment options if your prostate cancer comes back.](#)





Our online community

Confront prostate cancer together. Join our online community and talk about what's on your mind - your questions, your ups and your downs.

[Find out more](#)

What are the side effects?

Like all treatments for prostate cancer, radiotherapy can cause side effects. These will affect each man differently, and you might not get all of the possible side effects. Before you start treatment, talk to your doctor, nurse or radiographer about the side effects. Knowing what to expect can help you deal with them.

Side effects happen when the healthy tissue near the prostate is damaged by radiotherapy. Most healthy cells recover so side effects may only last a few weeks or months. But some side effects can start months or years after treatment. These can become long-term problems.

If you have hormone therapy as well as radiotherapy, you may also get [side effects from the hormone therapy](#).

If you've already had treatment for prostate cancer such as [surgery](#), and are experiencing side effects, then having radiotherapy afterwards can

make those side effects worse or last longer. Radiotherapy may also cause other side effects.

The most common side effects of radiotherapy are described here.

Short-term side effects

Urinary problems

Radiotherapy can irritate the lining of the bladder and the urethra (the tube men urinate and ejaculate through). Symptoms can include:

- needing to urinate often, including at night
- a sudden urge to empty your bladder
- a burning feeling when you urinate
- difficulty urinating (urine retention)
- blood in your urine.

You might also leak urine (urinary incontinence) after radiotherapy, but this is less common. This may be more likely if you've previously had an operation called a transurethral resection of the prostate (TURP) for an enlarged prostate.

Urinary problems tend to start mid way through your treatment and may begin to improve two to three weeks after treatment finishes. Some men continue to have side effects for several months. If you get any urinary problems, tell your doctor, nurse or radiographer. There are treatments to manage them, as well as things you can do to help yourself. [Read more about urinary problems and how to manage them.](#)

Bowel problems

Your bowel and back passage (rectum) are close to the prostate.

Radiotherapy can irritate the lining of the bowel and rectum (called proctitis) –which can cause bowel problems. Before you start radiotherapy, tell your doctor if you've had any bowel problems in the past as this could mean you're more likely to get bowel problems.

Symptoms vary from man to man, and some will notice a slight change rather than a problem. Common bowel problems can include:

- loose and watery bowel movements (diarrhoea)
- passing more wind than usual
- needing to empty your bowels more often, or having to rush to the toilet
- leaking a clear, jelly-like mucus from your back passage
- feeling an urge to empty your bowels, but then not being able to
- a feeling that your bowels haven't emptied properly
- pain in your abdomen (stomach area) or back passage
- bleeding from your back passage – this isn't usually something to be worried about, but let your doctor, nurse or radiographer know if it happens
- leaking from your back passage (faecal incontinence) – this is rare

Bowel problems usually start during or shortly after your treatment and may begin to settle down a few weeks after finishing treatment. Some men may find that some of their side effects last longer.

Tell your doctor, nurse or radiographer about any changes in your bowel habits. There are often things you can do to help yourself and simple treatments available, such as medicines to control diarrhoea.

If you're gay, bisexual or a man who has sex with men, and are the receptive partner ('bottom') during anal sex, then bowel problems after radiotherapy may affect your sex life. You may need to wait until any problems or sensitivity has settled before having anal sex. [Read more about side effects of prostate cancer treatment and how they may affect gay and bisexual men.](#)

Tiredness and fatigue

The effects of radiation on your body can leave you feeling very tired, especially towards the end of your treatment. If you're having hormone therapy as well as radiotherapy then this may also make you feel tired.

Fatigue is extreme tiredness that can affect your everyday life. It can affect your energy levels, your motivation and your emotions – which can be hard

to cope with. Fatigue can continue after the treatment has finished and may last several months.

There are things you can do to help manage fatigue. [Read more about fatigue and how to manage it.](#)

Problems with ejaculation

You may find ejaculation uncomfortable and notice that you produce less semen during and after treatment. You may have a 'dry orgasm', where you feel the sensation of orgasm but don't ejaculate. This may feel different to the orgasms you're used to.

Skin irritation and hair loss

During treatment, the skin between your legs and near your back passage may become sore – but this is rare. Your radiographer will talk to you about how to look after your skin during treatment.

Radiotherapy might also make some of your pubic hair fall out. But it usually grows back after treatment.

If you're worried about any of these side effects, speak to your doctor, nurse or radiographer. You can also [call our Specialist Nurses.](#)

Long-term or later side effects

Sometimes side effects can develop much later – several months, or even years, after finishing treatment. If this happens, then these side effects can last a long time.

Talk to your doctor or nurse about your own risk of long-term side effects. You might be more likely to get them if:

- you're older
- you have diabetes
- you've had bowel or prostate surgery in the past
- you've had bladder, bowel or erection problems in the past.

Urinary problems

If you had urinary problems during treatment, you may be more likely to develop problems later on. These may be similar to the short-term side effects (see above).

Radiotherapy can cause the urethra to become narrow over time – this is called a stricture. This is more likely if you have [brachytherapy](#) combined with external beam radiotherapy. If this happens you will find it difficult to urinate. Symptoms can include:

- feeling that your abdomen (stomach area) is swollen
- feeling that you're not emptying your bladder fully
- a weak flow when you urinate.

Speak to your doctor or nurse if you get any of these symptoms.

[Read more about urinary problems and how they can be managed.](#)

Bowel problems

Although bowel problems often improve once treatment has finished, some men will find that changes to their bowel habits last a lot longer.

Bowel problems can develop months or years after treatment and may be similar to the short-term side effects (see above). If you had bowel problems during treatment, you may be more likely to develop problems later on.

Try not to be embarrassed to tell your hospital doctor or your GP about any bowel problems. There are treatments that can help. Bowel problems can be common in older men, so it's possible that they're caused by something other than radiotherapy. Your hospital doctor or your GP can arrange tests to find out what's causing the problems, or they may refer you to a bowel specialist.

If you have long-term bowel problems, you might be offered a test called a flexible sigmoidoscopy. This is where a narrow tube with a camera on the end is put into your back passage to check for any damage to the bowel.

Erection problems

Radiotherapy can cause problems getting or keeping an erection (erectile dysfunction). Other treatments for prostate cancer such as [hormone therapy](#), other health problems, certain medicines, tiredness and fatigue, and depression or anxiety can all cause erection problems. Erectile dysfunction caused by radiotherapy often takes a while to appear and it can be up to two years before you notice any problems. Erection problems can also get worse over time.

There are lifestyle changes you can make as well as treatments that may help you manage erection problems or sometimes prevent them. These often work best if you start them soon after radiotherapy. Talk to your doctor, nurse or radiographer to find out more.

[Read more about treating erection and other sexual problems, and practical tips to help with your sex life.](#)

Having children

Radiotherapy can damage the cells that make semen and cause you to have a dry orgasm (where you don't ejaculate). You may want to consider storing your sperm before you start radiotherapy, so that you can use it later for fertility treatment – if you want to. Ask your doctor, nurse or radiographer about sperm storage.

There is a very small chance that radiotherapy could affect any children you might conceive during treatment, so you may wish to use contraception during and for at least a year after radiotherapy if there is a chance of your partner becoming pregnant. You can also ask your doctor, nurse or radiographer for advice. It is safe for you to have sex with your partner – you won't pass on your cancer or any radiation.

Lymphoedema

If your lymph nodes are treated with radiotherapy, there is a slight chance that fluid might build up in your tissues. This is called lymphoedema. It usually affects the legs, but it can affect other areas, including the penis or testicles. It can occur months or even years after treatment. Speak to your doctor or nurse if you start to get any unusual swelling. [Read more about managing lymphoedema.](#)

Hip and bone problems

Radiotherapy can damage the bone cells and the blood supply to the bones near the prostate. This can cause pain, and hip and bone problems later in life. **Hormone therapy** can also weaken your bones, so you might be slightly more likely to have hip and bone problems if you have both hormone therapy and radiotherapy.

Other cancers

Radiotherapy can damage the cells in the tissues surrounding the prostate. There is a very small chance that this could increase your risk of bladder or bowel cancer. It would take at least 5 to 10 years after treatment with radiotherapy for a second cancer to appear.

Smoking and side effects

Researchers have been looking at whether smoking increases the chance of having long-term bowel and urinary problems after radiotherapy for prostate cancer. At the moment only a small number of studies have been done, so we need more research into this. If you're thinking of stopping smoking there's lots of information and support available.



One-to-one support

Anyone affected by prostate disease can talk with one of our trained support volunteers.

[Find out more](#)



Living with prostate cancer

Dealing with side effects of prostate cancer, practical tips and how to manage.

[Find out more](#)

Questions to ask your doctor, nurse or radiographer

- What type of radiotherapy will I have?
- How many sessions will I need?
- What other treatment options do I have?
- What are the possible side effects and how long will they last?
- What treatments are available to manage the possible side effects from radiotherapy?
- Will I have hormone therapy and will this carry on after radiotherapy?
- How and when will I know if radiotherapy has worked?

- If the radiotherapy doesn't work, which other treatments can I have?
- Who should I contact if I have any questions?
- What support is there to help manage long-term side effects?



Our Specialist Nurses

Ask all the questions you need answers to, or just talk. Our nurses have time for you.

[Find out more](#)

References

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 [List of references](#)

