

UNDERSTANDING

Radiation therapy

for prostate cancer

Information on external beam radiation therapy and brachytherapy for men diagnosed with prostate cancer.



Prostate Cancer
Foundation of Australia

Radiation therapy for prostate cancer

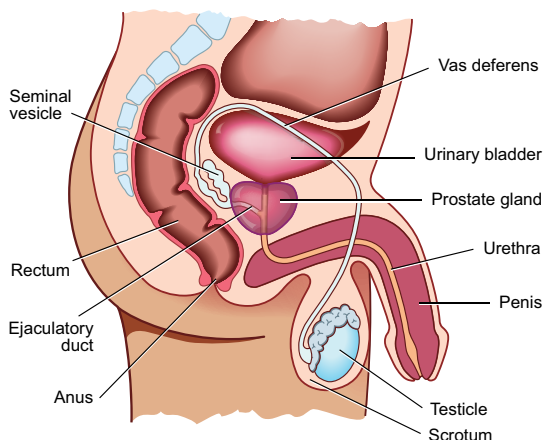
What is prostate cancer?

The prostate is a small gland located below the bladder and in front of the rectum in men. It surrounds the urethra, the passage that leads from the bladder, out through the penis through which urine and semen pass out of the body. The prostate gland is part of the male reproductive system (see diagram).

The prostate produces some of the fluid that makes up semen, which enriches and protects sperm. The prostate needs the male hormone testosterone to grow and develop. Testosterone is made by the testicles.

In an adult, the prostate gland is usually about the size of a walnut and it is normal for it to grow larger as men age. Sometimes this can cause problems, such as difficulty with passing urine.

The male reproductive system



Prostate cancer occurs when abnormal cells develop in the prostate. These cells have the potential to continue to multiply, and possibly spread beyond the prostate. Cancers that are confined to the prostate are called **localised** prostate cancer. If the cancer extends into the surrounding tissues near the prostate or into the pelvic lymph nodes, it is called **locally advanced** prostate cancer. Sometimes it can spread to other parts of the body including other organs, lymph nodes (outside of the pelvis) and bones. This is called **advanced** or **metastatic** prostate cancer. However, most prostate cancers grow very slowly and about 95% of men survive at least 5 years after diagnosis, particularly if diagnosed with localised prostate cancer.

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Radiation therapy for prostate cancer

1. Introduction

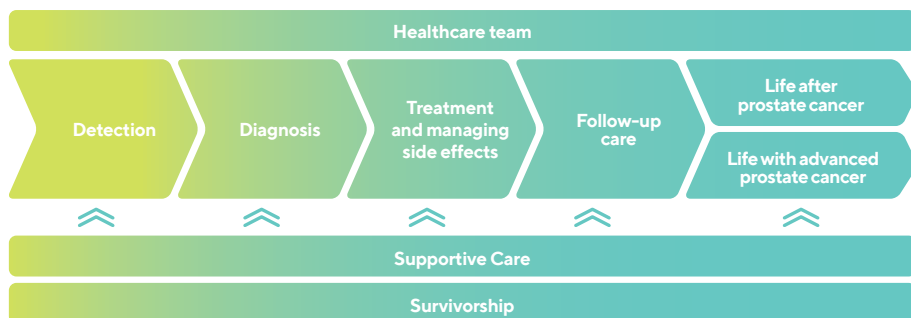
This booklet is for men who are making decisions about prostate cancer treatment and those who have already received treatment. It contains information to help you understand important issues about radiation therapy treatments, including external beam radiation therapy (EBRT) and brachytherapy. It may also be helpful for your partner, family or friends to read this booklet.

Your cancer experience

After being diagnosed with prostate cancer, it's common for you to see a number of health professionals with different expertise who work together in a healthcare team (sometimes called a multidisciplinary team). This team includes health professionals who are involved in diagnosing your cancer, treating your cancer, managing your symptoms and side effects, and assisting you with your feelings or concerns during your cancer experience.

Your prostate cancer experience

The cancer experience is not the same for everybody, even for those with the same type of cancer. Depending on the grade (the cancer aggressiveness) and stage (the extent of spread) of your prostate cancer and any underlying medical conditions, your experience may be quite different to someone else's.



As the diagram above shows, it can be useful to think of the cancer experience in different stages: detection, diagnosis, treatment, follow-up care and either life after cancer or life with advanced prostate cancer. Take each stage one at a time so that you can break down what might feel like an overwhelming situation into smaller, more manageable steps.

From the moment prostate cancer is detected, your healthcare team will focus on survivorship – every aspect of your health and wellbeing while you are living with cancer and beyond. Survivorship also includes your family and loved ones.

2. What is radiation therapy for prostate cancer?

Radiation therapy for prostate cancer

Radiation therapy uses high energy X-ray beams directed at the cancer. This delivers a controlled dose of radiation to damage and kill cancer cells. It is sometimes referred to as radiotherapy.

Radiation therapy works by damaging the DNA in cancer cells. When the DNA is damaged beyond repair, the cells stop dividing and eventually die. It can take several treatments before DNA is damaged enough for cancer cells to die. For this reason, radiation therapy is often given as a course of treatment over several days or weeks.

Radiation therapy is a localised treatment, meaning it targets a specific part of the body. Any side effects you may experience will be limited to the area being treated.

Radiation therapy can be used as the main treatment for localised or locally advanced prostate cancer. It can also be used for men who have advanced prostate cancer.

Who can have radiation therapy for prostate cancer?

Radiation therapy may be used in men of all ages who have prostate cancer. It can be offered at any stage of prostate cancer.

For localised or locally advanced prostate cancer, radiation therapy may be offered:

- as your main treatment to cure the cancer
- if you are unable to have surgery due to other health issues
- if you have had prostate surgery and need additional treatment for any cancer that is left in the pelvic area or for cancer that comes back.

For advanced or metastatic prostate cancer, radiation therapy may be offered:

- to treat the cancer growing in the prostate gland to slow its growth and extend your life
- to treat cancer that has spread to your bones to reduce pain (this is called palliative radiation therapy).

Radiation therapy for prostate cancer

Types of radiation therapy

There are two ways of giving radiation therapy for prostate cancer:

External beam radiotherapy (EBRT): high energy X-ray beams are directed at the prostate from outside the body. Generally, people have this treatment in a hospital outpatient department five days per week for 4 to 8 weeks.

Internal radiation therapy (brachytherapy): radioactive material is inserted directly into the prostate. It is given at either at a low dose rate (LDR) or high dose rate (HDR).

- **LDR:** Given by implanting permanent radioactive seeds directly into the prostate. The seeds give off concentrated amounts of radiation to the prostate with the aim of killing the cancer cells and curing prostate cancer. They are placed in a surgical procedure that may take a few hours, and you may have to stay in hospital overnight.
- **HDR:** Given by inserting radioactive material directly into the prostate. Unlike LDR seeds, the material is only placed temporarily and for shorter periods. The procedure takes place in hospital and may require a longer stay than LDR.

Not all radiation therapy techniques are suitable for all men. A radiation oncologist can advise you which options suit you best.

Benefits of radiation therapy

- Radiation therapy is an effective and potentially curative treatment for prostate cancer.
- Radiation therapy can kill cancer cells that may have spread beyond the prostate (called locally advanced prostate cancer).
- Radiation therapy is minimally invasive.
- Most men can continue their usual activities during treatment, including work.

Possible side effects of radiation therapy

During treatment:

- urinary problems such as frequency, urgency and/or burning/discomfort when you urinate
- bowel problems such as frequency, urgency and/or discomfort when you open your bowels
- fatigue (tiredness).

After treatment:

- urinary problems such as frequency, poor flow and bleeding (short term or long term)
- bowel problems such as frequency, urgency and/or bleeding (short term or long term)
- erection and ejaculation problems (short term or long term)
- loss of fertility – you will not be able to father a child naturally.

Many of the side effects of radiation therapy can be managed effectively. See Section 6 on page 20.

Things to consider

- If you have EBRT, you will need to make regular visits to your treatment centre over a number of weeks.
- For higher risk cancers, you may need hormone therapy as well as EBRT for a period of 6 to 36 months.
- Sometimes side effects of radiation therapy can occur many years after treatment has finished.
- If you have low dose brachytherapy, the implanted seeds are radioactive so you may be advised to take certain precautions like using condoms for a while and minimising prolonged contact with babies or young children for a few months. If you have EBRT you will not be radioactive, and these precautions are not necessary.
- If you have poor urinary function before treatment, the risk of bothersome urinary problems may increase with radiation therapy.
- PSA levels after radiation therapy can take many months or several years to reach the lowest level. This means it may take several years to know how successful radiation treatment has been.
- If cancer recurs after radiation therapy, your doctor may recommend monitoring, hormone therapy or, less commonly, further treatment with surgery, radiation therapy or focal therapies.

Hormone therapy used with radiation therapy

Prostate cancer needs testosterone to grow. By reducing testosterone with medications, it is possible to slow the growth of the cancer. This is known as hormone therapy or androgen deprivation therapy (ADT).

Hormone therapy is often given together with radiation therapy. It may be given for a short time (4 to 6 months) or continued for 18 months to 3 years in higher risk prostate cancers.

Evidence has shown that using hormone therapy before and during radiation therapy can reduce the chance of the cancer spreading, reduce the size of the prostate, increase the effectiveness of radiation therapy, and improve survival for higher risk cancers.

Your radiation oncologist will discuss hormone therapy with you if it is needed. See page 20 for side effects of hormone therapy.

More information can be found in *Understanding hormone therapy for prostate cancer* downloadable at pcfa.org.au

Radiation therapy for prostate cancer

3. Deciding to have radiation therapy for prostate cancer

There are often several options to treat localised or locally advanced prostate cancer. These include surgery, external beam radiation therapy, brachytherapy or monitoring the cancer. Making a decision about which treatment is right for you can be challenging. It is helpful to see both a urologist and radiation oncologist to get a full understanding of the treatment options, possible side effects, benefits and costs of treatment.

Being fully informed will help you make the best decision for you about which treatment to have. This booklet will help you understand what is involved with radiation therapy and brachytherapy, the potential benefits of these treatments and what the side effects might be.

Support and information can also be obtained from your GP, Prostate Cancer Specialist Nurses and/or prostate cancer support group members.

It can also be very helpful to discuss treatment options with your partner or a family member and to take them along to your appointments.

Here are some questions you can ask your radiation oncologist or members of your healthcare team about radiation therapy.

- What does radiation therapy involve?
- What is the difference between EBRT and brachytherapy and which is best for me?
- What are the benefits and how likely are they?
- What are the possible side effects, how likely are they and how are they managed?
- What are the alternatives to radiation therapy?
- How will radiation therapy affect my quality of life?
- How will radiation therapy affect my sexual function or sex life?
- Will radiation therapy make me incontinent?
- What are the costs involved with radiation therapy?
- How may radiation therapy affect other health conditions I may have?
- If I want children, what are my options?
- How many treatment sessions will I have?
- What areas will be treated with radiation therapy?
- Will I need hormone therapy with radiation therapy?
- Are there any clinical trials that are an option for me?

4. What does external beam radiation therapy involve?

When external beam radiation therapy (EBRT) is used as the main treatment for prostate cancer, the radiation beam targets the whole prostate gland, some of the seminal vesicles and sometimes the lymph nodes in the pelvis. This is done using a machine called a linear accelerator to deliver a dose of radiation directly to the prostate.

It is usually given as a daily treatment (Monday to Friday) over 4 to 8 weeks. You go to the radiation therapy centre each day for treatment, but do not need to stay overnight at the hospital. Most radiation therapy centres do not open on weekends or public holidays, but, if necessary, treatment can be provided on these days also.

Radiation therapy is painless, like having an X-ray or CT scan. The treatment takes 15 to 30 minutes. Most men feel well enough to work, exercise, and continue with daily activities while having radiation therapy. You are not radioactive after treatment, and it is safe to be around people, including children or pregnant women.

EBRT techniques

Most men in Australia having radiation therapy for prostate cancer are treated with advanced techniques that aim to target the prostate or prostate bed precisely.

Intensity modulated radiation therapy (IMRT) and volumetric modulated arc therapy (VMAT) – the linear accelerator machine rotates around the body, delivering a radiation beam of varying intensity and shape. This precise targeting of the radiation beams around the prostate allows higher doses of radiation therapy to be given safely while reducing the chance of urinary or bowel side effects.

Image-guided radiation therapy (IGRT) – the exact position of the prostate will vary a little depending on how full the bladder and bowels are. IGRT involves taking images (X-rays or CT scans) of the prostate region just before treatment, while you are on the treatment bed. This allows the treatment team to adjust the plan before the radiation beam is turned on and ensures the radiation is given to the right location every time.

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Stereotactic radiotherapy

Stereotactic ablative body radiotherapy (SABR), also known as stereotactic body radiation therapy (SBRT), is a newer form of EBRT. This technology delivers high doses of radiation to the target area and requires fewer treatments (usually 5 or less).

The side effects of SABR/SBRT are like those seen with conventional radiation therapy for prostate cancer.

This technique is not suitable for all men. The long-term results and effectiveness from SABR/SBRT are still being studied so this treatment is not available in all radiation therapy centres around Australia. Access to this technique is through a clinical trial or a centre specialising in the technique. You should discuss your own situation with your radiation oncologist.

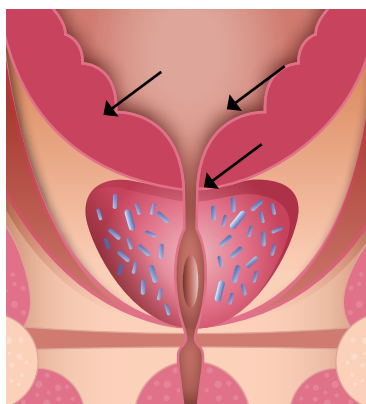
Planning and preparation for SABR/SBRT is similar to that for conventional EBRT.

Planning your treatment

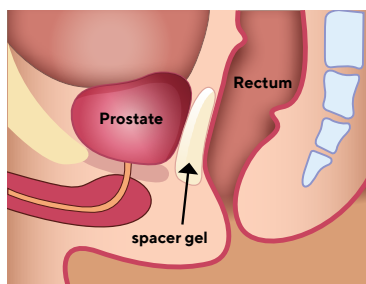
There are several steps to prepare for your radiation treatment. Your healthcare team will develop an individual treatment plan for you. This makes sure your treatment is as accurate as possible, delivers a high dose of radiation directly to the cancer and minimises damage to the surrounding healthy tissue. This helps to decrease side effects.

A week or two before starting treatment, you will attend a planning appointment. You will have a CT scan of your pelvis. This is used by the radiation therapy team to create your individual treatment plan.

Some men require additional steps or preparation as part of their planning. Your radiation oncologist will advise you if you need any of the following before your planning scan:



Fiducial marker seeds: Your radiation oncologist may advise you to have 3 small gold seeds inserted into the prostate 7 to 10 days before your planning CT scan. These seeds are about the size of a grain of rice. Unlike brachytherapy seeds, fiducial marker seeds are not radioactive. They are usually inserted using ultrasound guidance, in a similar technique to the prostate biopsy. The purpose of the seeds is to show exactly where the prostate is during both planning and treatment. This allows your radiation oncologist to target the prostate more accurately. Your radiation oncologist will discuss whether you need the seeds and will organise the procedure if you need it.



Prostate-rectum spacers:

Your radiation oncologist may offer a 'spacer', which is a temporary gel or balloon that is injected in between the prostate and bowel. This reduces the radiation to the bowel and lowers the risk of any bowel side effects. The procedure is usually done as a day procedure with a light anaesthetic. It is not commonly available in public hospitals and may not be suitable for all patients.

Magnetic resonance imaging (MRI):

An MRI of the prostate is sometimes recommended to aid with planning your treatment. If recommended, this is often scheduled close to your planning CT scan.

Bladder and bowel preparation:

To keep the prostate in a consistent position, the radiation oncology team will provide instructions about your bladder and bowels for both the planning scan and for treatment. Commonly, you will be advised to have a comfortably full bladder and to have emptied your bowel prior to the planning scans and for treatment each day.

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Planning CT scan appointment

After you have finished the preparation, you will be ready for your planning CT scan appointment. The radiation therapists will place you in the position required for treatment. A CT scan will be done, and you may be given a few small tattoo dots on the skin of your lower abdomen. These help the radiation therapists get you in the right position each day for treatment. The planning CT scan should take about 15 minutes.

Having treatment

Your radiation therapy treatment will begin a few weeks after your planning CT scan. During this time, your radiation oncology team will use the information from your planning CT to design an individual treatment plan for you.

Your treatment visit will usually last around 15 to 30 minutes. Most of this time is spent setting up your treatment so it's exactly right for you.

The radiation treatment itself is relatively short and completely painless. You will be taken into the treatment room by the radiation therapy team. They will position you on the bed in the same way as they did during your planning appointment. You may feel the couch move a little while you are being positioned.

Your treating team will leave the room while the radiation beam is switched on, but they will stay in contact with you through TV monitors and an intercom. You will probably hear the buzz of the machine while it is working and turning, but you will not be able to see or feel the radiation beam.

Once your treatment is completed, you will be able to continue with your usual activities for the rest of the day. Most men will be able to work, drive and exercise as normal.



CT scans and X-rays during treatment

Each day, just before your radiation treatment, a CT-scan, X-ray, or both will be done while you are lying on the treatment machine. These scans are done to check that your prostate (or, if you've had surgery, the region around your prostate) matches up with the planning CT scan.

Often, small adjustments may be needed to line everything up correctly for the treatment. These images do not show the cancer cells and are not used to monitor how the treatment is going. Instead, they ensure the radiation therapy is accurately targeting the correct area. Sometimes these scans show that your bladder or bowel position is not quite right, and the treatment team may ask you to drink more fluid or open your bowels before treatment is given.

Treatment reviews

During treatment, you will need to attend the clinic several times to see the radiation oncologist, registrar (radiation oncologist in training) and/or nurse. This is an opportunity to discuss any side effects you are experiencing. Towards the end of treatment, your follow-up appointments are planned and discussed with you.

Post-prostatectomy radiotherapy

Some men need a course of radiation therapy after they have had surgery to remove the prostate (called a radical prostatectomy). This option is given to treat prostate cancer cells that may remain behind or that have come back in the pelvic area after surgery.

EBRT may be recommended after surgery if:

- there were cancer cells found in some of the lymph nodes that were removed from the pelvis at the time of surgery
- your PSA levels remain detectable after surgery or have started to rise. This is called salvage radiotherapy
- your PSA levels have been rising after surgery and imaging scans have found an area in the pelvis where the cancer has come back.

Radiation therapy given after radical prostatectomy will target the prostate bed and/or the lymph nodes. The prostate bed is the space between the bladder and bowel where the prostate used to be. There will be a delay before treatment begins to allow time for you to recover from surgery.

The planning process for post-prostatectomy radiotherapy is very similar to that for conventional EBRT and the usual length of treatment is 6 to 7 weeks. For details refer to page 10.

Radiation therapy for prostate cancer

5. What does internal radiation therapy (brachytherapy) involve?

Brachytherapy is a type of radiation therapy in which a radioactive source is placed directly into the prostate gland.

There are two major forms of brachytherapy for prostate cancer:

- permanent low dose rate (LDR) brachytherapy
- temporary high dose rate (HDR) brachytherapy.

They differ in the time the radioactive source remains inside the body, as well as the rate at which the radiation dose is delivered

Permanent low dose rate (LDR) brachytherapy

LDR brachytherapy, or 'seed' implants, is when radioactive seeds are inserted permanently into the prostate. These seeds give off radiation to the entire prostate gland to destroy the cancer cells. The radiation only travels a very short distance, so it is limited to the prostate and only a few millimetres around it.

LDR brachytherapy is usually used to treat cancer in men who:

- have localised prostate cancer
- have a Grade group of 2 or less (Gleason score of 7 or less)
- have a PSA level lower than 10ng/ml
- have minimal urinary symptoms.

Men who do not meet these criteria may still be suitable for brachytherapy. You can discuss your individual circumstances with your radiation oncologist.

Planning your treatment

You will have a procedure called a 'volume study' to assess the size and position of your prostate. This will also provide information about whether your pelvis is suitable to allow the radiation oncologist access to your prostate with the needles. Uncommonly, some men have a small pelvis and their prostate may be difficult to access. During the volume study, precise measurements of the prostate gland are taken to plan how many seeds are needed and where they will be positioned.

The volume study may be done under a light general anaesthetic, or you may have a spinal anaesthetic (which numbs the area from the waist down for the period of the procedure) or sedation. It involves taking ultrasound pictures with a probe in the rectum and takes around 20 minutes.

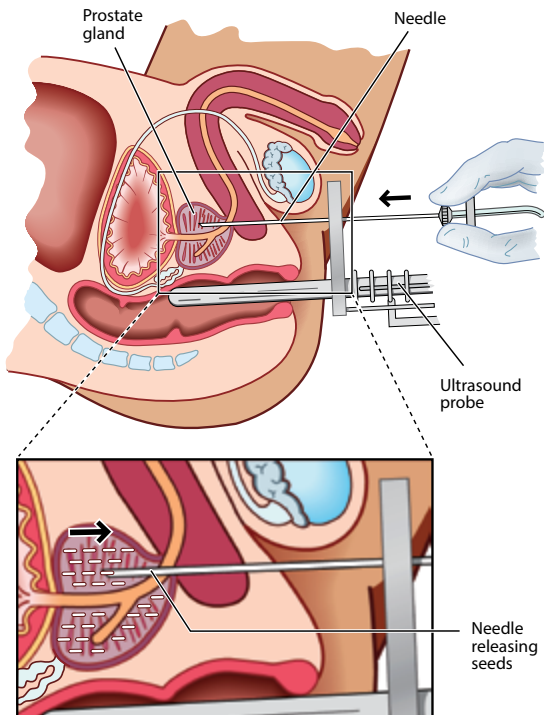
Before the procedure, you may be given medication, a special diet or an enema to clear your bowel. You may be given some oral antibiotics.

You should be able to go home soon after the procedure.

The implant procedure

If you are having LDR brachytherapy, you will be admitted to hospital on the day of your procedure unless there is a specific concern that means you need to be admitted earlier. You will be given either a general anaesthetic or local spinal anaesthesia (epidural).

The radiation oncologist or urologist will insert an ultrasound probe into the rectum and the image of your prostate can then be viewed on a screen. They will then insert 20 to 30 hollow needles through the perineum (skin between the scrotum and anus) into the prostate to place approximately 60 to 100 small radioactive seeds into the prostate through the needles. Placement of the needles is guided by a template and ultrasound images. See the diagram below.



Radiation therapy for prostate cancer

After the procedure

- You will remain in the theatre recovery area for a short period of time before being transferred to the ward.
- You may have an ice pack placed between your legs to help reduce swelling to the implant area.
- You will be given some pain-relieving medication after the procedure, though the pain usually settles quickly.
- You may have a catheter in place to drain urine and this may be removed a few hours after the procedure.
- You will be given antibiotics to prevent infection.
- You may be given medication to avoid constipation.
- You can usually start eating and drinking once you are awake.
- Tell a member of your healthcare team if you are experiencing pain, as they can help manage this.

You may be able to have the treatment as a 'day-only patient' or be booked for an overnight stay.

Radiation aftercare

It is normal for you to be concerned about radiation safety – but it's important to remember that whilst the seeds are radioactive, most of the radiation is absorbed by the prostate. Normal social contact will not put you or anyone around you at risk.

Objects that you touch, or come in contact with, **do not** become radioactive. Bodily wastes, (urine and stools) are **not** radioactive either.

However, as a precaution, for the first couple of months you should avoid having small children on your lap for long periods of time and you should avoid prolonged physical contact with pregnant women. Your healthcare team will give you specific instructions on this issue.

What to do if you 'pass' any seeds

- It is rare to pass a seed when you empty your bladder. If you do see a seed in the toilet bowl, flush until it disappears.
- If you find a seed in your clothing, use a pair of tweezers to throw it in the toilet bowl and flush until it disappears.
- You may be provided with a small lead pot and strainer to use for 1 to 2 weeks in the case that a seed does pass in the urine.

Sexual activity

You are recommended to use a condom for a period of time after the seeds are implanted, for example, for a number of ejaculations or for 1 to 2 months. Your treating team will advise you. If your partner is pregnant, ask your doctor if it is safe to have sex.

Be aware that your semen may be discoloured for the first few weeks after treatment. Some men experience some pain with the first few orgasms. This is normal and will get better over time.

Temporary high dose rate (HDR) brachytherapy

Temporary HDR brachytherapy involves placing approximately 16 to 20 small plastic catheters, or flexible needles, into the prostate and giving a temporary radiation treatment through these catheters.

Placement of the plastic catheters is done in a similar way to placement of the needles for LDR (see image on page 18). The radioactive source is passed through the plastic catheters into the prostate gland.

Unlike LDR, the insertion of radioactive material is temporary for HDR brachytherapy. This means that after HDR treatment, there will not be any radioactive material left inside your body.

If you are having HDR brachytherapy, you will have a procedure to place implant catheters into the prostate gland through a template placed over the area between the scrotum and the rectum (the perineum). The radioactive material is passed through these implant catheters to deliver the treatment directly into the prostate gland. Unlike LDR brachytherapy, there is no radioactive material inside you after the treatment.

Most men have a course of EBRT before or after their brachytherapy procedure and may also have hormone therapy.

HDR brachytherapy is a treatment option for men with intermediate or high-risk prostate cancer. It is generally used to treat cancer in men who meet the following criteria:

- men with locally advanced prostate cancer – disease stage T3
- cancers with high Gleason scores and/or larger tumours.

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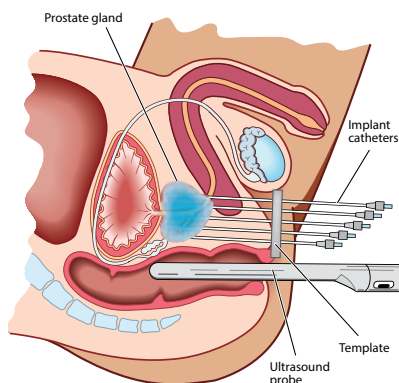
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The implant procedure

If you are having HDR brachytherapy, you will be admitted to hospital on the day of the procedure unless there is a specific concern that means you need to be admitted earlier. You will be given a general anaesthetic or a local spinal anaesthesia (epidural), which numbs the area from the waist down.

An ultrasound probe will be inserted into the rectum so that the image of your prostate can then be viewed on a screen. You will have a urinary catheter inserted at this time.

A template will be placed over the area between your scrotum and your anus. Implant catheters will be inserted through this template. The number will vary, but there are usually between 15 to 25 implant catheters. The template will remain in place along with the implant catheters until the treatment is completed. This is shown in the diagram below. Ask your doctor about your treatment plan as some men may have repeated treatments over a couple of days while others may need repeat implants separated over weeks.



Ultrasound-based planning technique

With an ultrasound planning technique, the placement of the catheters, delivery of treatment and removal of the catheters are all done under ultrasound guidance in the operating theatre, while you are asleep under anaesthesia. If the centre where you are having treatment has this facility, the treatment will be finished by the time you are woken up to be taken to back to the ward. This procedure usually takes 2 to 3 hours and you can be discharged from hospital the same day. You may need one or more than one theatre procedures. You will be discharged home after the urine is clear, the catheter is removed, and you have successfully passed urine. If not, you may need to stay in hospital overnight.

CT-based planning technique

With a CT planning technique, HDR brachytherapy is planned using a CT scan. If you are having treatment in a centre that uses this technique, the catheters are implanted in the prostate while you are asleep under anaesthesia. They are secured in place and you will need to lay flat until they are removed, which may be the same day or the next day. Keeping flat and still is important as movement may cause the implant catheters to move inside your prostate and this could affect your treatment. If they are bent, the procedure will have to be abandoned. If this happens, alternative options will be discussed by your healthcare team. Once the implant catheters are in place, an X-ray and CT scan are taken to help further planning for your treatment.

After your implant catheter insertion procedure

- You will remain in the theatre recovery area for a short period of time after the procedure and then be transferred to the ward.
- While the implant catheters are in place, you will be lying flat on your back.
- You will have a catheter to drain urine and this is usually left in place overnight.
- You will be given antibiotics to prevent infection.
- You can usually start eating and drinking once you are awake, though your diet may be restricted.
- You will have an intravenous drip in place to give you fluids.
- Speak to the healthcare team if you experience any pain or discomfort. You will receive pain relief for the duration of your stay.

Having your radiation therapy treatment

Your treatment will be given in the radiation therapy department or in a special operating theatre. The implant catheters are connected to the machine that delivers the radiation therapy treatment.

The treatment itself only lasts a few minutes. It may be repeated 2 to 4 times while the treatment implant catheters are in place. You will be returned to your ward area between treatments.

After your treatment

Once you have completed your whole course of treatment, the implant catheters, urinary catheter, epidural and intravenous drip will be removed.

You will then be able to go back to normal activity and pass urine as normal once the anaesthetic wears off. **It is important to tell your healthcare team immediately if you are unable to pass urine.**

You may experience discomfort around the site where the implant catheters were placed. Let your healthcare team know about any pain or discomfort and they can arrange medication to help.

Once you are functioning as normal, your healthcare team will talk to you about going home from hospital.

Unlike permanent radioactive seed brachytherapy (LDR), HDR is a temporary implant. After the procedure has been performed and the plastic needle catheters have been removed, there will be no radioactivity left in your body. You will not be radioactive. Your urine or other body fluids will not be radioactive either.

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6. Possible side effects of radiation therapy

All prostate cancer treatments, including radiation therapy, come with possible side effects. Generally, the types of side effects can be predicted but how severe they are can be different for each person. The important thing is for you to find out as much information as you can about your treatment and the possible side effects before you start, so that you can be better prepared.

Side effects from radiation therapy can be divided into two categories, early and late.

Early side effects

Throughout radiation therapy, most men feel well enough to drive, use public transport, work, exercise and continue their usual activities. If you experience any side effects, they are usually related to irritation caused by radiation to the lower part of the bladder, the urethra (the tube through the prostate through which urine passes), and the front part of the rectum (lower bowel).

At the beginning of treatment, most patients will have very few side effects. If you experience side effects, they will begin to appear a couple of weeks into treatment, gradually increasing towards the end of treatment. They will usually improve within 1 to 2 months of finishing treatment.

Fatigue

Feeling tired (fatigue) is quite common during radiotherapy. Travelling to the radiation therapy department each day can also make you feel tired. It is generally recommended to do a little light exercise each day, as this may reduce the tiredness. For most men, normal energy levels return a few weeks after finishing radiation therapy, but this may take longer for some.

Early urinary side effects

In the second half of treatment, it is common to experience some urinary changes, which can be due to irritation of the bladder and urethra. These symptoms can include:

- increased urinary frequency (needing to go to the toilet more often), especially at night
- stinging or burning while passing urine
- a sense of not completely emptying the bladder
- a stop/start or slower stream than before
- urgency to pass urine.

These symptoms are usually mild to moderate. It is important to drink enough fluids, especially water, as this will help to reduce the burning sensation. Aim for between 1500 to 2000mls of fluid per day.

Try to avoid too much caffeine (coffee or tea) and alcohol as these can make you need to pass urine more frequently. Avoiding excessive fluid intake in the evenings can reduce the need to pass urine overnight. If you experience burning or stinging when passing urine, ask your healthcare team if 'Ural' sachets are recommended. These sachets will help to neutralise the acid in the urine and reduce the burning or stinging when you urinate.

If the flow of urine slows down, or you have difficulty emptying your bladder, sometimes your doctor may recommend medication to improve your urine flow.

You need urgent medical help if you are unable to pass urine following your radiation therapy.

Contact your healthcare team and/or go to your closest hospital emergency department.

Early rectal (lower bowel) side effects

During the second half of treatment, some patients have a sense of needing to open their bowels more frequently or more urgently, though not much may be passed. Uncommonly, you may pass some mucous or have excess wind and/or discomfort when you go to the toilet. Occasionally, you may be prescribed suppositories to reduce the irritation in the bowels. Diarrhoea is very uncommon. If problems occur, ask your doctor to recommend changes to your diet and/or anti-diarrhoeal medications.

Late side effects

Late side effects can occur a few months or many years after treatment. They are much less common than early side effects. Some may only occur once and then go, others may last for a long time, and some may come and go over time. Most long-term side effects are mild, do not affect quality of life, and do not require any treatment.

Late urinary side effects

Radiation can cause scar tissue in the lower half of the bladder and this can cause problems in a small number of men. Some men will experience bleeding from the scar tissue. If bleeding occurs, you will be referred for a cystoscopy (telescope procedure into the bladder) to ensure that the bleeding is from the scar tissue and not another cause. In rare cases, heavy and prolonged bleeding occurs which may need to be treated by surgery.

UNDERSTANDING

Radiation therapy for prostate cancer

In some men, the scar tissue in the bladder causes changes in bladder function. You may experience reduced stream strength, a need to pass urine more often, and/or get the feeling of urgency (when you have to go, you have to go quickly). A small number of men may also leak some urine when they need to go. These side effects can be improved by doing a bladder training and/or pelvic floor muscle training program. You can ask for a referral to a physiotherapist for further advice.

Information about pelvic floor muscle training exercises can be found in *Understanding surgery for prostate cancer treatment* downloadable at pcfa.org.au

Scar tissue can also form in the urethra (called a urethral stricture) in about 2 to 3% of men. This slows or blocks the flow of urine from the bladder. It is more common in men who receive radiation after prostate surgery.

Late rectal (lower bowel) side effects

In some men, the radiation will cause damage to the rectum (called radiation proctitis), which can cause a change in bowel habits, excess mucous, and/or bleeding. If you bleed from the back passage, you will usually need a colonoscopy to check if the bleeding is from radiation treatment and not from another cause. These bowel changes are often mild and intermittent and can often go away on their own. If bleeding from the back passage doesn't go away, laser treatment might be recommended. In rare cases, surgery or oxygen therapy may be needed. Bowel incontinence (leaking poo) is rare.

Late sexual function side effects

The effect on your erectile function (ability to have and keep an erection) after radiation therapy depends on your age, erectile function before your treatment, whether you have also had surgery, and whether you are on hormone therapy. Erections can be reduced over time after radiation therapy, and difficulty achieving and maintaining an erection is common. The amount of ejaculate may be reduced, and fertility can be affected. However, there are many treatments available to help treat difficulties with erections.

Refer to *Understanding sexual issues following prostate cancer treatment* downloadable at pcfa.org.au

Sexuality and intimacy

Some couples are concerned that radiation therapy may impact on their sexual activity. Unlike surgery, radiation therapy doesn't usually have immediate effects on erectile function (your ability to get or keep an erection) unless hormone therapy is also given. Troubles with erectile dysfunction happen gradually over the first few years after radiation therapy.

Second cancers after radiation therapy

There is a very small risk of a second cancer arising as a result of radiation treatment. These most commonly grow in the bladder or bowel. However, most cancers that appear after radiation will not be related to your treatment. Studies following men after EBRT for more than 10 years suggest the increased risk is up to 1 in 70. For men treated with brachytherapy alone, this risk is lower. Your radiation oncologist will discuss your risk with you.

Hormone therapy side effects

If you have been prescribed hormone therapy in addition to radiation therapy, you may experience additional side effects such as hot flushes, night sweats and fatigue (feeling tired). Most men will also have a decrease in their libido (sex drive) and a decrease in the strength of their erections. Some men may also experience low mood or other mood changes and/or difficulty with memory.

Other hormone therapy side effects include weight gain from increased body fat, declining bone density and brittle bones (osteoporosis), breast swelling and tenderness and increased risk of cardiovascular disease and diabetes. Ask your doctor for advice if you experience any of these.

More information on possible side effects can be found in the following booklets downloadable at pcfa.org.au:

Understanding surgery for prostate cancer

Understanding urinary and bowel side effects of prostate cancer treatment

Understanding hormone therapy therapy for prostate cancer

Understanding sexual issues following prostate cancer treatment

Radiation therapy for prostate cancer

7. Ongoing care

After completing your course of radiation therapy, you will have ongoing follow up visits with your radiation oncologist to discuss any side effects of treatment you may be experiencing, and your PSA test results. You will need to have a PSA blood test a week before each appointment.

Discussion with your radiation oncologist may include:

- what urinary or bowel issues you may be experiencing
- erectile function and ongoing management based on your individual situation.

What does a rising PSA mean?

After radiation therapy, PSA levels will drop steadily and may take 18 months or more to reach the lowest level (the nadir). This means that it may be a few years before you know how successful your treatment has been. If you had hormone therapy at the same time as radiation therapy, the PSA level will drop much faster.

Small rises or fluctuations in the PSA level do not always indicate that the cancer has returned. Your radiation oncologist may recommend monitoring the PSA level for a period of time before any other tests or treatment are considered.

In some men, there can be a 'PSA bounce' in the first few years after treatment, where the PSA temporarily rises and then subsequently falls. This does not mean that the cancer has recurred and does not increase the risk of the cancer returning in the future.

If the PSA does continue to rise (e.g. 2.0ng/ml above nadir), this usually indicates that you still have prostate cancer cells in the body. Not all men who have a rising PSA will develop prostate cancer that affects health, and further monitoring may be recommended. Sometimes scans, such as MRI, CT/PET and/or PSMA-PET scans, will be recommended by your doctor to try to find where the cancer is before they discuss further management options with you.

Management options may include:

- hormone therapy
- biopsy of the prostate if scans suggest the cancer has come back within the prostate (see below)
- salvage local therapy to the prostate. This option may be considered if the cancer has come back in the prostate only (i.e. there is no evidence of cancer elsewhere). Salvage local therapy options include radical prostatectomy (surgery), prostate brachytherapy, stereotactic radiation therapy or focal therapies. When surgery is performed after radiation therapy, the risk of side effects, such as urinary incontinence, is higher
- radiation therapy with or without hormone therapy to the areas where cancer can be seen outside the prostate (e.g. pelvic lymph glands and/or other areas outside the pelvis such as bone).

To determine the best way to manage cancer that comes back, your case should be discussed by a multidisciplinary team.

8. Looking after yourself

Psychological wellbeing

If you have prostate cancer, it is normal to have a wide range of feelings and emotions such as shock, sadness, anxiety, anger, fear and frustration. You may also experience physical effects of stress like nausea, stomach upsets, feeling irritable or on edge, and trouble sleeping. Some days will be worse than others.

It can help to talk through your problems with a partner or good friend, gather information and advice from trusted sources, and focus on keeping well.

Our Prostate Cancer Counselling Service (PCCS) can help you with the psychological and emotional impacts of the disease. Whether you or someone you love has been impacted by prostate cancer, call **1800 22 00 99** to talk to our team about a referral.

Physical activity and exercise

Physical activity is very important for maintaining and improving your physical and psychological health. It is important to do some physical activity most days, if not every day.

Targeted exercises can help slow the progression of your prostate cancer, reduce the side effects of treatments and enhance your recovery. Exercise can also improve your quality of life and help with anxiety and depression.

The most effective forms of exercise are:

- cardiorespiratory exercise such as fast walking, jogging, cycling and swimming
- resistance training exercises such as lifting weights, stair climbing and high intensity resistance workouts.

Diet and nutrition

A healthy, balanced diet can improve your strength, vitality and wellbeing, help you manage your cancer experience, and improve your outcomes from treatment.

For the best diet:

- eat plenty of fruit and vegetables, wholegrain foods and lean meat, fish, poultry and low-fat dairy
- avoid animal fats, processed meals, biscuits, cakes and pies, salt and added sugars
- drink plenty of water
- limit alcohol
- stop smoking.

Information on wellbeing, diet and exercise can be found in *Understanding health and wellbeing with prostate cancer* downloadable at **pcfa.org.au**

Radiation therapy for prostate cancer

9. Where to get more information and support

Prostate Cancer Foundation of Australia (PCFA)
(02) 9438 7000/1800 22 00 99 (freecall)
Email: enquiries@pcfa.org.au
pcfa.org.au.

Beyond Blue: the National Depression Initiative – providing information about, and support for, anxiety and depression.

1300 22 46 36

www.beyondblue.org.au

Cancer Council Australia: providing professional telephone and online support, information and referral service.

13 11 20

www.cancer.org.au

Continence Foundation of Australia: providing information about bladder and bowel health and accessing support.

National incontinence helpline: 1800 33 00 66

Email: info@continence.org.au

www.continence.org.au

Dietitians Australia: find an accredited practising dietitian.

(02) 6189 1200

Email: info@dietitiansaustralia.org.au

dietitiansaustralia.org.au/find-an-apd

Exercise & Sport Science Australia (ESSA): find an accredited exercise physiologist.

(07) 3171 3335

Email: info@essa.org.au

www.essa.org.au/find-aep

Lifeline Australia: personal crisis support and suicide prevention.

13 11 14 (24-hour service)

www.lifeline.org.au

Targeting Cancer: information about radiation therapy.

www.targetingcancer.com.au

10. Sources

American Cancer Society: Radiation therapy for prostate cancer.

www.cancer.org/cancer/prostate-cancer/treating/radiation-therapy.html

Cancer Council Victoria: Radiation therapy.

www.cancervic.org.au/cancer-information/treatments/treatments-types/radiation-therapy/external-radiation-therapy.html

eviQ – Cancer Institute NSW:

www.eviq.org.au/radiation-oncology/urogenital/prostate

Go-rayski P, Pinkham MB and Lehman M. Advances in radiotherapy technology for prostate cancer: What every GP should know. **www.racgp.org.au/afp/2015/september/advances-in-radiotherapy-technology-for-prostate-cancer-what-every-gp-should-know/**

Management options for localised prostate cancer – CINSW

www.eviq.org.au/patients-and-carers/patient-information-sheets/3084-management-options-for-localised-prostate-can

Murray L, Henry A, Hoskin P, *et al.* Second primary cancers after radiation for prostate cancer: a systematic review of the clinical data and impact of treatment technique.

Radiotherapy Oncology. 2014 110(2):213. **www.ncbi.nlm.nih.gov/pmc/articles/PMC3988985/**

Targeting cancer – brachytherapy for prostate cancer

www.targetingcancer.com.au/radiation-therapy/brachytherapy/brachytherapy-for-prostate-cancer/

Targeting cancer – prostate cancer

www.targetingcancer.com.au/treatment-by-cancer-type/prostate-cancer/

Wallis CJD, Mahar AL, Choo R, *et al.* Second malignancies after radiotherapy for prostate cancer: systematic review and meta-analysis. British Medical Journal 2016 352:i851.

www.bmj.com/content/bmj/352/bmj.i851.full.pdf

Radiation therapy for prostate cancer

11. Glossary

Anaesthetic – A medication that stops you feeling pain during a medical procedure. A local anaesthetic numbs only a part of the body; a general anaesthetic puts you to sleep for a period of time.

Bladder – An organ in the pelvis that stores urine.

Brachytherapy – A type of radiotherapy treatment. It involves implanting radioactive material sealed in needles or seeds into or near the tumour.

Catheter – A hollow, flexible tube through which fluids can be passed into the body or drained from it.

Constipation – Bowel motions (faeces) that are infrequent and/or hard to pass.

Continence nurse – A specialist nurse who helps you manage any problems related to continence care (bladder and bowel problems) after treatment.

Diarrhoea – Having very frequent, loose bowel motions.

Dietitian – A health professional who specialises in human nutrition.

Erectile dysfunction – Inability to achieve or maintain an erection firm enough for penetration. This is also known as impotence.

General Practitioner (GP) – A family doctor. Your GP is the first person you see if you're sick. They can refer you to other medical specialists.

Grade – A score that predicts how quickly the tumour is likely to grow.

Hormone – A substance that affects how your body works. Some hormones control growth, others control reproduction.

Incontinence – Inability to hold or control the loss of urine or faeces.

Intravenous – Into a vein. An intravenous drip gives medication directly into a vein.

Metastatic prostate cancer – Prostate cancer that has spread from the prostate gland and started to grow in other parts of the body.

Oncologist – A doctor who specialises in treating cancer with different medications and treatments.

Pelvis – The area located below the waist and surrounded by the hips and pubic bone.

Pelvic floor muscles – A layer of muscles at the floor of the pelvis that stretch like a hammock from the tailbone at the back to the pubic bone in front. The pelvic floor muscles support the bladder and bowel. The urethra (urine tube) and rectum (back passage) pass through the pelvic floor muscles.

Physiotherapist – An allied health professional who specialises in movement and function of the body and advises on resuming normal physical activities.

Prostate Cancer Specialist Nurse – An experienced registered nurse who has received additional training to make them an expert nurse in prostate cancer care.

Prostate specific antigen (PSA) – A protein in the blood that is produced by cells in the prostate gland. The PSA level is usually higher than normal when prostate cancer is present.

Psychologist – A health professional who provides emotional, spiritual and social support.

Radical prostatectomy – An operation to remove the prostate gland and seminal vesicles.

Radiation therapy (radiotherapy) – The use of radiation, usually X-rays or gamma rays, to kill cancer cells or injure them so they cannot grow or multiply.

Radiation oncologist – A doctor who specialises in treating cancer using radiation therapy.

Side effect – Unintended effects of a drug or treatment.

Stage – The extent of a cancer and whether the disease has spread from an original site to other parts of the body.

Stereotactic radiation therapy – A technique to precisely position the radiation therapy beam in a three-dimensional space.

Support group – A group of people who provide emotional caring and concern, practical help, information, guidance, feedback and validation of the individual's stressful experiences and coping choices.

Testosterone – The major male hormone, which is produced by the testicles.

Urethra – The tube that carries urine and semen out through the penis and to the outside of the body.

Urologist – A surgeon who treats people with problems involving the urinary system, including the kidney, bladder, prostate and reproductive organs.

Radiation therapy for prostate cancer

You may wish to use this note section to record your progress or questions you may have about your symptoms following treatment.

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PROSTATE CANCER FOUNDATION OF AUSTRALIA (PCFA)

We are Australia's leading community-based organisation for prostate cancer research, awareness, and support. As the nation's predominant charity fund for Australian-based prostate cancer research, we exist to protect the health of existing and future generations of men in Australia and to improve quality of life for Australian men and families impacted by prostate cancer.

Our vision is a future where no man dies of prostate cancer and Australian men and their families get the support they need.

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For a full list of contributors and reviewers, please visit the PCFA website: pcfa.org.au

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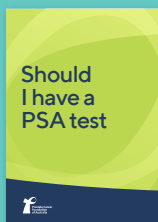
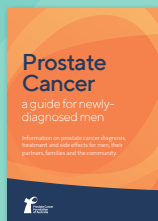
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