

External beam radiotherapy with a brachytherapy boost (a combination treatment)

This leaflet explains more about having combination treatment – radiotherapy with a brachytherapy boost – to treat your prostate cancer. It provides information on why this treatment may be suitable for you, its risks and benefits, and what to expect during the treatment. If you have any further questions, please speak to your specialist nurse.

What is external beam radiotherapy?

Radiotherapy is the use of radiation to treat cancer. It is also sometimes called external beam radiotherapy (EBRT).

Radiotherapy uses high-energy x-rays to destroy cancer cells by preventing them from dividing and growing larger. Although normal cells in the treatment area are also affected by the radiation, they can repair themselves better than the cancer cells.

External beam radiotherapy is where a machine produces beams of radiation targeted at the cancerous area. These beams travel through your body to destroy the cancer cells and are stronger than those used for taking x-rays.

Internal radiotherapy is where solid radioactive material (material that gives off radiation) is placed in your body to destroy the cancer cells. It is placed within or near your cancer, as the radiation does not travel very far.

What is brachytherapy?

Prostate brachytherapy is a form of internal radiotherapy for cancer that has not spread outside of your prostate gland (localised cancer). It involves implanting (inserting) 'seeds' or pellets of radioactive material directly into your prostate gland under a general or spinal anaesthetic. These 'seeds' are about the size of a grain of rice and, using ultrasound for guidance, are implanted with a long, thin, hollow needle (see image below).

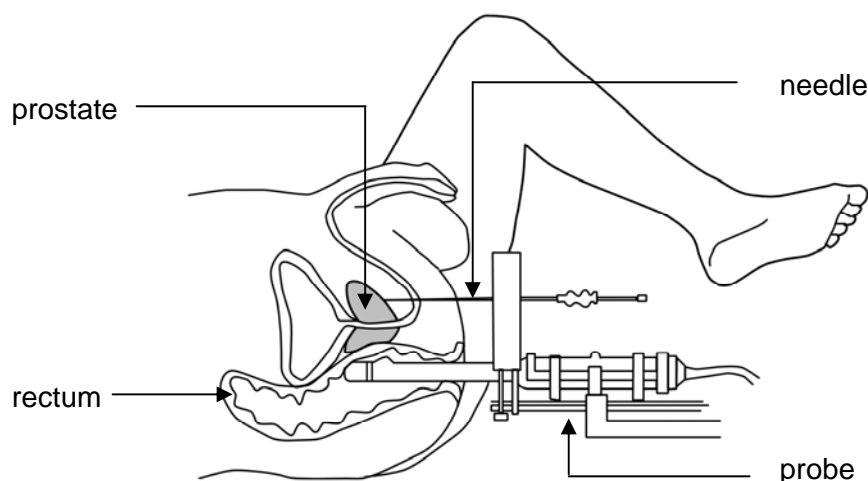


Image supplied by the Prostate Cancer UK

Brachytherapy is an established procedure for treating prostate cancer and is recognised as an alternative to traditional, external beam radiotherapy. It has been available in the UK for a number of years and several other centres now offer this treatment.

However, our service uses the most modern treatment approach, in which both the planning stage of the procedure and the inserting of the radioactive seeds itself is done in one visit. Most other centres do these separately, needing two hospital visits and anaesthetics.

What is combination treatment?

Combination treatment is a treatment that combines a five-week course of external beam radiotherapy with a brachytherapy boost four to six weeks after the completion of your course of radiotherapy.

What are the benefits of combination treatment?

- By combining traditional radiotherapy with a brachytherapy boost we can treat more aggressive and more extensive cancers with a higher dose of radiation.
- You can return to your usual everyday activities much quicker than with surgery to remove your prostate.
- Because the brachytherapy radioactivity only travels a few millimetres to kill nearby cancer cells, a higher dose of radiation can be given compared to external beam radiotherapy on its own.
- Long-term follow-up at 10 years has shown that brachytherapy as a boost to external beam radiotherapy is very effective in treating intermediate and high-risk prostate cancer unsuitable for brachytherapy alone. It is as effective as external beam radiotherapy alone and radical surgery to remove the prostate (prostatectomy).
- Similar to external beam radiotherapy, 40 out of 100 men experience erectile dysfunction (problems getting or maintaining an erection), compared to almost all patients who have a radical prostatectomy.
- About 20 to 30 out of 100 patients experience some urgency to pass urine for up to three months after brachytherapy.
- The risk of acute radiation proctitis (pain or inflammation of the back passage) occurs in one out of 100 patients undergoing combination therapy compared to between five and 10 patients who have had external beam radiotherapy alone. Many years after the treatment, 10 out of 100 men may experience a change in their bowel habits, and radiation proctitis is very rarely seen.

What are the alternatives?

Combination treatment is just one of the available options to treat localised prostate cancer. Your doctor will discuss with you any other treatments that are appropriate for your grade and extent of cancer. These include:

- **external beam radiotherapy** where beams of radiation are used to destroy the cancer cells.
- **open radical prostatectomy**, which is surgery to remove your prostate through an incision (cut) in your abdomen. For more information, please ask for a copy of our leaflet, **Removing your prostate to treat your prostate cancer – an open radical retropubic prostatectomy**.

- **robotic radical prostatectomy**, which is surgery to remove your prostate using robotic instruments and several keyholes. For more information, please ask for a copy of our leaflet, **Removing your prostate to treat your prostate cancer – a robotic-assisted laparoscopic prostatectomy**.
- **hormone therapy alone** which uses hormone injections or tablets that decrease your testosterone, thus starving the cancer.
- **watchful waiting** which includes observation of your PSA levels, usually by your GP.

How does combination treatment compare to other treatments?

Recently published data has suggested that combination treatment may be better in treating more aggressive and more extensive prostate cancers.

You will already have had a PSA (prostate-specific antigen) blood test to help diagnose your cancer. PSA tests are also used to monitor the effectiveness of any treatment you receive. American studies have shown that 85 out of 100 men had no rise in their PSA in the ten years following combination treatment. These results mirror studies of patients who have surgery to remove the prostate.

As with any form of radiotherapy to the prostate, you are at risk of incontinence and impotence or sexual dysfunction. However, studies have shown that the risks of these two side effects are lower for combination treatment than for surgery. Also, unlike other treatments, combination treatment does not affect your fertility or ability to ejaculate.

There are no clear long-term disadvantages to combination treatment in comparison to external beam radiotherapy on its own. The short-term side effects of lower urinary tract symptoms, such as urgency to urinate, frequency (the need to pass urine often) and discomfort when urinating, are more common with this type of treatment than with external beam radiotherapy on its own. This is due to the radiation, which is released over a period of months by the radioactive seeds.

What are the risks?

Your consultant will discuss the following possible complications with you in more detail:

- **Urinary frequency and urgency.** These symptoms are mild in 80 out of 100 and moderately severe in 20 out of 100 patients. The symptoms usually peak six to 12 weeks after brachytherapy and improve after this time. They can be controlled by drinking plenty of clear fluids, and avoiding caffeine and alcohol. We can also give you medicine if needed to improve your urine flow and reduce irritation to your urethra (tube through which you pass urine). These symptoms should resolve within six months of your implant.
- **Urinary retention** (the inability to pass urine). This is unusual, but can occur particularly if your prostate is large and swells further after treatment. If we think you are at risk, we will discuss the options for managing this with you before your treatment.
- **Erectile dysfunction.** About 40 out of 100 patients may have a temporary reduction in the quality of their erections (for around twelve months). This can be easily helped by medicine if needed. In the longer-term (several years), there may be a further reduction in erectile function, but this can also be helped by medicines. Compared to radical surgery, erectile function is much better maintained with combination treatment.

- **Fertility.** Although other radical treatments will usually leave you sterile, this is not the case after combination treatment. If your partner is of childbearing age, she should be aware of this fact. Because the seeds remain radioactive for about a year after implantation, we recommend that you and your partner use contraception for a year after your treatment to avoid pregnancy.
- **Rectal bleeding or proctitis** (pain and inflammation of the back passage). This may happen in one out of 100 patients. If you have rectal bleeding, you must contact us so that we can advise you what to do.
- **Bowel irritation.** This can occur as late as two to three years after brachytherapy, but medicines can often treat this. If your GP refers you to a bowel specialist, they must be told that you have had brachytherapy. They should speak to your consultant before you have any biopsies of your bowel, as this can lead to further problems.
- **Seed migration** (where the radioactive seeds are carried in the blood vessels to the lungs). You will not experience any specific symptoms if you have seed migration and it is generally picked up during investigations for other unrelated problems. Seed migration occurs in about one out of 100 patients when they first have their implant, and 30 out of 100 patients may experience some seed migration in the long-term. However, studies that have followed up patients with seed migration have not reported any long-term harmful effects.
- **General anaesthetic.** Risks associated with having a general anaesthetic are the same for brachytherapy as for other procedures performed under general anaesthetic. The complications and side effects of general anaesthetic are discussed in detail in our leaflet, **Having an anaesthetic**, which you should receive at your pre-assessment appointment. If you have not, please ask a member of staff for a copy.

What can I expect before I start my treatment?

Combination treatment is split into two separate phases: your course of radiotherapy followed by your brachytherapy implant.

Planning your course of radiotherapy

Before you start your course of radiotherapy, it is important to plan your treatment. The area of the body which is treated is very precise so careful planning is needed to ensure that the treatment is given to the exact same spot each time. This is done by having a CT scan of your pelvis, which will take place in the Radiotherapy Department at St Thomas' Hospital. We will send you an appointment letter for this.

What should I expect when I come for my course of radiotherapy?

You will be sent an appointment list with your treatment machine, dates and times for all of your treatments. This will either be at Guy's or St Thomas' hospitals.

- **St Thomas' Hospital**
Clinical Oncology, Lower Ground Floor, Lambeth Wing for Elekta 1 and 4, **OR**
South Wing Radiotherapy, Ground Floor for Elekta 2 and 3
- **Guy's Hospital**
Radiotherapy, Basement, Borough Wing for Elekta 5 and 6

Your treatment will start about two weeks after your CT scan. The total dose of radiation you will receive is divided into smaller doses given daily – these are called fractions.

Treatment is usually given daily Monday to Friday, with a rest at the weekends. You will be in the treatment room for about twenty minutes each time you come.

What will happen during my external beam radiotherapy?

You will need to have an empty bowel and a full bladder for your treatment as this helps to move the position of the prostate gland slightly and reduce the side effects of treatment. There are water fountains in the waiting areas in the department if you need them.

The radiographers will move the couch and treatment machine into position. When you are correctly lined up with the machine, the radiographers will leave the room to switch the machine on.

There may be some music playing in the background and you might hear some noises from the machine. You will not feel anything – the treatment is painless.

After the first part of your treatment, the machine will be moved into position for the next area to be treated. The radiographers will move the machine around you from outside the room. Each area takes a few seconds to treat and you will have the same areas treated each day.

You will need to lie still during the treatment but you will be able to breathe normally. You will be alone in the room, but the radiographers will be watching you all the time on closed circuit television (CCT).

Each week you will be able to see either a doctor or a treatment review radiographer. If you have any problems with your treatment or experience any side effects, please tell the radiographers treating you so that they can arrange for you to be seen by a doctor if necessary. Please see our leaflet, **Radiotherapy to the prostate** for further details about this treatment.

What happens after my course of radiotherapy?

During your radiotherapy treatment, you will be sent an appointment for your pre-brachytherapy assessment. Your brachytherapy implant will take place about four weeks after your radiotherapy course has finished.

Planning your brachytherapy implant

Prostate assessment and symptom score

Before your brachytherapy, the size of your prostate has to be measured to estimate the number of brachytherapy seeds needed for the procedure. You may hear this assessment called a transrectal ultrasound.

Images from an ultrasound probe (rather like the one that was used during your biopsies) are taken to allow for the size and volume of your prostate to be carefully measured. If your prostate biopsy was carried out at Guy's and St Thomas', a prostate assessment will have been done at this time. If not, your prostate size and symptoms will be assessed a few weeks or months before the brachytherapy.

To make sure that your risk of urinary retention is low, we will also carry out:

- a prostate symptom score (questionnaire which helps us monitor how many urinary symptoms you have and how severe you think they are); and
- a flow rate (where you pass urine into a special machine that measures how strong your urine flow is).

Many centres are unable to carry out brachytherapy on large prostates (greater than 50 cubic centimetres or cc) and patients are given medicine to reduce the size of their prostate before treatment. We have found this unnecessary and have treated prostates up to 80cc in size. However, the risk of urinary symptoms and retention is greater if you have a large prostate. You may need to learn how to pass a small tube (catheter) into your bladder to drain off any excess urine as this will prevent you from needing to come into hospital if you can not pass urine properly at first.

If your prostate is too large, we may discuss alternative treatments with you. These may include hormone therapy for three months or an operation to core out the middle of your prostate to reduce its size. If you need to undergo one of these treatments, your prostate will be reassessed before your brachytherapy.

We will **give you a prescription for a type of medicine called an alpha blocker** (such as tamsulosin or alfuzosin), which you will need to start taking 48 hours before you come to hospital for your implant. This medicine helps to ease the flow of your urine over the coming months while your prostate is swollen from the implants. It will also help to reduce the risk of urinary retention.

If you do not receive a prescription, please contact your specialist nurse to organise this (contact details are at the end of this leaflet). You will need to continue taking this medicine until one of the doctors looking after you tells you otherwise – it may be up to 18 months after the implant. You will need to get repeat prescriptions from your GP.

We will give you a prescription for an enema to clear your bowels either on the morning of your procedure or the night before if you are travelling from some distance away. Your doctor/nurse will give you instructions on when you should use this.

You will also be given a prescription for an antibiotic (usually ciprofloxacin), which you should start taking on the evening of your implant to reduce the risk of urinary infection. Make sure that you have this prescription before you leave the hospital.

Pre-assessment clinic

You will need to attend a pre-assessment appointment before you have your treatment, during which we will assess your suitability for a spinal or general anaesthetic. A spinal anaesthetic is where your body is numbed below the waist, and a general anaesthetic is where you are put to sleep for the whole procedure. We will discuss this with you in more detail at your appointment.

We will also carry out a number of tests to make sure that your heart, lungs and kidneys are working properly. You may have a chest x-ray, ECG or electrocardiogram (recording of the electrical activity of your heart) and some blood tests. Your doctor will explain any further tests you may need.

Please let us know if you are taking any **antiplatelet medicines** (for example aspirin or clopidogrel) or any **medicines that thin the blood** (for example warfarin, rivaroxaban, dabigatran or apixaban), as these may need to be withheld temporarily before the procedure. If you have diabetes, you may need to alter the dose of your diabetes medicines around the time of your procedure. We will give you specific advice on any changes required to your usual medicines during your pre-admission appointment – it is important that you continue to take them as normal unless you have been advised otherwise. Please remember to bring all of your medicines with you to the pre-assessment clinic and on the day of your procedure.

If you smoke, you may be asked to stop smoking as this increases the risk of developing a chest infection or deep vein thrombosis (DVT) which is a blood clot in a deep vein. Smoking can also delay wound healing because it reduces the amount of oxygen that reaches the tissues in your body. If you would like to give up smoking, please speak to your nurse or call the NHS Smoking Helpline on 0300 123 1044.

You must not eat or drink anything for at least six hours before the procedure is carried out. You will be given further instructions about fasting at the pre-assessment appointment and more information is also available in our leaflet, **Having an anaesthetic. If you do not follow the fasting instructions, your procedure may have to be cancelled.**

The brachytherapy procedure

The procedure itself takes between one and a half and two hours. In the technique used at Guy's and St Thomas', between 40 and 120 radioactive seeds are placed inside the prostate. These gradually release their radiation dose over a few months.

Once you are anaesthetised, the doctor will insert an ultrasound probe into your rectum to help them see where the needles are to be placed. When your doctor can clearly see your prostate on the ultrasound, they insert needles into your prostate through your perineum (the area of skin beneath your scrotum). Once the needles have been positioned, the doctor will make careful measurements of your prostate, and use a computer to determine the exact placing and number of seeds. The seeds are then inserted into your prostate through these needles. Implanting the seeds will take about 45 minutes to an hour.

The seeds will be permanently left in your prostate, although they will have released 95% of their radiation a year after being implanted. Your doctor will carefully work out the dose of radiation you are given so that the size and shape of your prostate is covered by the radiation, as well as a small area of surrounding tissue. We will reduce unnecessary radiation to your bladder, bowel and urethra as much as possible.

Who will carry out the brachytherapy procedure?

This procedure is currently carried out by Mr Popert, Mr Challacombe, Dr Beaney and Dr Morris who have all undergone specialist training in this procedure with experts in America and Europe.

After your implant

After the seeds have been implanted, you will be taken to the recovery room. You will stay there until you awake from the anaesthetic, which usually takes about an hour. After this, you will be taken back to your ward or day surgery unit.

When you wake up, you will have a drip (a bag of fluid connected to a small tube in a vein in your arm) to keep you well hydrated until you are able to have fluids. Passing urine may be a little uncomfortable at first. If you have problems with this, you may need a catheter inserted to drain your urine. However, this is rare and usually needed in about one out of 10 patients.

If you are coming in as a day surgery patient you will need a relative or friend to take you home afterwards. If you are staying on the ward and your friends and family members come to visit you in hospital, they can wait in the ward day room until you are back on the ward. You will stay on the ward with other patients, which shows just how safe the radiation levels are.

Special precautions you will need to follow because of the radiation:

- **Please do not allow any young children to sit on your lap, and do not cuddle them or anyone who is pregnant.** This is because young children and foetuses (babies before they are born) are more vulnerable to even low levels of radiation and it could impact on their development. For this reason, we recommend that you avoid close contact (less than 0.5m) with young children and pregnant women for the first two months after the implant.
- **You must wear a condom during sex for two months after the implant due to the very small risk of passing a seed.**

Please speak to your nurse specialist if you have any questions or concerns regarding these precautions.

Your consultant or a member of their team will come to see you after you have returned to the ward and your nurse has settled you in. You may be a little sore following the procedure but you should not be in a lot of pain. If you are, please let us know so that we can give you painkillers to relieve this, such as paracetamol or ibuprofen. You will be able to take them as soon as you are able to eat and drink, which is usually within an hour of returning to the ward.

What do I need to do after I go home?

You should be able to leave hospital within 12 hours of the procedure.

Before leaving the hospital, you will be given a Radionuclide Instruction card, which is about the size of a credit card. The card has details of who to contact in an emergency and information on the special radiation precautions you should follow after your implant. You should keep the card with you at all times, especially if you are travelling abroad. This is because the implants can set off security alarms in airports in much the same way as hip/knee replacements and pacemakers.

You will be given a one-week course of antibiotics which you will need to start on the evening of your implant. You must complete the course as it will reduce the risk of urinary infection.

Your nurses will also give you a set of reminder instructions when you leave the hospital. If you have any questions between your implant and follow-up appointment, please contact one of the prostate cancer nurses – contact details are at the end of this leaflet.

When you go home, please drink two to three litres of clear fluids each day but avoid caffeine (tea or coffee) or fizzy drinks.

You should be able to return to normal activities within about three days. Please take things gently at first and build up your activities slowly. You should be able to go back to work about five days after the implant.

Is there anything I need to look out for?

You may experience the following symptoms in the first two to three days:

- discomfort around your bottom when you sit down
- blood-stained urine
- bruising under your scrotum
- difficulty passing urine – needing to pass urine frequently and having to rush to the toilet to pass urine.

Please let us know if you have problems passing urine as you may need additional treatment for a few days, such as a catheter to drain your urine. These symptoms should get better with time.

Four to eight weeks after your implant, you might have:

- pain when you ejaculate, less forceful ejaculation or a reduced amount of ejaculate. This is related to the alpha blocker medicine and the effect of the radiotherapy.
- urinary frequency (going many times to pass small amounts of urine).
- pain when passing urine (this is the most common time to experience this).
- complete loss of erections. This is rare, but if it does happen, there is a variety of treatments to help, which we can discuss with you.

If you continue to have problems around eight weeks after your implant, you may need further treatment from your specialist.

When will I have a follow-up appointment?

You will have a CT scan of your prostate four to six weeks after having your implant to check the positioning of the seeds. This is part of a quality control assessment to check the implant quality and compare this to the assessment made at the time of the procedure. It is not used to see whether the cancer has gone.

You will then be seen by the consultant oncologist or one of his team a few weeks after your scan. Your appointment will be combined with an assessment of your urinary and erectile function, as part of our ongoing follow-up work.

Testing your PSA

You will have your first PSA test two to four months after the implant, and again six to eight months after implantation.

We expect your PSA to fall in the months following the implant. However, you should be aware that for some patients, their PSA rises 12 to 18 months after the implant and then starts to fall again. This is called 'PSA bounce'. It is not a sign of treatment failure and is more common in patients under 70 and those with larger prostates. PSA bounce occurs in up to 30 out of 100 patients, but this has not been shown to have any negative impact on the treatment outcome.

Further information

Dimbleby Cancer Care is the cancer support service for Guy's and St Thomas'. They have drop-in information centres, and also offer complementary therapies, psychological support and benefits advice.

Drop-in information centres are located at Guy's in Oncology Outpatients (Ground floor, Tabard Annexe) and at St Thomas' on the Lower Ground Floor, Lambeth Wing.

t: 020 7188 5918 e: RichardDimblebyCentre@gstt.nhs.uk

Prostate Cancer UK charity provides support and information for men with prostate cancer.

t: 0845 300 8383

w: www.prostatecanceruk.org

Macmillan Cancer Support provides information and support to anyone affected by cancer.

t: 0808 808 0000

w: www.macmillan.org.uk

Cancer Research UK provides information on all types of cancer and treatment options, as well as a book list for further information.

w: www.cancerresearchuk.org

UK Prostate Link provides links to quality assessed information about prostate cancer.

w: www.prostate-link.org.uk

Prostate Cancer Support Group at Guy's Hospital, Urology Centre, 1st Floor, Southwark Wing. Last Friday of every month, 2pm – 3.30pm.

Contact us

If you have any questions or concerns about **external beam radiotherapy**, please contact Phil Reynolds, advanced urology practitioner, on **020 7188 8244** (Monday to Friday, 8am to 5pm). You can also bleep Phil by calling the hospital switchboard on **020 7188 7188** and asking the operator to bleep **1947**.

If you have any questions or concerns about **brachytherapy**, please contact Janette Kinsella, prostate cancer advanced nurse practitioner, or Sharon Clovis, prostate nurse specialist, on **020 7188 7339** (Monday to Friday, 8am to 5pm). Alternatively, you can call the hospital switchboard on **020 7188 7188** and ask the operator to bleep **2393** for Janette Kinsella or **1005** for Sharon Clovis.

For more information leaflets on conditions, procedures, treatments and services offered at our hospitals, please visit www.guysandstthomas.nhs.uk/leaflets

Pharmacy Medicines Helpline

If you have any questions or concerns about your medicines, please speak to the staff caring for you or call our helpline.

t: 020 7188 8748 9am to 5pm, Monday to Friday

Patient Advice and Liaison Service (PALS)

To make comments or raise concerns about the Trust's services, please contact PALS. Ask a member of staff to direct you to the PALS office or:

e: 020 7188 8801 at St Thomas'

t: 020 7188 8803 at Guy's

e: pals@gstt.nhs.uk

Language Support Services

If you need an interpreter or information about your care in a different language or format, please get in touch using the following contact details.

t: 020 7188 8815 **fax:** 020 7188 5953

NHS 111

Offers medical help and advice from fully trained advisers supported by experienced nurses and paramedics. Available over the phone 24 hours a day.

t: 111

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