

# Prostate Cancer

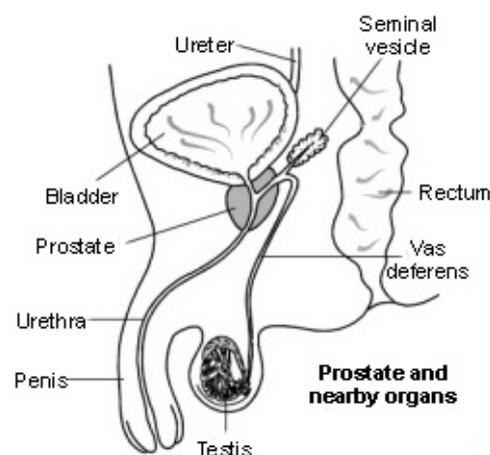
Most cases of prostate cancer develop in older men. In many cases the cancer is slow-growing, does not reduce life expectancy, and may not need treatment. In some cases it is more aggressive, spreads to other parts of the body, and may benefit from treatment. In general, the more advanced the cancer (the more it has grown and spread), the less chance that treatment will be curative. However, treatment can often slow the progress of the cancer.

## What is the prostate gland?

The prostate gland (just called prostate from now on) is only found in men. It lies just beneath the bladder. It is normally about the size of a chestnut.

The urethra (the tube which passes urine from the bladder) runs through the middle of the prostate. The prostate's main function is to produce fluid which protects and enriches sperm.

The prostate often gets bigger (enlarges) gradually after the age of about 50. By the age of 70, about 8 in 10 men have an enlarged prostate. It is common for older men to have urinary symptoms caused by a benign (non-cancerous) enlargement of the prostate. Some men also develop prostate cancer.



## What is cancer?

Cancer is a disease of the cells in the body. The body is made up from millions of tiny cells. There are many different types of cell in the body, and there are many different types of cancer which arise from different types of cell. What all types of cancer have in common is that the cancer cells are abnormal and multiply out of control.

A malignant tumour is a lump or growth of tissue made up from cancer cells which continue to multiply. Malignant tumours invade into nearby tissues and organs, which can cause damage.

Malignant tumours may also spread to other parts of the body. This happens if some cells break off from the first (primary) tumour and are carried in the bloodstream or lymph channels to other parts of the body. These small groups of cells may then multiply to form secondary tumours (metastases) in one or more parts of the body. These secondary tumours may then grow, invade and damage nearby tissues, and spread again.

Some cancers are more serious than others, some are more easily treated than others (particularly if diagnosed at an early stage), and some have a better outlook (prognosis) than others.

So, cancer is not just one condition. In each case it is important to know exactly what type of cancer has developed, how large it has become, and whether it has spread. This will enable you to get reliable information on treatment options and outlook.

See separate leaflet called '*Cancer - What are Cancer and Tumours?*' for further details about cancer in general.

## What is prostate cancer?

Prostate cancer is a cancer which develops from cells in the prostate gland. It is the most common cancer in men in the UK. Each year, about 35,000 men are diagnosed with prostate cancer in the UK. It affects about 1 in 12 men in the UK at some point in their life. Most cases develop in men over the age of 65.

Prostate cancer is different to most other cancers because small areas of cancer within the prostate are actually very common, especially in older men. These may not grow or cause any problems for many years (if at all).

## What causes prostate cancer?

A cancerous tumour starts from one abnormal cell. The exact reason why a cell becomes cancerous is unclear. It is thought that something damages or alters certain genes in the cell. This makes the cell abnormal and multiply out of control.

Although the exact cause is unclear, certain risk factors increase the chance that prostate cancer may develop. These include:

- Ageing. Most cases occur in older men.
- Family history and genetic factors. If your father or brother had prostate cancer at a relatively early age (before they were 60) then you have an increased risk. Also, if the type of breast cancer which is linked to a faulty gene runs in your female relatives, then you are at increased risk of prostate cancer. These factors point towards a faulty gene which may occur in some men.
- Ethnic group. Prostate cancer is more common in African-Caribbean men and less common in Asian men.
- Diet is possibly a risk factor. As with other cancers, a diet high in fats and low in fruit and vegetables may increase the risk.
- Exposure to the metal cadmium may be a risk.

## What are the symptoms of prostate cancer?

Prostate cancer is often slow-growing. There may be no symptoms at first, even for years. As the tumour grows, it may press on and irritate the urethra, or cause a partial blockage to the flow of urine. Symptoms may then develop and can include one or more of the following:

- **Poor stream.** The flow of urine is weaker, and it takes longer to empty your bladder.
- **Hesitancy.** You may have to wait at the toilet for a while before urine starts to flow.
- **Dribbling.** A bit more urine may trickle out and stain your underpants soon after you finish at the toilet.
- **Frequency.** You may pass urine more often than normal.
- **Urgency.** You may have to get to the toilet quickly.
- **Poor emptying.** You may have a feeling of not quite emptying your bladder.

**Note:** all the above symptoms are common in older men. Most men who develop the above symptoms do **not** have prostate cancer but have a benign (non-cancerous) enlargement of the prostate. However, it is best to get any new symptoms checked out by a doctor.

Other symptoms such as pain at the base of the penis or passing blood occasionally occur. (These do not occur with benign prostate enlargement.)

If the cancer spreads to other parts of the body, various other symptoms can develop. The most common site for the cancer to spread is to one or more bones, especially the pelvis, lower spine and hips. Affected bones can become painful and tender. Sometimes the first symptoms to develop are from secondary tumours in bones.

## How is prostate cancer diagnosed?

### Initial assessment

If a doctor suspects that you may have prostate cancer, he or she will usually:

- Examine the prostate gland. They do this by inserting a gloved finger through the anus into the rectum to feel the back of the prostate gland. An enlarged-feeling gland, particularly if it is not smooth to feel, may indicate prostate cancer. However, a normal-feeling prostate does not rule out prostate cancer.

- Do a blood test to measure the level of prostate specific antigen (PSA). PSA is a chemical which is made by both normal and cancerous prostate cells. Basically, the higher the level of PSA, the more likely that you have cancer of the prostate. However, a mild-to-moderately raised PSA can occur in conditions other than prostate cancer. (If you have confirmed prostate cancer, the PSA blood test is also used to monitor treatment. If treatment is working and cancer cells are killed then the level of PSA falls.)
- A PCA3 test may be offered. This is a new urine test which provides a more effective means of detecting prostate cancer than the PSA test. PCA3 is a chemical made particularly by prostate cancer cells. Up to 100 times more PCA3 is present in prostate cancer cells than non-cancerous cells. A certain level of PCA3 in the urine is a good indication that prostate cancer is present. This test is combined with a rectal examination. A normal-feeling prostate combined with a negative PCA3 test can be reassuring and may help avoid the need for prostate biopsies. However, it is not yet available in all clinics in the UK.

## Biopsy - to confirm the diagnosis

A biopsy is when a small sample of tissue is removed from a part of the body. The sample is then examined under the microscope to look for abnormal cells. A biopsy can usually confirm the presence of prostate cancer.

A biopsy is not always necessary to confirm a diagnosis of prostate cancer. Your doctor will be able to discuss the reasons for you to have a biopsy, if appropriate, with you in more detail.

A small biopsy of the prostate is taken by using a fine needle. This is usually done with the aid of a special ultrasound scanner. The probe of the scanner is about the size and shape of a finger. It is passed through the anus into the rectum to lie behind the prostate. This finds the exact position of the prostate. The doctor then pushes a fine needle into the back of the prostate from within the rectum to obtain the biopsy. Several samples are usually taken from different parts of the prostate.

Having a prostate biopsy can be uncomfortable. Therefore, local anaesthetic is used to reduce the pain as much as possible.

## Assessing the severity and spread of prostate cancer

The severity of the disease is mainly based on three factors - the grade of the cancer cells, the stage of the cancer, and the blood PSA level.

### Grade of the cancer

Biopsy samples are looked at under the microscope to assess the cancer cells. By looking at certain features of the cells, the cancer can be graded. The common grading system used is called the Gleason Score.

A Gleason score of between 2 and 6 is a low-grade prostate cancer. It is likely to grow very slowly. A Gleason score of 7 is an intermediate grade that will grow at a moderate rate. A Gleason score of 8 to 10 is a high-grade cancer that is likely to grow more quickly.

### Staging

If you are confirmed to have prostate cancer, further tests may be advised to assess if it has spread. These tests are not advised in all cases. It depends on factors such as your age and the grade of the tumour cells. Tests which may be done include a bone scan, a CT scan, an MRI scan, an abdominal ultrasound scan or other tests. See separate leaflets called '*Bone Scan*', '*CT Scan*', '*MRI Scan*' and '*Ultrasound Scan*' for details of these tests. This assessment is called staging of the cancer. The aim of staging is to find out:

- How much the tumour has grown, and whether it has grown through the wall of the prostate and into nearby structures such as the bladder wall.
- Whether the cancer has spread to local lymph nodes.
- Whether the cancer has spread to other areas of the body (metastasised).

See separate leaflet called '*Cancer - Staging and Grading Cancer*' for further details.

## What are the treatment options for prostate cancer?

The treatment of prostate cancer is complicated. It varies tremendously between different cases. In addition, different men may choose to have different treatments compared to others with a similar type of prostate cancer.

Treatment options which may be considered include: surgery, radiotherapy, hormone treatment and, less commonly, chemotherapy. Often a combination of two or more of these treatments is used. The treatments used depend on:

- the cancer itself - its size and stage (whether it has spread), the grade of the cancer cells, the PSA level; AND
- the man with the cancer - your age, your general health and also personal preferences for treatment.

For example, certain types of prostate cancer are confined to the prostate, are slow-growing and are unlikely to affect your life expectancy. Some types are more aggressive, more likely to spread and may cause serious illness and lead to death unless treated. The risks and possible side-effects of treatment are another consideration.

The treatment options are usually different for early prostate cancer that is confined to the prostate gland, local advanced prostate cancer, and late or advanced prostate cancer.

You should have a full discussion with a specialist who knows your case. They will be able to give the pros and cons, likely success rate, possible side-effects, and other details about the various possible treatment options for your type of cancer.

You should also discuss with your specialist the aims of treatment. For example:

- Treatment may aim to cure the cancer. In particular, the earlier the stage of the cancer, the better the chance of a cure. (Doctors tend to use the word remission rather than the word cured. Remission means there is no evidence of cancer following treatment. If you are in remission, you may be cured. However, in some cases a cancer returns months or years later. This is why doctors are sometimes reluctant to use the word cured.)
- Treatment may aim to control the cancer. If a cure is not realistic, with treatment it is often possible to limit the growth or spread of the cancer so that it progresses less rapidly. This may keep you free of symptoms for some time.
- Treatment may aim to ease symptoms. Even if a cure is not possible, treatments may be used to reduce the size of a cancer, which may ease symptoms such as pain. If a cancer is advanced then you may require treatments such as nutritional supplements, painkillers, or other techniques to help keep you free of pain or other symptoms.

The following is an overview of treatment options which you may have after discussion with your doctor.

## Treatment options for early prostate cancer

### Active surveillance

Many prostate cancers are diagnosed at an early stage by PSA testing. Prostate cancer is often very slow-growing and, for many men with prostate cancer, the disease may never progress or cause any symptoms. In other words, many men with prostate cancer will never need any treatment. Treatments for prostate cancer can cause side-effects, which can affect your lifestyle. By monitoring the cancer with active surveillance, you can avoid or delay the side-effects of treatment.

Active surveillance aims to find those cancers that are likely to grow and cause symptoms if they are not treated. These cancers can then be treated at an early stage.

Active surveillance may be suitable if you have low- to medium-risk prostate cancer. It will involve regular check-ups with PSA tests, rectal examination of the prostate and possibly repeat prostate biopsies.

### Surgery

Removing the prostate (radical prostatectomy) can be curative if the cancer is in an early stage (confined to the prostate and not spread). It is a major operation and so tends to be advised more often for younger men whose general health is good, especially if the cancer grade means the cancer is likely to spread in the future. Side-effects such as impotence and/or incontinence of urine may occur following a prostatectomy.

## Radiotherapy

Radiotherapy is a treatment which uses high-energy beams of radiation which are focused on cancerous tissue. This kills cancer cells, or stops cancer cells from multiplying. See separate leaflet called '*Radiotherapy*' for more details.

Radical radiotherapy may be used as an alternative to surgery. Two types of radiotherapy are used for prostate cancer - external and internal. Again, the type chosen depends on various factors such as the size, grade and stage of cancer.

Radiotherapy is often more suitable for men who are not fit enough to have an operation or choose not to have an operation.

- External radiotherapy. This is where radiation is targeted on the prostate cancer from a machine. (This is a common type of radiotherapy used for many types of cancer.)
- Internal radiotherapy (brachytherapy). This treatment involves inserting a small radioactive implant into the cancerous tumour, or next to the tumour. Sometimes radioactive seeds are placed into the prostate gland. The seeds are left in place permanently but lose their radioactivity over time. Sometimes a larger radioactive implant is inserted into the prostate for a short time and then removed. External radiotherapy may be also given with this type of brachytherapy.

## Treatment options for locally advanced prostate cancer

When the cancer has spread into the capsule of the prostate or into the surrounding tissues near to the prostate then it is called locally advanced prostate cancer.

You may be offered hormone treatment with radiotherapy. The radiotherapy given is usually similar to that given for men with early prostate cancer although the radiotherapy may include the surrounding structures in addition to the prostate. Some men just receive hormone treatment. As the choice of treatment depends on many factors, your doctor will discuss the treatment with you in more detail.

### Hormone treatment

Prostate cancer cells need the male hormone called testosterone to grow and multiply well. Testosterone is made in the testes and circulates in the bloodstream. Hormone treatments aim to stop you from making testosterone or to block the effect of testosterone on prostate cancer cells. Hormone treatments do not cure prostate cancer but may greatly slow down the growth of the cancer for a number of years.

Two groups of medicines are available:

- Medicines which work on the pituitary gland. For example: goserelin and leuprorelin. (Your pituitary gland makes a hormone which circulates in the bloodstream to stimulate the testes to make testosterone. These medicines stop your pituitary from making this stimulating hormone.) These medicines are given by an injection.
- Medicines which block the action of testosterone (anti-androgen medicines). For example: flutamide and cyproterone acetate. These medicines are tablets.

Hormone treatments can cause side-effects such as erectile dysfunction (impotence), hot flushes, sweating and other problems.

## Treatment options for late or advanced prostate cancer

Late or advanced prostate cancer is when the cancer has spread to other parts of the body. Hormone treatments are usually given, as the cancer cells in other parts of the body still need testosterone to grow and multiply.

Another type of hormone treatment which may be offered is surgical removal of the testes (orchidectomy). Without testes you no longer make testosterone.

You may decide not to start hormone treatment until you develop symptoms. Your doctor will be able to discuss the timings of treatments with you in more detail.

## Chemotherapy

Chemotherapy is a treatment of cancer by using anti-cancer medicines which kill cancer cells, or stop them from multiplying. See separate leaflet called '*Chemotherapy*' for more details. Chemotherapy is not commonly used for the treatment of prostate cancer. It may be used for more advanced cancers.

## Radiotherapy

Even if the cancer is advanced and a cure is not possible, radiotherapy may have a place to ease symptoms. For example, radiotherapy may be used to shrink secondary tumours which have spread to bones and are causing pain. Brachytherapy (a form of radiotherapy in which radiation is targeted directly at the prostate gland) in combination with external-beam radiotherapy is a treatment option for localised prostate cancer.

## Watchful waiting

In some cases it may be best not to have any active treatment but to see how the cancer develops. This is called watchful waiting. Various factors are taken into account such as the stage of the cancer, your age, general health, the impact and the potential side-effects if treatment were to be used. Watchful waiting may be more appropriate for men where the cancer is not causing much in the way of symptoms, and is slow-growing, especially in older men. With a watchful waiting approach you will still have regular check-ups and the decision about treatment can be reviewed at any time.

## Newer treatments

Cryotherapy (also known as cryosurgery) is an alternative treatment for men with early prostate cancer and recurrent prostate cancer. It is not yet available in all hospitals in the UK. It involves placing a number of metal probes through the skin and into the affected area of the prostate gland. The probes contain liquid nitrogen, which freezes and destroys the cancer cells.

High-intensity focused ultrasound (HIFU) treatment may be offered to some men, again with early prostate cancer. As this is still a relatively new procedure, it is not yet available in all hospitals in the UK. HIFU involves inserting a probe into the rectum. It is then pushed through the wall of the bowel into the prostate gland. The probe produces a high-energy beam of ultrasound which then heats and destroys the cancer. The probe is surrounded by a cooling balloon to protect the normal prostate tissue from damage.

## What is the prognosis (outlook)?

The outlook for prostate cancer is very variable. Some prostate cancers are slow-growing and do not affect life expectancy. On the other hand, some have already spread to other parts of the body when they are diagnosed. The response to treatment is also variable.

The treatment of cancer is a developing area of medicine. New treatments continue to be developed and the information on outlook above is very general. The specialist who knows your case can give more accurate information about your particular outlook, and how well your type and stage of cancer are likely to respond to treatment.

## Screening for prostate cancer

Screening for prostate cancer is controversial. A routine blood test which shows a high PSA *may* indicate that you have prostate cancer. However, there are other causes of a high PSA. Also, many prostate cancers are slow-growing and do not cause problems, particularly in older men. Some experts believe that if all men were screened then there may be many men found with a raised PSA level. Many men may then be investigated and treated unnecessarily with all the possible risks and side-effects of the investigations and treatment. Put simply, some people believe that screening for all men may do more harm than good.

Currently there is no national screening programme in the UK. However, you can decide for yourself if you would like a PSA test. It is best to discuss the pros and cons of the test with your GP. After counselling, if you decide that you would like the test, many GPs will do the test on request. See separate leaflet called '*PSA Testing for Prostate Cancer*' for further details on the PSA screening test.

## Further help and information

### The Prostate Cancer Charity

Helpline: 0845 300 8383 Web: [www.prostate-cancer.org.uk](http://www.prostate-cancer.org.uk)  
Provides support and information for patients and their families.

### Prostate Cancer Support Association

Helpline: 0845 6010766 Web: [www.prostatecancersupport.info](http://www.prostatecancersupport.info)  
Provides support and information for patients and their families.

### Prostate Action

Tel: 020 8788 7720 Web: [www.prostateaction.org.uk](http://www.prostateaction.org.uk)  
A national charity dealing with all prostate diseases, including prostate cancer.

### Macmillan Cancer Support

Tel: 0808 800 1234 Web: [www.macmillan.org.uk](http://www.macmillan.org.uk)  
Provides information and support to anyone affected by cancer.

### CancerHelp UK

Web: <http://cancerhelp.cancerresearchuk.org/> provides facts about cancer, including treatment choices.

### The NHS Prostate Cancer Risk Management Programme

Web: [www.cancerscreening.nhs.uk/prostate/index.html](http://www.cancerscreening.nhs.uk/prostate/index.html)  
Provides information as to why there is no organised screening programme for prostate cancer but an informed choice programme instead.

### Other support groups

See [www.patient.co.uk/selfhelp.asp](http://www.patient.co.uk/selfhelp.asp) for a list of support groups for cancer patients.

## Further reading & references

- [Cryotherapy as a primary treatment for prostate cancer](#), NICE Technology Appraisal (2005)
- [Low dose rate brachytherapy for prostate cancer](#), NICE (2005)
- [Cryotherapy for recurrent prostate cancer](#), NICE Technology Appraisal (2005)
- [High-intensity focused ultrasound for prostate cancer](#), NICE Technology Appraisal (2005)
- [High dose rate brachytherapy for prostate cancer](#), NICE (2006)
- [Prostate cancer](#), NICE Clinical Guideline (February 2008)
- [Guidelines on Prostate Cancer](#), European Association of Urology (2011)
- [Crawford ED](#); Understanding the epidemiology, natural history, and key pathways involved in prostate cancer. *Urology*. 2009 May;73(5 Suppl):S4-10.
- [Kirby RS, Fitzpatrick JM, Irani J](#); Prostate cancer diagnosis in the new millennium: strengths and weaknesses of prostate-specific antigen and the discovery and clinical evaluation of prostate cancer gene 3 (PCA3). *BJU Int*. 2009 Feb;103(4):441-5. Epub 2009 Jan 9.

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