

Edith Cavell Hospital Department of Urology



The Diagnosis of Prostate Cancer

What is Prostate Cancer?

Prostate Cancer is a condition of the prostate in which there is abnormal growth of prostate cells.

The growth is uncontrolled (compared to growth of *normal* prostate tissue) and the cancer cells have a tendency to spread (known as “metastasise”) outside the confines of the tissue to involve other parts of the body

How do we detect Prostate Cancer?

Many of the men who we see in the Urology Clinics have been referred because of one of three reasons

- For investigation of troublesome symptoms with urination
- As a result of an examination by the GP there appears to be an abnormal feel to the patient’s prostate
- As a result of tests which the GP has arranged there appears to be an abnormally high result to what is know as the PSA test (see below)

In there early stages of prostate cancer there are no particular symptoms that may signal the fact that cancer is present. Sometimes prostate cancer is only detected following a prostate operation - the tissue removed at operation is always sent for pathological examination.

Studies have shown that 10% of men undergoing a prostate operation (known as a trans-urethral resection of the prostate, or TURP) for urinary symptoms will subsequently be shown to have a small area of cancer within the tissues removed.

- If the patient has difficulties passing urine these will be investigated on their own merits. This is not discussed further here.

- If the GP has indicated that the patient's prostate feels abnormal or the PSA test is high then the Urologist will wish to confirm this

Prostate cancer sometimes produces a “nodularity” or “firmness” to the prostate that can make its presence known on a digital rectal examination (DRE) of the prostate. The problem is that other inflammations of the prostate that are not cancers can produce similar abnormalities and this can confuse the issue. Furthermore a number of prostate tumours occur within the front part of the prostate on the other side from the rectum. These tumours cannot be felt by DRE.

Examination of the prostate through the rectum, or digital rectal examination (DRE), has an accuracy of approximately 30 and 50 %. This means that it correctly predicts whether there is or is not a tumour of the prostate in only 30-50 % of cases. In effect, DRE is of limited use on its own, and is not a particularly good test for deciding whether a man has got prostate cancer or not.

What other ways do we have of improving this situation?

The Prostate Specific Antigen (PSA) test - what is it?

Prostate Specific Antigen (PSA) is a chemical produced normally by prostate cells. It is a type of chemical known as an enzyme, and it is believed to have a role in liquefying semen after ejaculation (which may help in sperm motility).

PSA is only produced by prostate cells (it is prostate specific), but is produced by both cancerous and non-cancerous prostate cells (it is **not cancer specific**). Although PSA is the best example we have of a marker for prostate cancer this non-specificity for cancer means that there are reservations about the interpretation of raised values.

Essentially, one of the following scenarios may commonly occur

- A man **with** prostate cancer may **not** have a raised PSA test (this is known as a false-negative result)
- A man **with** a raised PSA may **not** have prostate cancer (this is known as false-positive result)

The recent introduction of age-specific ranges for normal PSA values was an attempt to make the PSA test a better one. Rather than use the absolute limit of more than 4 ng/ml most urologists now use the following values

Age	Reference Range
40-49	< 2.5 ng/ml
50-59	< 3.5 ng/ml
60-69	< 4.5 ng/ml
70-79	< 6.5 ng/ml

As with DRE, the use of PSA by itself is not particularly accurate.

What are the chances that I may have prostate cancer?

The tables below (taken from the European Association of Urology guidelines) indicate the **percentage risk** of having cancer according to

a) whether the PSA alone is abnormal

PSA (ng/mL)	Probability of prostate cancer (%)
0-2.4	Not known
2.5-4	12-23
4.1-10	25
> 10.0	> 50

PSA = prostate-specific antigen.

b) whether the PSA and DRE taken together are abnormal or otherwise

Age

<50 | 51-60 | 61-70 | 71-80

PSA (ng/mL)	DRE -	DRE +						
< 2.5	9	37	12	39	15	42	20	44
2.6-4.0	9	41	12	42	16	44	20	47
4.1-6.0	10	41	14	44	17	47	22	48
6.1-10.0	11	-	15	48	19	50	25	42
10.1-20.0	13	55	19	54	25	58	31	60
> 20.0	22	82	45	74	43	81	59	84

DRE = digital rectal examination; PSA = prostate-specific antigen.

Data from Potter et al. Urology **57**: 1100-1104, 2001 ("DRE-" means normal DRE, "DRE+" means abnormal DRE)

Current recommendations for Further Investigations

The current recommendations for further investigations are that if either the DRE is abnormal, or the PSA test is raised above the age adjusted limit then further investigations should be performed.

Should I have a PSA test, and what will it mean?

Unless you have symptoms of difficulty passing urine, an abnormal-feeling prostate gland, or a strong family history of prostate cancer it is unlikely that your doctor will recommend that you have a PSA test performed. This is partly because of the uncertainties mentioned in the section above.

There has been a case put forward for the *screening* of asymptomatic (without symptoms) men – i.e. looking for possible cancer in men who have absolutely no symptoms at all.

The arguments for this view can be summarised as follows:

- Advanced cancer which has spread beyond the prostate is not curable, so if there is any hope of curing a prostate cancer it must be detected whilst it remains confined to the prostate
- In a lot of men referred to the specialist and who are found to have prostate cancer it is already too late to offer a complete cure. Screening *might* detect the cancer at an earlier stage
- Tumours detected by PSA testing are now thought to be significant tumours which should be treated

Against this are the following points:

- There is no conclusive proof that treatment of tumours discovered by screening makes any difference to the survival of the patient treated
- Lots of men discovered to have prostate cancer are elderly and suffer from other serious illnesses. Many of these men will die from other causes not related to the prostate cancer

If a PSA test is performed and is normal this is not cast-iron proof that you do not have prostate cancer, and your doctor may still wish to perform further tests (a biopsy, see below) if your prostate feels abnormal. Equally if your PSA is raised this does not necessarily mean that you *do* have prostate cancer, although there is good evidence that the higher the value of PSA test result the more likely it is that cancer is present.

If you choose to have a PSA test done you should be prepared to undergo a prostate biopsy if the PSA value is sufficiently raised to justify this course of action.

Current UK guidelines recommend that doctors should not perform screening on men without symptoms

My PSA is raised and I need a biopsy. What happens now?

If either your prostate feels abnormal when the doctor feels it, or your PSA is raised (above the normal limit for your age) then your doctor might recommend taking **a prostate biopsy**.

This is performed on the ward as an outpatient procedure. It does not require an anaesthetic and you will be able to go home shortly after the procedure is completed.

Before the procedure begins the doctor will go through the procedure thoroughly with you and will explain again why it is being performed. He will then ask you to give your written consent to undergo the procedure. Following this the doctor will give you an intravenous injection of antibiotics to prevent infection being caused by the biopsy (see complications, below).

You will then be asked to lie on the examination couch while the doctor re-examines your prostate to assess it.

The doctor will then scan the prostate by inserting a small ultrasound probe into the rectum. You may be able to see the pictures of your prostate on the television screen.

The doctor will then insert the biopsy needle up the inside of the ultrasound probe as it lies in the rectum adjacent to the prostate.

The biopsy is then taken and as the needle is fired using a special device you may feel a momentary discomfort. It is our practice to take 6 or more individual biopsies from various regions of the prostate and the procedure usually takes no more than 5-10 minutes to complete.

After the procedure is finished you will be able to get dressed and make your way to the sitting area. We like to keep an eye on you for a while after the procedure to monitor for any complications. The most usual of these are:

- Bleeding from the back passage or in the urine
- Infection
- Difficulty passing urine

The bleeding usually settles spontaneously though we would ask you to drink plenty of fluids for the rest of the day to help flush out any blood clots which may form in the urine.

Complications after a prostate biopsy

- The complication rate after this form of biopsy is in the region of 24 in a thousand men undergoing the procedure.
- For every 1000 men undergoing the procedure approximately 8 would develop a fever (which might suggest an infection) and 4 would be unable to pass urine at all.
- In the latter case a catheter would need to be inserted to drain the bladder for a few days.
- The risk of infection is much reduced by the injection of antibiotics before the procedure. In addition we will give you antibiotic tablets to take home for a few days after the procedure

My biopsy was negative, what happens now?

This question is very difficult to answer accurately, **but the important thing to note is that a negative biopsy result cannot exclude completely the possibility of cancer within the prostate.** If the degree of cancer is very small it is difficult to hit it with the biopsy needle.

Our current practice is to keep you under review by regular visits to the outpatient department and to repeat the PSA at intervals. If the PSA continues to climb steadily upwards this would be further evidence of possible cancer and it might be necessary to repeat the biopsies. This would not be done within three months because the act of taking a biopsy from the prostate artificially raises the PSA level and this would confuse the issue.

If the PSA remains stable we would continue to monitor the situation. However the significance of a PSA which remains stable is unclear when it comes to excluding a cancer.

My biopsy was positive and I have prostate Cancer - what treatments are there?

- **This is a separate topic in itself and you will find the information provided in the leaflet entitled “The Treatment of Prostate Cancer”**

Any questions?

If you have any questions, jot them down here and ask the nursing or medical staff for answers.

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