

Prostate cancer

What is prostate cancer?

The prostate or prostate gland is about the size of a chestnut. It is located directly below the bladder and encircles the urethra. The principal function of the prostate is to produce some parts of the seminal fluid. This fluid is important for the motility of sperm, and therefore for fertility. Along with the testes, the prostate forms part of the male reproductive system.

Changes occur in the prostate in one in every two men after the age of 50. These may involve benign enlargement of the gland, known as benign prostatic hyperplasia. This begins at the point where the prostate gland encircles the urethra and as the disorder progresses the urethra is constricted. The flow of urine becomes weaker and the urge to urinate more frequent.

Unlike the malignant change – prostate cancer – the benign change in the gland does not extend beyond the prostate itself.

Prostate cancer is a malignant tumour. Prostate cancer tends to spread beyond its own confining capsule. Because the tumour usually in prostate areas distant from the urethra, the malignant change often goes unnoticed for a long time. Constriction of the urethra with problems on urination usually only occurs once the tumour is already large and has spread. The malignant tumour can often be palpated (felt) by the doctor in an examination via the rectum.

If the cancer has not spread beyond the prostate gland, a cure is possible with surgery or radiotherapy.

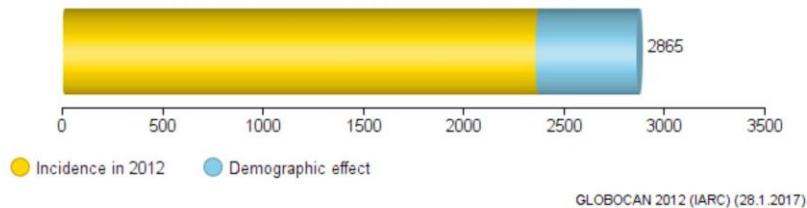
The average age on developing the disease is slightly over 70.

Egypt-Prostate cancer

Year	Estimated number of new cancers (all ages)	Male	Female	Both sexes
2012		2358	-	-
	ages < 65	505	-	-
	ages >= 65	1853	-	-
2020		2865	-	-
	ages < 65	600	-	-
	ages >= 65	2265	-	-
Demographic change		507	-	-
	ages < 65	95	-	-
	ages >= 65	412	-	-

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Population forecasts were extracted from the *United Nations, World Population prospects, the 2012 revision*. Numbers are computed using age-specific rates and corresponding populations for 10 age-groups.



What are the causes of and risk factors for developing prostate cancer or carcinoma of the prostate gland?

Risk factors for prostate cancer include advanced age, a genetic predisposition and hormones.

Risk factor: age

Age is the most important factor in prostate cancer. More than 80 per cent of all men in whom prostate cancer is diagnosed are over 60 years old. The likelihood of developing prostate cancer increases by a factor of up to forty between the ages of 50 and 85.

Risk factor: genetic predisposition

Prostate cancer is at least partially attributable to genetic predisposition. This predisposition can be inherited within a family.

Risk factor: hormones

Hormones are a fundamental factor in the development of the disease. No prostate cancer can develop without the male sex hormone, testosterone. Testosterone is necessary for the prostate to function but it also encourages the growth of prostate cancer cells.

What role does lifestyle play in prostate cancer?

Diet, lifestyle and possibly also working conditions can influence the development of prostate cancer. Factors that promote health are:

- Healthy weight
- Regular physical activity
- A balanced diet, principally vegetable-based
- Low alcohol consumption

How is prostate cancer diagnosed?

Preventive screening is particularly important for the early detection of prostate cancer because in the early stage of the disease patients have no typical symptoms. Only a doctor can establish by means of diagnostic procedures whether any prostate change is benign or malignant. The earlier prostate cancer is diagnosed, the better the chances of a complete recovery.

New early detection methods – such as PSA determination – pick up changes in the prostate, particularly in their early stages. This blood test determines the concentration of a protein that is formed only by the prostate. PSA stands for prostate-specific antigen. Elevated PSA calls for further investigations to explain the high level.

The doctor may take a **tissue sample** via the rectum to confirm the diagnosis. This is generally carried out in combination with a **transrectal** ultrasound examination.

Magnetic resonance imaging– MRI for short – in which cross-sectional images of the inside of the body are obtained without the use of radiation, is currently regarded as the best imaging procedure for detecting a tumour. In the case of suspected prostate cancer, MRI will be used to display areas suspected of being cancerous.

However, MRI is not a substitute for a biopsy. In specific cases, magnetic resonance imaging may help the doctor decide whether surgery is advisable and how radical this should be.

If bone metastases are suspected, **bone scintigraphy** will be carried out. To perform scintigraphy (a bone scan), a radioactive substance is injected into the bloodstream so that it is transported around the whole body in the bloodstream. The radioactive particles accumulate in diseased bone, and the accumulations are made visible by means of a special camera.

How is prostate cancer treated?

Once the diagnosis of prostate cancer has been confirmed and the size and stage of the tumour are also known, the doctor and patient will discuss the treatment options.

The following therapeutic procedures are available for prostate cancer:

- Surgery
- Radiotherapy
- Hormone therapy
- Chemotherapy
- Active surveillance
- Watchful waiting

In the case of early-stage tumours confined to the prostate, surgery and radiotherapy are available as treatment options. The prostate is removed completely in the operation.

The main objective is to remove the tumour tissue entirely so as to achieve a cure. The seminal vesicles are removed at the same time as the prostate and possibly also the lymph nodes in the pelvis. This prevents cancer cells from spreading via the lymphatic system.

Radiotherapy is a possible alternative to surgery. It is the treatment of choice if surgical intervention is not possible or desired. In radiotherapy, ionizing radiation targets the tumour directly. This damages the nuclei of the cancer cells so that the cancer cells are no longer able to divide, and they die. Two types of radiation are available. One is administered from outside the body and is known as percutaneous irradiation, the other is administered from inside the body and is known as brachytherapy.

If the cancer has not spread beyond the gland, a cure may be achieved with surgery or radiation.

If the tumour has already spread to neighbouring tissue and formed metastases in lymph nodes at the time of diagnosis, hormone **withdrawal therapy** will be chosen, which acts on the whole of the body. This therapy blocks the formation and action of the male sex hormone testosterone.

Alternatively, only the action of testosterone, and hence also its stimulating effect on prostate cancer cells, may be suppressed. With this **hormone block**, testosterone continues to be formed in

the body and so much of its largely positive influence on the male body is retained. This intervention in hormonal metabolism may bring tumour growth to a standstill for a fairly long period.

Chemotherapy involves the use of medicines – known as cytostatics – that stop the growth of cancer cells and so destroy them. The cytostatic drugs spread throughout the whole body and thus also reach cancer cells that have already migrated to other areas of the body. Although this treatment does not cure the cancer it may substantially delay the progress of the disease.

If the tumour has already formed bone metastases, **hormone withdrawal therapy and chemotherapy** are given in **combination with radiotherapy**. This provides pain relief and halts the spread of the cancer.

Patients whose cancer is not highly malignant have the option of initially opting for no treatment. “**Active surveillance**” involves regularly checks to see whether the tumour is growing at all. If tumour growth is found, treatment can be started immediately.

Elderly patients, for whom treatment would be too exhausting, may be offered “watchful waiting” as a treatment option. In this event, the patient is monitored on a long-term basis and if symptoms caused by the cancer appear, the symptoms will be treated, not the cancer itself.

Additional information: prostate cancer - classification of tumour type and tumour stage

The stage of prostate cancer is classified using the TNM system in the same way as other cancers. In the TNM system, T stands for Tumour, N for lymph Node and M for Metastases. According to the WHO, the stage of the cancer is defined as “T1-2” or “T3-4”. These stages describe the extent to which the cancer has spread within the prostate (see Table below).

Pathologists use another classification for prostate cancer based on the growth pattern. This produces the “Gleason score” with values between 2 and 10; the higher the value, the less good the prognosis.

T – Primary tumour	
TX	Primary tumour cannot be assessed
T0	No evidence of primary tumour
T1	Clinically inapparent tumour, cannot be palpated, cannot be seen using imaging procedures
T1a	Tumour incidental histological finding in 5% or less of tissue resected
T1b	Tumour incidental histological finding in more than 5% of tissue resected
T1c	Tumour identified by needle biopsy (carried out as a result of raised PSA levels, for example)
T2	Tumour confined to the prostate gland
T2a	Tumour affects half of one lobe or less
T2b	Tumour affects more than half of one lobe
T2c	Tumour in both lobes of the prostate gland
T3	Tumour has broken through the prostate capsule (covering) Notes: invasion of the apex of the prostate or of the prostate capsule (but not beyond) is classed as T2 (not T3)
T3a	Extracapsular spread (one or both sides) with microscopic involvement of the neck of the bladder
T3b	Tumour infiltrates seminal vesicle(s)
T4	Tumour is fixed or invades neighbouring structures other than the seminal vesicles (neck of the bladder, external sphincter, rectum, levator muscles, pelvic wall)
N – Regional lymph nodes	
NX	Regional lymph nodes cannot be assessed
N0	No evidence of regional lymph node involvement
N1	Regional lymph nodes affected
M – Distant metastases	
M0	No distant metastases
M1	Distant metastases
M1a	Non-regional lymph nodes affected
M1b	Bone metastases
M1c	Other localisation(s)

(TNM 7th edition 2009 – German edition 2010)