



DIAGNOSTIC TOOLS FOR PROSTATE CANCER

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ABSTRACT

Cancer is a disease in which some of the body's cells grow uncontrollably and spread to other parts of the body. Cancer can start almost anywhere in the human body, which is made up of numerous cells. Generally, human cells grow and multiply (through a process called cell division) to form new cells as the body needs them. Any cell of the body that are up in years or got desecrate and replaced by new cells upon cell death.

At times this order of process is broken down and abnormal or damaged cells start growing. These cells form mass of tissues that forms tumours. Tumours are classified as cancerous and non-cancerous cells. Non -cancerous cells are called as benign tumours.

Tumours that turn cancerous outspread into tissues and can travel into different parts of the body and form newly affected tumours, and this process is called Metastasis. This cancer affected tumours is also called as Malignant tumours. Cancer forms solid tumours in general except for blood cancer types such as Leukaemia as they do not form solid tumours in the body.

The nearby tissues of the tumours are not affected benign tumours as they do not spread. Benign tumours do not grow back as they are less affecting to the body whereas cancerous tumours in rare cases do grow back. Benign tumours can be large quite sometimes and some of the benign tumours such as one that is formed in the brain can be a cause of life affecting situation.

KEYWORDS Prostate Cancer, Adenocarcinoma, Tumours, Malignant, Cell Growth, Sarcoma, Carcinoma, DNA Mutations.

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1. **INTRODUCTION:** Cancer is elucidated by unprincipled and extension of abnormal forms of the body's own cells. It is second to the CVS diseases as deadly disease in the developed and under-developing nations. One among every two people born after the year 1960 is diagnosed with some or the other form of cancer in their lifetime.

As per Cancer Research in the United Kingdoms (2016) more than 356,000 new cases were proclaimed in the UK in the year 2014, the lethality was over and above 163,000, (globally around 8 million).

According to the cancer research more than 30% deaths are caused by different classification of cancer in the United Kingdom.

Prostate gland is a male sex organ whose main objective is to secrete a fluid making up nearly most of the sperm. Nearly all the types of prostate cancer begin in the gland cells that make the prostate fluid. It is located behind the lower part of the pubic arch.

Prostate cancer develops when the cell of the prostate gland grows abnormally in an uncontrolled manner leading to form a malignant tumour.

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1.1 Dissimilarity Between Normal Cells and Cancer Cells⁽²⁾

The distinction between normal and cancerous cells are mentioned below:

- Grows in the unavailability of signals indicating the growth of normal cells from the brain.
- An action known as programmed death of cell or apoptosis is shun the signals that notify cells to terminate division.
- Intrude into nearer parts of the body and outspread the cancerous affect, non- cancerous cells inhibit division or growth when they run to other cells and most of the non-cancer cells are stationary, i.e., they do not travel across the body organs.
- Intimation to the blood vessels to grow in sync with the tumours. These blood vessels supply oxygenated and necessary nutrients to the tumours and the waste is being removed from the tumours.
- Does not come in contact with the immune system, as the immune system generally abolish the damaged or fatal cells.
- Few cancer cells misinterpret immune system in promoting the cancer cells to be alive and persuade the immune cells to shield the tumour cells in place of attacking them.
- Numerous changes in the chromosome number like deleting and duplication of chromosomes parts, cancer cells might multiply in the number of chromosomes.
- Cancer cells generate vitality from nutrients by the immune system different from that of a normal cell. This enhances the growth of the cancerous cells.

1.2 Spreading of cancer-⁽³⁾

The spread of cancerous cells from one place of the body to another place is called metastatic cancer, The process that outspread the cancer cells from one place to another in the body is called metastasis. Metastatic cancers have the same name and similar types of cancer cells as the parent or primary cells. For example, breast cancer that forms a metastatic tumour in the lung is metastatic, not lung cancer.

2. Types of Cancer

The cancer cells can be divided into more than 100 types based on the types of tissue cells that formed them and are named after the organ or tissue that is affected. For instance, lung cancer starts in the lung but does not affect the breast. ⁽⁴⁾

PROSTATE CANCER

3. INTRODUCTION- ⁽⁶⁾

According to the studies in the United States, prostate cancer has been said to be the leading cause of death among men in the country. Cancer develops very slow in the prostate, the diagnosis and treatment at an early stage can help in improvement of the health of male population.

In the year 1998, 39000 deaths were reported in the U.S, most men diagnosed with and dying of this disease are elderly.

As per the doctors it is found that almost all types of cancers occurring in the prostate region of male body starts from the gland tissues that make the prostate fluid and this kind of cancer cells are called as “adenocarcinomas.”

3.1 GROWTH AND SPREAD ⁽⁷⁾

Prostate cancer be in the habit to grow slowly, this means it is often found and is treated with it still in the prostate. Some cancer in the prostate cannot be treated right away, they can be diagnosed and treated if they start to grow.

The initial place where the cancer that grows in the body is called primary site or primary tumour. Alike any other type of cancer caused in the body, prostate cancer when not treated may outgrow in other parts of the male reproductive organs. Also, over a period it grows outside the region of prostate and affect tissues that are next to colon and bladder. The process where the cancer starts spreading to different parts of the body is called Metastasis. Once cancer has grown outside the prostate, it can spread to nearby lymph nodes, too. Lymph nodes are glands that are in size like a bean that are present all around the body and are part of the immune system. The prostate cancer if spreads to different parts of the body, it affects the bones prior than other body parts.it also spreads to body organs such as lungs, liver, and brain in severe cases.

Around 95% of prostate cancer are “adenocarcinomas”. Different types of prostate cancer start in different cells.

It is of two types in general, (a) Acinar adenocarcinomas; (b) Ductal adenocarcinomas.

Up to 5% of prostate cancer are not adenocarcinomas; they may be one among the following-

- Small-cell carcinoma
- Squamous-cell carcinoma
- Transitional cell (or Urothelial) cancer.
- Neuroendocrine tumours
- Soft tissues sarcoma

3.2 CAUSES OF PROSTATE CANCER⁽⁸⁾

It is not clear what causes prostate cancer, on a basic level, prostate cancer is caused by a change in the DNA of a normal prostate cell.

Some genes control when our cell grows, divides into new cells die; certain genes that help cells grow, divide, and stay alive are called oncogenes, genes that normally keep the growth of cell under control, repairs the mistakes in DNA, or causes cells to die at the right time are called Tumour Suppressor Genes.

Cancers can be caused by DNA mutations that keep oncogenes turned on or turn off tumour suppressor genes. These types of gene changes lead to uncontrolled growth of cells. Change in DNA is often inherited from the parent chromosomes or is acquired during a lifetime. Some mutations can be passed from generation after generation i.e., inherited and are basically found in all the cells of the body.

Most of the prostate cancer approximate statistics says around 10%, are caused by inherited gene changes. This type of cancers that are caused by inherited genes are called Hereditary cancer.

3.3 Risk factors⁽⁹⁾

Factors that increase your risk of prostate cancer include:

- a) Age: The risk of prostate cancer increases with age, it is most common after the age of 50.
- b) Race: for reasons not yet determined, black people have a greater risk of prostate cancer than do people of other races. Prostate cancer is also more likely to be aggressive or advanced in black people.
- c) Family history: if a blood relative, such as a parent, sibling, or child, has been diagnosed with prostate cancer, your risk may be increased.
- d) Obesity: people who are obese may have a higher risk of prostate cancer compared with people considered to have a healthy weight, though studies have had mixed results, people suffering from obesity the cancer is likely to be more aggressive and tend to return after the initial treatment.

3.4 PROSTATE CANCER- CLASSIFICATION

Other types of growth can form in the prostate. Some of them are not cancer, they are benign growths. Other kinds of growth in the prostate include:

TYPE	SITES AFFECTED	SYMPTOMS
Benign Prostatic Hyperplasia (BPH)	Prostate cells	Trouble in urinating
Prostatic Intraepithelial Neoplasia (PIN)	Prostate cells	Abnormal growth of prostate cells

4. SYMPTOMS⁽¹¹⁾

Early symptoms of Prostate Cancer:

- Frequent Urination
- Weak or interrupted urine flow or the need to strain to empty the bladder
- The urge to urinate frequently at night

- Blood in urine
- New onset of erectile dysfunction
- Pain or burning during urination

The signs and symptoms shown when cancer spreads exterior to the prostate gland:

- Discomfort in the back, hips and other bones.
- Bulge or fluid build-up in the legs.
- Inexplainable weight loss
- Drowsiness
- Discomfort or pain when sitting caused by an enlarged prostate.

5. **DIAGNOSTIC TOOLS FOR PROSTATE CANCER** ⁽¹²⁾ -

There are two types of diagnostic tools:

- (a) Pre-diagnostic tools
- (b) post-diagnostic tools.

Doctors have many test used for diagnosing prostate cancer, not all the test among these are used for every individual. Some of the below-listed factors are opting a diagnostic tool.

- Kind of cancer suspected
- Patient's symptoms
- Age of patients
- General health of the patient
- Medical History of the patient

5.1 **Pre- Diagnostic tools for prostate cancer** ⁽¹³⁾

When prostate cancer is suspected a physical examination is conducted along with the following test:

5.1.1 Prostate-specific antigen (PSA) Test- PSA is a protein released by prostate tissue that is found in higher levels in the blood, levels can be raised when there is an abnormal activity in the prostate, including prostate cancer, BPH, or inflammation of the prostate.

Physicians and Oncologists can observe the PSA value to make sure if a biopsy is required, example absolute level, change over time (also known as "PSA velocity") and level about prostate size.

Factors that might affect PSA levels:

- An enlarged prostate
- Older age
- Riding a bicycle
- Certain Urologic procedures
- Certain medications

5.1.2 Free PSA Test: This is a version of the PSA tests that allow measuring a particular component, called "free" PSA is known in the blood and is not bind to the proteins. A standard PSA test measures total PSA, which includes both PSA that is not bound to proteins. The free PSA test measures the ratio of free PSA to total PSA. Be acquainted with this ratio or per cent can sometimes

aid to find out if an increased PSA level is more likely to be associated with a malignant condition like prostate cancer.

5.1.3 Digital Rectal Test (DRE)- A DRE is used by the doctor to find abnormal parts of the prostate by feeling the area using a finger. It is not very precise and not all doctors are experts in the technique.

Therefore, DRE does not usually detect early prostate cancer.

Procedure of DRE:

- The doctor inserts a gloved, lubricated finger into the rectum to feel for any bumps or hard areas on the prostate that might be cancer.
- Prostate cancer often begins in the back of the gland, and can sometimes be felt during a rectal exam.
- This exam can be uncomfortable, especially for men who have haemorrhoids but it usually isn't painful and only takes a short time.

DRE is less effective than PSA blood test in finding prostate cancer, but it can sometimes find cancers in men with normal PSA levels. For this reason, it might be included as a part of prostate cancer screening.

5.1.4 Biomarker tests- a biomarker is a substance that is found in the blood, urine. or body tissue of a person with cancer. It is made by the tumour or by the body in response to cancer. Biomarker tests may also be called tumour makers.

It includes the 4kscore, which predicts the chances someone has prostate cancer.

5.1.5 Biopsy- a biopsy is the removal of a small amount of tissue for examination under a microscope. To get a tissue sample Transrectal Ultrasound or TRUS and a biopsy tool to take very small silvers of prostate tissue.

Procedure for collection of tissues:

- The procedure is usually done at a doctor's office or a hospital.
- Local anaesthesia is given to the patient beforehand to numb the area.
- Antibiotics are given to the patient to avoid infection.
- Ultrasound tools are passed into the rectum.
- The needle used in biopsy is passed through the rectum into the prostate gland for the collection of tissue sample

5.1.6 MRI Fusion Biopsy- An MRI fusion biopsy combines an MRI scan with TRUS. Evaluation with a prostate MRI scan has become a routine procedure in clinical practice.

Procedure for MRI fusion biopsy:

- Patient initially receives a MRI scan to find out the suspicious part of the prostate that needs more evaluation. Further ultrasound is done for the patient's prostate.
- Many computers software is used to produce a 3D image of the precise area of the prostate for biopsy.
- The need of repeated biopsy may not be avoided, MRI fusion biopsy can acknowledge better to find cancerous cells than other methods.

- An MRI fusion biopsy should only be performed by someone with expertise in the procedure.

5.1.7 Transrectal Ultrasound (TRUS)- The procedure is carried out by insertion of a probe into the rectum that takes picture of the prostate using sound waves that bounces off the prostate.

6. Post- Diagnostic Tools for Prostate Cancer-

To identify cancer that has spread outside the prostate, oncologists. A CT scan or bone scan may not be necessary for those with no symptoms and low-risk, early-stage prostate cancer, as determined with the information from the PSA test and biopsy.

Whole-body bone scan: a bone scan uses a radioactive tracer (Technetium-99) to look at the inside of the bones. The amount of radiation is too low to be harmful.

Procedure for whole-body bone scan-

- The tracer is injected into the patient's vein, it collects in areas of the bone where metabolic activity has occurred.
- Healthy bone appears lighter to the camera and areas of injury, such as those caused by cancer stand out on the image.

It is important to know that structural changes to the bone, such as arthritis or bone injuries like fractures can also be interpreted as abnormal and need to be evaluated by a doctor to make sure they are not cancer.

6.1 Computed Tomography (CT or CAT) scan-

A CT scan takes picture of internal body using x-rays taken from different angles. A computer combines these pictures into a detailed, 3- dimensional image that shows any abnormalities or tumours.

A CT scan can be used to measure the size of the tumours. A special dye called a 'contrast medium' is given before the scan to provide a better image. This dye can be injected into a patient's vein or given as a pill or liquid to swallow.

6.1.1 STAGING OF PROSTATE CANCER ⁽¹⁴⁾-

The TNM system is a method of staging prostate cancer. **TNM** is the acronym for **T**umour, **N**ode, **M**etastasis.

T₁ T₁ explains whether the cancer is too small to be identified on a scan, or felt during the examination of the prostate.

	Cancer is less than 5% of removed tissue.
	Cancer is 5% or more of the removed tissue.
	Cancers are found by biopsy, T _{1c} cancer is observed after raised PSA test.
T₂	Cancer cells are completely inside the prostate gland.
T_{2a}	Cancer is only present in one half in the prostate.
T_{2b}	Cancer is present in more than half of one side of the prostate.
	Cancer is on both sides but is present internally in prostate gland.
T_{2c}	
T₃	Cancer has broken through the capsule (covering) of prostate gland.
T_{3a}	The capsule or covering can be broken of the prostate gland.
T_{3b}	Cancer spreads into the tubes that carry semen (seminal vesicle).
T₄	Cancer has spread into the other body parts or organs nearby such as back passage, bladder or pelvic wall.

Tumour- tumour describes the size of the tumour (area of cancer). This is a simplified description of the T stage. There are 4 main stages of cancer size in prostate cancer- **T₁** to **T₄**.

6.1.2 Node (N)-

Node (N) explains whether cancer has spread to the lymph node, Node (N) is divided into two types- **N₀** and **N₁**.

N₀	Represents nearby lymph nodes do not possess any cancer cells
N₁	Presence of cancer cells in lymph nodes near prostate gland.

6.1.3 Metastasis (M)-

Metastasis (M) is a stage of cancer that explains whether cancer has spread to other parts of the body.

There are 2 stages of metastasis- **M₀** and **M₁**

M₀	Cancer hasn't spread through the body.
M₁	Cancer has spread to other body parts outside the pelvis.

M₁ is subdivide into 3 types- M_{1a}, M_{1b}, M_{1c}.

M_{1a}	Cancer cells are present in lymph nodes.
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<i>M_{1b}</i>	Cancer cells are present in bones.
<i>M_{1c}</i>	Cancer cells are present in other body parts.

7. TREATMENTS ⁽¹⁵⁾.

Newer treatments are being developed and improvements are being made among many standard prostate cancer treatment methods.

Table no. 3: Drugs that are used in cancer treatment are classified based on the nature of drug, they are as follows:

SR.NO.	DRUG CLASSIFICATION	DRUG	BRAND
1.	ANTIMETABOLITES	Cladribine	Generic Only
		Cytarabine	Depocyt
		Fludarabine	Generic Only
		5- Fluorocil	Adrucil
		Gemcitabine	Gemzar
		6-Mercaptopurine	Purinethol
		Methotrexate	Trexall
		Pemetrexed	Almita
		Pralatrexade	Folotyn
2	ANTIBIOTICS	Bleomycin	generic only
		Daunorubicin	cerubidine
		Daxorubicin	Adriamycin, doxil
		Idarubicin	Idamycin
		Mitoxantrone	generic only
3	ALKYLATING AGENTS	Busulfan	Myleran
		Carmustine	Bicnu
		Chlorambucil	leukeran
		Cyclophosphamide	Cytoxan
		Dacarbazine	generic only
		Ifosfamide	ifex
		Lomustine	gleostine
		Melphalan	alkeran

		Temozolomide	temodar
4	MICROTUBULE INHIBITORS	Docetaxel	Taxotere
		Paclitaxel	taxol
		Vinblastine	generic only
		Vincristine	vincasar PFS
		Vinorelbine	navelbine
5	STEROID HORMONES AND THEIR ANTAGONISTS	Anastrozole-	Arimidex
		Bicalutamide	casodex
		Enzalutamide	xtandi
		Flutamide	generic only
		Goserelin	zoladex
		Letrozole	femara
		Leuprolide	Lupron
		Nilutamide	nilandrin
		Raloxifene	evista
6	MONOCLONAL ANTIBODIES	Bevacizuma	Avastin
		Cetuximab	Erbix
		Daratumumab	Darzalex
		Panitumumab	Vectibix
		Ramucirumab	Rituxan
		Trastuzumab	Herceptin
7	TYROSINE KINASE INHIBITORS	Afatani	Gilotrif
		Dabrafenib	Tafinlar
		Dasatini	Sprycel
		Erlotiniba	Tarceva
		Ibrutinib	Imbruvica
		Idelslisib	Zydelic
		Imantinib	Gleevec
		Nilotinib	Tasigna
		Osimeritnib	Tagrisso
		Pazopanib	Votrient
		Sorafenib	Nexavar
		Sunitib	Sutent
Trametini	Mekinist		
		Vemurafenib	zelboraf

7.1 Surgery- Doctors constantly improve the surgical techniques used to treat prostate cancer, the aim is to exclude all the cancer while lowering the risk of complications and side effects from the surgery.

7.1.1 TYPES OF SURGERY FOR PROSTATE CANCER:

Open/laparoscopic radical prostatectomy
Laparoscopic prostatectomy
Transurethral resection of the prostate (TURP)

7.1.2 RISK OF PROSTATE SURGERY:

Reaction to anaesthesia
Bleeding from the surgery
Blood clots in the legs and lungs
Damage to the nearby organs
Infection at the surgery site

7.1.3 Side effects of prostate surgery:

The major possible side effects of radical prostatectomy are urinary incontinence (being unable to control urine) and erectile dysfunction (impotence; problems getting or keeping erections)

7.1.4 Radiation therapy-

Advances in technology are making it possible to aim radiation more precisely than in the past. Current methods such as conformal radiation therapy (CRT), intensity-modulated radiation therapy (MRT), and proton beam radiation helps to avoid giving radiation to normal tissues as much as possible. These methods are expected to increase the effectiveness of radiation therapy while reducing the side effects.

7.1.5 High- Intensity Focused Ultrasound- HIFU destroys cancer cells by heating them with highly focused ultrasonic beams. This treatment is in application in few countries for a while.

Its safety and effectiveness are now being studied.

7.1.6 Hormone therapy- Several newer forms of hormone therapy have been developed in recent years, some examples include abiraterone, enzalutamide, and apalutamide.

Hormone therapy may be used:

- a) If cancer has spread too far to be cured by surgery or radiation, or if you cannot have this treatment for some other reason.

- b) If cancer is not treated or is diagnosed again post-treatment with surgery or radiation.
- c) Along with radiation therapy as the initial treatment, if you are at a higher risk of cancer coming back after treatment.
- d) Before radiation tries to shrink cancer to make treatment more effective

7.1.7 Types of hormone therapy used to treat prostate cancer⁽¹⁵⁾-

1. Bilateral orchiectomy- surgical removal of both testicals.
2. LHRH agonists- reduces the testosterone levels by blocking the signals received by the body.
3. GnRH antagonists- inhibits the production of testosterone by the testicals.
4. Androgen receptor (AR)inhibitors- inhibits the binding of testosterone to the androgen receptor.
5. Combined androgen blockade- Androgen receptor combined with orchiectomy or LHRH agonist 0maximizes the blocking of male hormones to prevent the flare associated with treatment with LHRH agonists.

7.2 Chemotherapy- in recent years studies have shown, chemotherapy drugs affect prostate cancer, some drugs like docetaxel (Taxotere) and Carbazitaxel increases the probability or men living a longer life.

Immunotherapy- the goal of immunotherapy is to boost the body's immune system to help fight off or destroy cancer cells.

7.2.1 Chimeric antigen receptor (CAR) T-cell therapy:

In this treatment, immune cells called T cells are removed from the patient's blood and altered in the lab so they have receptors called Chimeric antigen receptors (CAR) on their surface. The receptors are made to attach to the proteins on the surface of prostate cancer. The hope is that they find the prostate cancer cells in the body and launch a precise immune attack against them. CAR T- cell therapy for prostate cancer is a complex treatment with potentially serious side effects, and it is only available in clinical trials currently.

7.2.2 Targeted therapy for prostate cancer:

This type of cancer treatment uses drugs to identify and attack the cancerous cells while the normal cells are collateral damage to the body. These targeted therapy attacks the inner working of the cancer cells which make them distinctive from normal cell. Every type of targeted therapy is different in the way of working, they change the way of growing of cancer cells. Drugs that are taken twice a day by mouth as pills are Rucaparib (Rubraca) and Olaparib (Lynparza), these drugs are PARP inhibitors (*Poly (ADP)-ribose polymerase*), these PARP enzymes are normally involved in one pathway to help repair damaged DNA inside the cells.

Treatment of prostate cancer that has spread to the bones- radiofrequency ablation (RFA) is studied to help control the pain in the men whose prostate cancer has spread to one or more areas in the bones. During RFA, the doctor uses a CT scan or ultrasound to guide a small metal probe into the area of the tumour. A high-frequency current is passed through the probe to heat and destroy the tumour. RFA has been used for many years to treat tumours in other organs such as the liver, but its use in treating bone pain is still fairly.

8. LIFESTYLE HABITS THAT CAN BE PRACTICED TO AVOID PROSTATE CANCER:

- ✓ Eating a healthy plant-based diet and avoiding animal products.
- ✓ Be physically active
- ✓ Seek to maintain a healthy weight
- ✓ Limit the amount of alcohol consumption
- ✓ Avoid tobacco or tobacco-based products like cigarettes
- ✓ Skin protection against UV- radiation
- ✓ Proper sleep cycle
- ✓ Regular physical exams to avoid risk of prostate or any other cancer.

9. CONCLUSION:

Prostate cancer is among the leading causes of death among men globally after lung diseases. The development of prostate cancer can be used as a biomarker for the disease which provides information on stages and cause of cancer (Commonly mutated genes, proteins, and pathways associated with an increased risk of prostate cancer development). Biomarkers give ordain on the type of treatment that is required for cancer. There is an urgent need for effective and targeted specific treatment for prostate cancer.

The treatments that are currently available for prostate cancer are benefited to only few of the patients as the number of side effects that affect the quality of life of the patients are compromised eventually. The diagnostic protocols that are been used such as chemotherapy, radiotherapy and hormonal treatment have many adverse effects which include drug resistance which eventually applies as a setback for cancer treatment. Medicinal plants and gene therapy and the application of nanotechnology in research have currently proven to decrease the side effects to restore the chemosensitivity in resistant tumour cells. Some promising alternatives for prostate cancer treatment are the fraction of medicinal plant and targeted therapies based on the cellular pathways with genetic material encapsulated in target specific nanocarriers with controlled release.

Table no.1: classification of cancer

<i>CLASSIFICATION OF CANCER</i>	<i>SITES AFFECTED</i>
Brain & Spinal Cord Tumours	The base of the skull and the lower portion of the spine.
Prostate Cancer	Prostate Gland.
Cervical Cancer	Cells of Cervix.
Oral Cancer	Lips, first parts of Tongue, mouth roof and floor, oropharynx.
Breast Cancer	Glandular tissue called lobules and milk-producing ducts.
Lung Cancer	Cells of the lungs.
Colon and Rectal Cancer	Large intestine (colon).
Stomach Cancer	Any part of the stomach.
Skin Cancer	Primarily in sun-exposed areas.
Thyroid Cancer	Thyroid gland.
Testicular Cancer	Testicles, or at the back of the abdomen (retroperitoneal).
Fallopian Tube Cancer	Either one fallopian tube or both tubes.
Ovarian Germ Cell Cancer	Originates in the ovaries or related areas of the fallopian tube.
Hepatocellular (liver) Cancer	Liver.

Table no.: 2 a list or rare types of cancers ⁽⁶⁾

TYPES OF CANCER**SITES AFFECTED**

Oesophageal Cancer	Oesophageal tube.
Chronic Myeloid Leukaemia (CML)	Bone marrow makes abnormally high numbers of blood cells.
Childhood acute lymphoblastic leukaemia	Bone marrow and blood.
Anal cancer	Anus.
Merkel cell carcinoma	Lump on the skin.
Thymic carcinoma	Outer cells of the thymus.
Hepatoblastoma	Liver (children of age 1-3).
Glioblastoma	Brain tumour.
Ewing sarcoma	Bone tissue.
Kaposi sarcoma	Cell lining lymph or blood vessels.

Figure:1 the figure shows the cancerous cells in the prostate gland

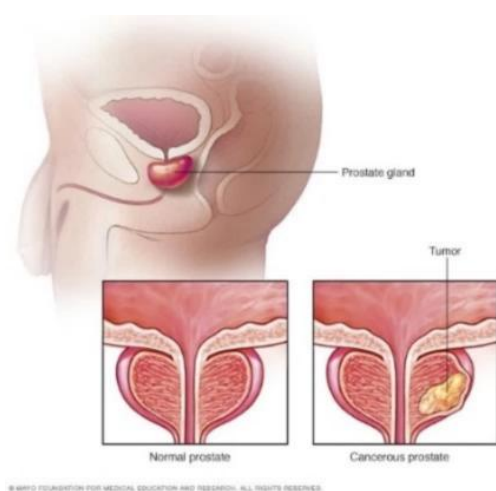
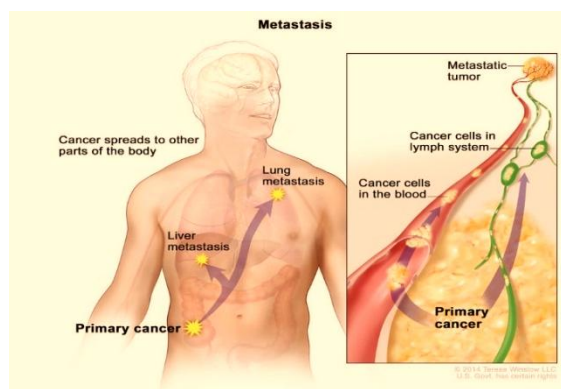


Figure 2: the figure shows the metastasis of cancerous cells, the primary site through which the cancer spreads from one place to



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- 14) Treatment of prostate cancer- <https://www.mayoclinic.org/diseases-conditions/prostate-cancer/diagnosis-treatment/drc-20353093>, <https://www.cancer.org/cancer/prostate-cancer/treating.html>, <https://my.clevelandclinic.org/health/diseases/8634-prostate-cancer>
- 15) Types of hormone therapy- <https://www.cancer.net/cancer-types/prostate-cancer/types-treatment>