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Epidemiology of Prostate Cancer In North-West – Bank, Palestine 1998-2006

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Epidemiology of prostate cancer in north west bankPalestine 2006 -1998

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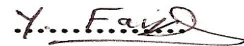

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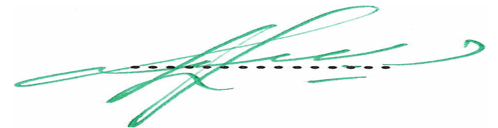

Dedication

To

******

My Wife Huda

My sons

Mahdi

Ahamd

Hashem

ACKNOWLEDGMENTS

I would like to express my Sincere Special Thanks and Gratitude to my Supervisor:

Dr. Bowirrat Abdalla M.D., Ph.D.
Assoc. Professor of Medicine - An-Najah University, Nablus (PA).

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Abbreviation:

(BPH)	Benign Prostatic Hyperplasia
(PSA)	Prostate Specific Antigen
(DRE)	Digital Rectal Examination
(CDC)	Disease Control and Prevention
(RP)	Radical Prostatectomy
(PAP)	Prostatic Acid Phosphatase
(FDA)	Food and Drug Administration
(FPSA)	Free Prostate Specific Antigen
(CPSA)	Complexes Prostate Specific Antigen
(RR)	Radiation Therapy
(TPA)	Tissue Polypeptide Antigen
(IGF)	like growth factor
(ACS)	American Cancer Society
(CT)	Chemotherapy
QALYs	Quality-adjusted life years

Epidemiology of Prostate Cancer
In North-West – Bank, Palestine
1998-2006

Presented BY
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Abstract

OBJECTIVE: To evaluate the magnitude of prostate cancer in the North West-Bank, and to shade light on risk factors affecting its distribution.

DESIGN /METHODS: In a descriptive and retrospective study, we conducted a large study among hospitalized patients. Data were collected from Teaching Hospitals (Al Watani, Beit Jala and Jinnen hospitals), during the period (1998-2006). The total population number were 750.000, of whom 70.000 men, 40 years or older were our target. Analysis based on patient admissions, and statistical methods were (ANOVA Test, T-test, Correlation, Chi squire test, Descriptive statistics and frequencies and percentile methods).

RESULTS: 78 prostate cancers were reported with incidence rate of 10.4 per 100.000 populations. We revealed that the majority of patients (64.1%) were diagnosed in Nablus and the lowest (6.4%) in tulkarem city The highest percentage was among: [Non-smokers vs. smokers (61.5% vs 37.2% respectively), industrial workers vs. Doctors (42.3% vs 5.1%), families of seven children or over vs. less than three (56.4% vs. 5.1%), patients over 65 years, with high PSA serum levels (20ng/ml or over), (64.1%)]. Person Chi Square df, significant values of PSA categorized and

dependent variables (Occupation, no. of children and Age), showed a Pearson correlation and statistical significance at P-Value = 0.05 which was respectively (0.016, 0.018, 0.003). Significant relationship was found between age and infection (P-value = 0.032) and between cancer stage and age (0.021).

CONCLUSION: Prostatic carcinoma in the West-Bank, disproportionately strikes in different towns in West-Bank, with high prevalence in Nablus and low prevalence in tulkarem. This prevalence is low compared to Western Countries despite the high intake of calories.

Introduction:

Prostate cancer is a group of cancerous cells (a malignant tumor) that begins most often in the outer part of the prostate. It is the most common type of cancer (excluding skin cancer) diagnosed in American men. In 1998-2006, an estimated 295,900 new cases of prostate cancer will be diagnosed in the U.S. Early prostate cancer usually does not cause any symptoms. However, as the tumor grows, it may spread from the prostate to surrounding areas. Change in urination, including increased frequency, hesitancy or dribbling of urine may be experienced. Prostate cancer can spread from the prostate to nearby lymph nodes, bones or other organs. This spread is called metastasis. For example, as a result of metastasis to the spine, some men experience back pain. The prostate is a gland of the male reproductive system. The prostate produces some of the fluid for semen, which transports sperm during the male orgasm. Normally, the prostate is quite small it is nearly the same size and shape as a chestnut. It is located in front of the rectum, just below the bladder, and wraps around the urethra, the tube that carries urine from the bladder out through the tip of the penis. The prostate is made up of approximately 30% muscular tissue, and the rest is glandular tissue.

Prevalence Prostrate Cancer Worldwide:

Prostate cancer is considered to be the second leading cause of cancer death in men worldwide, exceeded only by lung cancer. In USA prostate cancer is the most common type of cancer found in American men, followed by lung and skin cancer. We know that the estimate incidence will be about 295,900 new cases of prostate cancer in the United States in the year 1998-2006. About 33,900 men will die annually of this

disease, roughly one death every twenty minutes, in the next 24 hours, prostate cancer will claim the lives of over 80 American men. The frequency of the disease is different even in the same country, or worldwide, for example, prostate cancer is about twice as common among African-American men as it is among white American men. It is also most common in North America and northwestern Europe. But, it is less common in Asia, Africa, and South America.

The National Prostate Cancer Coalition in USA provides recently a statistical data describing the distribution of the disease and its frequency, showing that one new case of prostate cancer is diagnosed every three to four minutes, approximately 190,000 new cases each year. This data represents 30% of all new cancer cases in American men.

The incidence rates of Prostate cancer increased 192% between 1973 and 1992. One in six American men is at lifetime risk of prostate cancer. If a close relative has prostate cancer, a man's risk of the disease more than doubles. With two relatives, his risk increases fivefold. With three close relatives, his risk is about 97%. African American men have the highest prostate cancer incidence and mortality rates in the world. The incidence rate is about 35% - 50% higher than - and mortality rate double - that of Caucasian males, who have the second highest rate. This high frequency demonstrates the remarkable and tremendous spread of the disease and opens the alarm for immediate and urgent prevention and treatment.

In 2002, over 189,000 new cases of prostate cancer were diagnosed in the United States, making it the leading form of cancer in men.[1] This represents 30% of all new cancer diagnoses in men and is comparable to the incidence of breast cancer in women. One in six men will develop

prostate cancer at some point in his life, based on data collected from 1993 to 1995 by the Surveillance, Epidemiology, and End Results (SEER) Program of the National Cancer Institute (NCI). Incidence trends for prostate cancer have reflected an increased detection rate of prevalent cancers with the advent of prostate-specific antigen (PSA) testing.[2, 3] In addition; mortality from prostate cancer remains a significant problem. An estimated 30,200 deaths from prostate cancer in 2002 make it the second leading cause of cancer death in men after lung cancer).[1] There was a slow rise in age-adjusted death rates from the 1930s until the 1980s; however, a recent downturn during the past decade suggests some promise that earlier detection and better therapy may be decreasing mortality.[1, 4-6]

Prevalence of Prostate Cancer in Palestine 1992 – 2002:

In our study we conducted a large prospective and retrospective screening and survey study among hospitalized, confirmed cases located under medication and follow up in different hospitals in North West-Bank, Palestinian Authority. We used every data available from hospitals and listed patient's records after obtaining consent forms and permission. We looked for the prevalence of confirmed, hospitalized and under treatment patients in different geographical location in North West-Bank Teaching hospitals (Al Watani, Beit Jala and jenin hospitals), located in different towns in North West-Bank (Nablus, Jeneen, Tulkarem, Qalqelya), and the rural areas surrounding these town that take medical treatments and attention in these towns). The total number of inhabitants living in this geographical area under study is about 750.000 residence, the total number of target people included in our survey is 70.000 men 40 years or older.252

The prevalence of prostate cancer in West-Bank (Palestine), was calculated, for all the period between (1992 – 2002). 271 cases of prostate cancer were reported. The estimate prevalence was 28.9 per 100.000 populations. This low rate frequency of the disease was compared with other populations living in the same geographical area and almost has the same environmental risk factors. In Jordan for example; the rate frequency was outstandingly high and was calculated to be 72.9 per 100.000[7], in contrary, in Israel the rate frequency was extremely low (15.5 per 100.000),[8] in comparison with Jordan and with the Palestinian. This low frequency among Israeli populations may relate to the early PSA detection, diagnosis and to the improved medical center, which has a big role in, early recognition of the disease. Medical information and health education among the population can help early intervention and treatment.

Distribution of prostate Cancer In different towns in Palestine was calculated.

The highest prevalence rate of the prostate cancer was found in Bethlehem and Nablus (46.2 and 46.1) per 100.000, respectively, where in Jerusalem was the lowest (3.5 per 100.000).253

The lowest prevalence in Jerusalem was explained, by the medical benefit given for the Palestinian population living in Jerusalem. Because, East Jerusalem is still under the medical basket of Israel and it is still lay under the responsibility of the Israeli health system, where sophisticated equipments, developed hospitals, early detection and medical treatment are easily achievable and free. The high prevalence, observed in Nablus and Bethlehem (out of Israeli medical system), may related to the poor health

system, low socioeconomic situations and low medical care and attention under occupation.

The reasons of high frequency observed during theses years among Palestinians seems to be related also to different points –

Firstly: The difficulty to diagnosis the disease in the local clinics in rural areas surrounding the big towns because of the difficulty in transportation and free movement of the population as result of the military siege and the occupation.

Secondly; the low socioeconomic situation in the Palestinian authority, the underprivileged medical attention, lack of the infrastructures and specialized medical teams at the Palestinian hospitals.

Thirdly, it is will known that the Palestinian health system was under the Israeli occupation's responsibility and after the Intifada, this system was moved to the Palestinian authority control, without any resources or help.

Fourthly; the illiteracy and low awareness among the population increase not only the risk but also the manifestation of the different diseases and especially the prostate cancer.

Aims of our study among Palestinian:

1. General Aims:

We are looking to conduct a large study among the Palestinian population looking forward to increase the awareness and the early diagnosis and detection of the disease, thus, by encouraging population at

risk who had a relative or family member suffered or still suffering from urinary disturbances and especially prostate diseases to examine himself early and immediately. Prevention is the cornerstone to fight any disease. When early the diagnosis is better the prognosis and the chance of survival. Giving medical consciousness and information to the community may reduce the number of patients with prostrate cancer.

2. Specific Aims:

1. To estimate the prevalence of prostate cancer in the north west bank, and shade light to the different risk factors affecting it distribution, taking in consideration; occupation, residence and location, diet and habits.

2. To highlight and increase the medical information and awareness to the general population and encourage them to examine themselves early and quickly, if they have any symptoms or inconvenient related to prostate pathology, this may reduce any complication in future and will facilitate the medical intervention.

3. To encourage our doctors to use and consider more sophisticated medical exams and high technology machines to help us in diagnosis.

4. To encourage our Doctors to investigate the disease using international medical experiments and protocols, looking for the new treatment procedures, and any innovations used abroad.

5. To encourage collaborations and exchange of information with other centers in and abroad; by asking support, medical help and new treatment available.

6. To share our study results with our health system and to look together to found the ways that may reduce the distribution of the disease – by increasing health awareness, and provide health counseling and information to the community that may prevent and decrease the disease. We shall recommend our Doctors to take seriously any complains from the population at risk.

Design and Methods:

In this study we conducted a large screening and survey study using hospitalized, confirmed cases located under medication and follow up in different hospitals in North West bank during the period 1998-2006. Screening tests were used including:

(Questionnaires, Interviews and Patient's Clinical Diagnosis and Hospitals records). Consent forms and official permissions were obtained from the official authorities to conduct this study. We looked for the prevalence of confirmed, hospitalized and under treatment patients in different geographical location in north west-bank (Nablus, Jeneen, Tulkarem, Qalqelya, and the rural areas surround these town that take medical attention in these towns). The total number of inhabitants living in our geographical area under study is about 750.000 residence, the total number of target people included in our survey is 70.000 men 40 years or older.

In our study we collected all the information available and every diagnosis of every male up to 40 year old, who frequent the different hospitals located in the towns mentioned up. We will ask about information like: (Occupation; Habits; Past medical history; Family medical history and especially Urogenital diseases, Inflammations and Six diseases).

We asked for further investigations for every subject at risk for prostate disease: like PSA- blood test followed by Imaging. Any case diagnosed early is a gain for our healthy system and for the patient himself: for low cost treatment and immediate intervention and high chance of survival. Early diagnosis will help us detect and surround tumors in its first stage, and early surgery and removable of the prostate cancer will increase the survival and ameliorate the prognosis and the quality of life and will decrease the period of hospitalization and the economic costs.

After screening test it's perhaps useful to classify the patients according to the PSA outcomes; PSA screening can be divided into several groups affecting a cure approach. Clearly, current, modes of screening are able to detect some such tumors, but they also detect both untreatable and non-fatal tumors, as well as leaving an unknown number undetected.

One group comprises patients whose cancer would have been cured by treatment even if had not been detected by screening. Their lives will not be improved by an earlier diagnosis.

A second group is those patients with incurable cancer at the time of screening. These patients will die, and screening does not help them.

A third group comprises patients whose cancer would not have been found without screening, but who die of causes other than prostate cancer. The quality of life (QOL) could be reduced by treatment. The main beneficiaries of screening program are those patients whose cancer would have been incurable if it had been diagnosed clinically, but is curable if found early through screening.

A fourth group (the largest) is men tested who do not have malignancy. The net harm done to this group is relatively small unless they go to biopsy when morbidity and anxiety can be significant.

Statistical Methods:

The purpose of our statistical analysis is to examine the difference between the groups of every independent variable relative to carcinoma of the prostate, and to examine the relation and the correlation between the independent variables and prostrate carcinoma. Also, we are going to describe the independent variables.

We are going to use different statistical methods in our study:

1. ANOVA Test.
2. T-test (independent sample t-test)
3. Correlation
4. Chi squire test.
5. Chronpach alyha - reliability.
6. Descriptive statistics.
7. Frequencies and percentile methods.

Diagnosis of Prostate Cancer:

Regarding the diagnoses of prostate cancer and determining whether you have prostate cancer it is generally involves a series of tests and exams. Before starting the testing process, your physician may ask you questions about your medical history, your family history of cancer and

any symptoms you may be having, particularly problems with urination. Then, your doctor will most likely proceed to one or more of the tests described below:

1. Digital Rectal Exam (DRE):

Because the prostate lies in front of the rectum, your physician can feel the prostate by inserting a gloved, lubricated finger into the rectum. This simple procedure is called a digital rectal examination (DRE). It allows your physician to determine whether the prostate is enlarged or has lumps or other types of abnormal texture.

2. Prostate-Specific Antigen (PSA) test:

Used in addition to the DRE, a PSA test increases the likelihood of prostate cancer detection. PSA is the abbreviation for prostate-specific antigen, a substance produced by the prostate cells. A PSA test measures the level of PSA in the bloodstream and is reported as nanograms *per* milliliter, or ng/ mL. Very little PSA escapes from a healthy prostate into the bloodstream, but certain prostate conditions can cause larger amounts of PSA to leak into the blood. They are two possible causes of a high PSA level are:

1. A benign non-cancerous enlargement of the prostate called benign prostatic hyperplasia (BPH).
2. Prostate cancer.

A high level of PSA in the bloodstream is a warning sign that prostate cancer may be present. But since other kinds of prostate disease can also cause high PSA levels, PSA testing by itself cannot confirm the

presence of prostate cancer. A high PSA level only indicates the possibility of prostate cancer and the need for additional evaluation by your physician. Conversely, a low PSA level does not always mean that prostate cancer is not present. According to the American Cancer Society, men aged 50 and older, and those over the age of 45 who are in high-risk groups, such as African-American men and men with a family history of prostate cancer, should have a prostate-specific antigen (PSA) blood test and digital rectal exam (DRE) once every year. Any man who develops persistent urinary symptoms should contact his physician.

3. Transrectal Ultrasound (TRUS):

Trans-rectal Ultrasound (TRUS) is the use of sound-waves to create an image of the prostate. As the waves bounce off the prostate, they create a pattern that is converted into a picture by a computer. TRUS is used to detect abnormal prostate growth and to guide a biopsy of the abnormal prostate area.

4. Biopsy:

Biopsy is the removal of a sample of tissue, which is then examined under a microscope to check for cancerous changes. Only a biopsy can definitely confirm prostate cancer. Typically, the physician takes multiple tissue samples for biopsy. Keep in mind that it is still possible to have cancer, even if the biopsy is negative. This is because, even though multiple samples are taken during a biopsy, it can still miss some cancers. If the biopsy is taken and prostate cancer is found, the tumor is graded in the medical lab. The grade estimates how aggressive a prostate cancer is; how fast it is growing and the likelihood of its spreading. Sometimes you will hear the grade referred to as the *Gleason grade*. Once diagnosis is

made, prostate cancer is categorized into stages based on the size and spread of the disease. Learn more about grading and staging of prostate cancer.

Major treatment options:

The major treatment options for prostate cancer include:

1. Watchful waiting (Observation).
2. Hormonal therapy.
3. Radiation.
4. Chemotherapy.
5. Immunotherapy.
6. Radical prostatectomy.

Limitation of our study and Bias:

We observed several inconvenient and difficulties in our study that we can summaries down:

1. Checkpoints of Israeli soldiers, between cities and their villages inhibit sometimes people to arrive to cancer center for further investigations.
2. Some people prefer to go abroad for treatments and our contact with them was difficult sometimes (withdrawals from our study fellowship).
3. Collaborations between hospitals and Aged patients were difficult. Some diagnosed people with old ages not cooperative.

4. Transport and communication between the patient and cancer center, was also difficult that obligate us to use phones calls instead to see the patient.

5. Ritual limitation, or habits, some people refused to conduct rectal examination!

In our study we do not found any systemic error or bias in the design or conduct of a study. Our design and procedures were extremely adequate, also because almost all our participants were hospitalized and already diagnosed with prostate cancer. Other important issue we do not encountered an Information Bias which result from a systematic tendency for individuals selected for inclusion in the study to be erroneously placed in different exposure/outcome categories, thus leading to misclassification, this come because our patients were hospitalized. In conclusion; out of some inconvenient problems our study demonstrates validity and faithfulness beside accuracy.

CHAPTER ONE

1. 1 Prostate Anatomy & Function:

The prostate is a small gland, about the size and shape of a quail's egg. Nestled in the man's pubic bone and surrounded by the pelvic muscles, the prostate gland will respond to pressure applied through the rectum. The main function of the prostate is reproduction. The testicles produce sperm, the "little guys" that fertilize eggs. The vas deferens carries this sperm to the prostate, where it mixes with fluid from the prostate and seminal vesicles. When you have an orgasm, you ejaculate this fluid, which is comprised of 5% sperm and 95% seminal/prostate fluid.

1. 2. Epidemiology & Incidence studies worldwide:

1. Prostate cancer is the second leading cause of death in American men (exceeded only by lung cancer). An estimated of 295.900 new cases of prostate cancer will be diagnosed in the United States during 1998-2006.

2. Between 1973 and 1993, the rate of new cases of prostate cancer rose by 173 percent, due in part to more widespread prostate-specific antigen (PSA) screening and in part to the aging of the U.S. population.

3. One out of 10 American men will develop the disease at some point in his life, most after age 65.

4. Eighty-nine percent of men diagnosed with prostate cancer survive at least five years; 63 percent survive at least 10 years.

5. African-American men have the highest prostate cancer incidence and mortality rates in the world (a 9.8 percent lifetime risk of

developing the cancer compared to 8 percent risk for United States white men), and are twice as likely to die from it as other men with prostate cancer. Asian men have the lowest incidence of prostate cancer. Researchers do not have a complete explanation for the ethnic variance, although diet may play a role.

6. The risk of developing prostate cancer begins to increase at age 50 in white men who have no family history of the disease and at age 40 in African-American men and men who have a first-degree relative (father, brother) with prostate cancer. Risk increases with age, however unlike other cancers; prostate cancer has no “peak” age.

7. True hereditary prostate cancer occurs in a very small number of men and tends to develop at a very young age (younger than 55 years old).

8. The American Cancer Society and the American Urological Association recommend annual prostate specific antigen tests, along with a digital rectal exam for all men over 50 and beginning at age 40 for high-risk men. If prostate cancer is detected early, treatment can be effective and have minimal morbidity.

Prostate cancer is a significant health problem in most industrialized Western countries, where it is the most commonly diagnosed cancer affecting men after middle age. The worldwide 5-year prevalence of prostate cancer has been estimated at 1,554,700 cases.

Western countries: In Western countries the percentage incidence of cancer in males is estimated to be about 30% of all men will develop microscopic prostate cancer during their lifetime. However, as most

prostate cancers tend to grow slowly, the risk of developing overt clinical disease is 8% (lifetime risk), and the risk of actually dying from prostate cancer is only 3%, whereas the autopsy based prevalence is 80% by the age of 80 years. Therefore, most men die with prostate cancer, rather than from it.

Based on US data, for a 50 year-old man with a life expectancy of 25 years, there is a 42% lifetime risk of having microscopic cancer, a 9.5% risk of having clinically evident cancer and a 2.9% risk of dying from prostate cancer.

In recent years, the veritable epidemic of prostate cancer has probably resulted from the widespread use of PSA testing which allows the earlier diagnosis in men who have not yet developed symptoms. As an example, it is estimated that in 1998-2006 in the USA there will be approximately 295,000 new diagnoses of prostate cancer and 29,000 deaths (approx 1 every 15 minutes). Prostate cancer is primarily a disease of men over the age of 50 years, and the trend towards an ageing worldwide population is likely to lead to an increased incidence of cases of prostate cancer. It is estimated that the incidence of prostate cancer is increasing at an average rate of 3% a year.

As an example, data from the United-Kingdom for the year 2000 identified the following:

1. The overall incidence of prostate cancer was 98 per 100,000, ranging from 5.8 per 100,000 in men aged 45- 49 years to 945.8 per 100,000 in men aged >85 years.

2. The overall mortality rate was 35 per 100,000, ranging from 2 per 100,000 in men aged 45 – 54 years to 846 per 100,000 in men aged >85 years
3. Most deaths (93%) occur in men aged >64 years.

Similar data is available for the European Union, where it has been reported in 2003 that the age-standardized incidence is 65/100,000 and mortality is 26/100, 00 per year. Prevalence is however, increasing in younger men, a study spanning 20 years has found an increase of approximately 50% in the number of cases in men less than 60 years of age:

The incidence of prostate cancer varies from country to country, with the highest incidences being found in the Western world and the lowest being found in Asia. Data for the year 2000 identify that whereas the incidence in the USA was 140 per 100,000, for Japan it was 22 per 100,000 and for China it was 1.54 per 100,000. Prostate cancer has become one of the leading male cancers in some Asian countries with the incidence having risen rapidly in the last 20 years.

The reasons for this high degree of variability between ethnic groups are probably multi-factorial and include the availability of improved detection methods, increasing westernization of lifestyle and in particular genetic risk factors.

The stage distribution at the time of diagnosis also varies around the world. In the USA in 2001 only 13% of tumors were diagnosed as Stage 3 or 4, whereas the corresponding figures in 2000 for South Korea were 72% and for Taiwan in 1998 they were 58%. However, in most Asian countries

there is evidence that there is a trend towards diagnosing cancer with more favorable prognosis. Again this is probably a reflection of improved diagnostic and screening procedures

After lung cancer, prostate cancer is the second most common cause of cancer death in men being responsible for approximately 13% of all cancer deaths. Average or estimated 5-year survival rates vary dependent on the geographical location and in 2001 they were identified as follows:

Country	%
USA	88%
UK	70%
Australia/New Zealand	63%
Japan	52%
Southeast Asia	41%
China/India	40%

International Statistical Data of Prostate cancer [9]:

I. Epidemiology:

A. Histological evidence of prostate cancer on autopsy:

1. Men over age 50 years: 30%.
2. Men over age 80 years: 70%.

B. Clinical Incidence:

1. Incidence (1997 in U.S.): 334,500.
2. Incidence tripled in last 10 years (PSA detection).
3. Lifetime diagnosis occurs in 9.5% of men.

C. Mortality:

1. Second leading cause of cancer death in men.

   a. Second only to Lung Cancer.

2. Mortality: 41,000 deaths per year in U.S.

3. Mortality increased 24% since 1970s.

II. Risk Factors

A. Age (Incidental finding on Autopsy):

1. Age 50 years: 30% Incidence prostate cancer.
2. Age 60 years: 35% Incidence prostate cancer.
3. Age 70 years: 40% Incidence prostate cancer.
4. Age 80 years: 55% Incidence prostate cancer.
5. Age over 90 years: 100% Incidence prostate cancer.

B. Race:

1. Black race confers twice risk of Caucasian.
2. Caucasian confers twice risk of Asian men.

C. Family History (Relative risk of Prostate Cancer):

1. First degree relative with Prostate Cancer: RR = 3
2. Brother with Prostate Cancer before age 63: RR = 4
3. Sister with Breast Cancer: RR = 2

III. Screening for Prostate Cancer

A. Frequency

1. Annual exam for men aged 50 years and older
2. Annual exam for high risk men aged 40 years and older

B. Testing

1. Digital Rectal Exam
2. See Prostate Specific Antigen (PSA)

IV. Classification

A. See Prostate Cancer Staging (Whitmore Staging)

B. See Prostate Cancer Histological grading (Gleason Score)

V. Complications: Metastasis

A. Spine Metastasis (90% of prostate cancer metastasis)

1. Involves vertebral column in 85% of cases
2. Most often affects lumbar spine
3. Identified 19 months from initial diagnosis
4. Recurrence is common (45% risk within 2 years)

B. Lung Metastasis (50% of prostate cancer metastasis)

1. Identified 35 months from initial diagnosis

C. Liver Metastasis (25% of prostate cancer metastasis)

D. Brain Metastasis (rare)

1. Identified 60 months from initial diagnosis

2. Poor prognosis (average survival 7.6 months)

1. 3 Prostate Problems:

The prostate can play host to a few common problems: Benign Prostatic Hyperplasia (BPH) is characterized by a non-cancerous growth of the prostate, and Prostatitis is an inflammation of the prostate. Both conditions are relatively easy to treat. Prostate cancer, however, is far more serious: currently, it is the leading cancer diagnosed among men in the United States.

Although we know very little about what causes prostate cancer, the medical community has discovered much about how to diagnose it. The prostate produces a substance known as the Prostate Specific Antigen (PSA), a small amount of which continuously leaks into the bloodstream. High levels of PSA can be associated with prostate cancer. Doctors can easily test the level of PSA in your blood. However, some problems can only be diagnosed with a rectal exam, which is why you need a PSA blood test AND a rectal exam annually. While these exams are not foolproof, there is evidence that early detection can be helpful in preventing the spread of cancer.

1. 4. Common Metastatic site:

Cancer cells can spread to almost any part of the body. Cancer cells frequently spread to lymph nodes (rounded masses of lymphatic tissue) near the primary tumor (regional lymph nodes). This is called lymph node

involvement or regional disease. Cancer that spreads to other organs or to lymph nodes far from the primary tumor is called metastatic disease. Doctors sometimes also call this distant disease.

The most common sites of metastasis from solid tumors are the lungs, bones, liver, and brain**.** Some cancers tend to spread to certain parts of the body. For example, lung **cancer** often metastasizes to the brain **or** bones, and Colon cancer frequently spreads to the liver. Prostate cancer tends to spread to the bones. Breast cancer commonly spreads to the bones, lungs, liver, or brain. However, each of these cancers can spread to other parts of the body as well. Because blood cells travel throughout the body, leukemia, multiple myeloma, and lymphoma cells are usually not localized when the cancer is diagnosed. Tumor cells may be found in the blood, several lymph nodes, or other parts of the body such as the liver or bones. This type of spread is not referred to as metastasis.[7, 67-84]

Although, neurologic complications continue to pose problems in patients with metastatic prostate cancer.[9] From 15 to 30 percent of metastases is the result of prostate cancer cells traveling through Batson's plexus to the lumbar spine. Metastatic disease in the lumbar area can cause spinal cord compression. Metastasis to the dura and adjacent parenchyma occurs in 1 to 2 percent of patients with metastatic prostate cancer and is more common in those with tumors that do not respond to hormone-deprivation therapy. Leptomeningeal carcinomatosis, the most frequent form of brain metastasis in prostate cancer, has a grim prognosis. Because neurologic complications of metastatic prostate cancer require prompt treatment, early recognition is important. Physicians should consider metastasis in the differential diagnosis of new-onset low back pain or

headache in men more than 50 years of age. Spinal cord compression requires immediate treatment with intravenously administered corticosteroids and pain relievers, as well as prompts referral to an oncologist for further treatment.

1. 5. Signs and symptoms of prostate cancer:

Having the following signs and symptoms does not necessarily mean you have prostate cancer. They could be caused by other prostate problems, so see your doctor to be sure. Prostate cancer is generally slow growing and may not cause any symptoms for years. Its signs and symptoms are usually divided into 2 groups:

Localized symptoms (involving the prostate gland):

1. Decrease in the size and force of your urinary stream (weak, interrupted flow).
2. difficulty starting (hesitancy) or stopping urine flow (dribbling)
3. Urgent need to urinate.
4. Frequent urination during the day and especially at night (nocturia).
5. Inability to urinate.
6. Blood in your urine (hematuria).
7. Pain during ejaculation.

Generalized symptoms (involving areas where the cancer has spread):

1. Bone pain is the most frequent symptom of cancer that has spread.
2. Aching pain in the lower back, hips, thighs or groin.
3. Weight loss.
4. Constant tiredness.
5. Urinary obstruction and/or retention.
6. Low red blood cell count (anemia).

The prostate gland is located just below the bladder and surrounds the bottom portion of the urethra, the tube that drains urine from the bladder. The prostate's primary function is to produce most of the fluid in semen, including fluid that nourishes and transports sperm.

Most men experience a second period of prostate growth when they reach their mid-40s. At that time, cells in the central portion of the gland -- where the prostate surrounds the urethra -- reproduce more rapidly than normal. As tissues in the area enlarge, they often press on the urethra and partially block urine flow. Benign prostatic hyperplasia is the medical term for this condition, more commonly called BPH, which affects about half of men in their 60s and close to 80 percent of men in their 80s. For some men, the symptoms may be severe enough to require treatment. BPH is not a form of prostate cancer and will not predispose you to developing prostate cancer.

If prostate cancer develops, it may remain in the prostate or spread beyond that gland. If it spreads, it usually spreads to the bones or nearby

lymph nodes. It also may grow locally and invade the bladder. When cancer spreads from its original location to another part of the body, the new tumor has the same abnormal cells as the primary tumor.[85-111]

1. 6 Screening Test for Prostate Cancer:

Screening is looking for Cancer before a person has any symptoms. This can help find cancer at an early stage. When abnormal tissue or cancer is found early, it may be easier to treat. By the time symptoms appear, cancer may have begun to spread.

Scientists are trying to better understand which people are more likely to get certain types of cancer. They also study the things we do and the things around us to see if they cause cancer. This information helps doctors recommend who should be screened for cancer, which screening tests should be used, and how often the tests should be done. It is important to remember that your doctor does not necessarily think you have cancer if he or she suggests a screening test. Screening tests are given when you have no cancer symptoms. Screening tests may be repeated on a regular basis.

If a screening test result is abnormal, you may need to have more tests done to find out if you have cancer. These are called diagnostic tests.[119]

1. 6. 1. Effectiveness and Benefits of Prostate Cancer Screening:

The two most common tests used by physicians to detect prostate cancer are the digital rectal examination (DRE) and the prostate-specific antigen (PSA) test. For the DRE, which has been used for many years, the

physician inserts a gloved finger into the rectum to feel for abnormalities. The prostate-specific antigen test is a blood test that measures the PSA enzyme.

Although there is good evidence that PSA screening can detect early-stage prostate cancer, evidence is mixed and inconclusive about whether early detection improves health outcomes. In addition, prostate cancer screening is associated with important harms. These include the anxiety and follow-up testing occasioned by frequent false-positive results, as well as the complications that can result from treating prostate cancers that, left untreated, might not affect the patient's health.

Since current evidence is insufficient to determine whether the potential benefits of prostate cancer screening outweigh its potential harms, there is no scientific consensus that such screening is beneficial. The position of the Centers for Disease Control and Prevention (CDC) in regard to prostate cancer screening is as follows:

1. CDC promotes informed decision making, which occurs when a man understands the seriousness of prostate cancer; understands the risks, benefits, and alternatives to screening; participates in decision making to the level he wishes; and makes a decision about screening that is consistent with his preferences.

2. CDC supports a man's right to discuss the pros and cons of prostate cancer screening with his physician and to make his own decision about screening.

3. CDC does not recommend routine screening for prostate cancer because there is no scientific consensus on whether screening and treatment of early stage prostate cancer reduces mortality.[113-117]

1. 6. 2. Effect of Screening:

The American Cancer Society and other national medical organizations emphasize the need for routine screening for prostate cancer in men over the age of 50. The serum prostate-specific antigen (PSA) assay is the test most commonly recommended for the purpose of screening. However, when PSA screening is examined critically from the standpoint of the principles of screening, evidence from prospective studies to support the routine use of PSA testing is lacking. Data suggest that screening often detects what may be indolent, non-aggressive prostate cancer. The treatment of such a cancer with radiation or radical prostatectomy can result in significant morbidity, including urinary incontinence and impotence, without a proven decrease in mortality. Evidence from randomized clinical trials in support of routine PSA screening is urgently needed.[118-176]

1. 6. 3 The aims of Screening:

The aims of screening tests are to identify disease in asymptomatic persons at a stage when treatment will alter the natural history of the condition. There is now a widespread call to incorporate routine prostate-specific antigen (PSA) screening for prostate cancer into the care of men over age 50. However, little prospective evidence shows that the benefits of such testing outweigh the risks. The ideal way to assess the efficacy of screening is with prospective randomized clinical trials; unfortunately, no such trial of prostate cancer screening has been conducted.

1. 6. 4. Argument against Prostate Cancer Screening:

Morbidity and Mortality from the Disease Justify Screening!

One must view the evidence favoring prostate cancer screening in the context of the general principles of screening. The first principle is that the morbidity and mortality from the disease must be sufficiently prevalent to justify the screening effort and expense. Prostate cancer is the second leading cause of cancer death in men in the United States. In addition, significant morbidity is associated with end-stage disease. A safe, cost-effective approach to reducing the number of deaths from prostate cancer would seem to be a welcome addition to our efforts to improve health.

The morbidity and mortality resulting from prostate cancer, however, are principally problems of the elderly. Only 8.5 percent of the deaths occur in men younger than 65 years of age; 63.1 percent of the deaths occur in men 75 years of age and older. The popular press would lead one to believe that prostate cancer is often an aggressive, fatal disease in 50-year-old men, but the truth is quite different.

Although a reduction in the mortality rate from prostate cancer in the elderly may be worthwhile, competing causes of mortality are prevalent in the elderly population. A reduction in all-cause mortality, resulting in an actual increase in life expectancy, will be difficult to accomplish in this age group. Advocates of prostate cancer screening suggest that an alternate cause of death is preferable to death from prostate cancer. Yet nothing suggests that men spared death from prostate cancer by early detection and treatment experience a less difficult death from another cause.[177]

1 . 7. Risk Factors Of Prostate Cancer:

Aging and the prostate: Although men of any age can get prostate cancer, it is found most often in men over 50. In fact, more than 70% of all prostate cancers are diagnosed in men over the age of 65. This year, more cases of prostate cancer in men under the age of 65 are expected than the combined number of men of ages who are victims of leukemia, Hodgkin's disease, and brain tumors. As a man gets older, his prostate may increase in size. This condition is called Benign Prostatic Hyperplasia (BPH). By age 70, more than 40% of men will have enlargement of the prostate that can be felt during a physical examination. If the prostate grows large enough, it may press against the urethra and make the flow of urine weaker or slower. An increase in the size of the prostate and a change in urine flow do not necessarily mean you have cancer; you may have BPH, an infection or another urologic condition. It is important to note that BPH is not cancer, nor has it been shown to increase the risk of prostate cancer. However, a man can have both BPH and prostate cancer.

Age: is the most important risk factor for prostate cancer.[10] Data from numerous autopsy studies performed in different countries have shown with remarkable consistency an incidence of occult prostate cancer in 15% to 30% of men over the age of 50.[11-15] By the age of 80 years, as many as 60% to 70% of men have histological evidence of carcinoma in their prostates. [16-19] Interestingly, in one autopsy series, as many as 27% of men in their thirties and 34% in their forties had histological evidence of unsuspected cancer, suggesting that the pathogenesis of prostate cancer may take decades. Nine percent of men in their twenties actually had evidence of prostatic intraepithelial neoplasia.[20] The clinical diagnosis of

prostate cancer also increases directly with age.[21] Before the age of 50, the diagnosis of prostate cancer is rare. From 1991 to 1995, age-adjusted incidence rates of prostate cancer for men under age 65 years was 47.1 per 100,000 men, but was 1,217.8 per 100,000 for men 65 years and older. [22] Prostate cancer incidence increases with age faster than any other epithelial malignancy.

Racial and geographic origin confers variable risk: [1, 23, 24] African-American men have the highest incidence of prostate cancer in the world.[25] SEER data from 1990 to 1995 demonstrates an age-adjusted incidence rate per 100,000 of 224 in African Americans, 150 in whites, and 82 in Asian Americans.[22] In addition, mortality rates for African Americans was double the rate of whites and five times the rate in Asian Americans.[22] African-American men tend to present with more advanced disease and have a worse prognosis in each stage, but it remains unclear if these differences represent genetic, dietary, socioeconomic, or health care access issues. [24, 26-29] The incidence rates for prostate cancer are highest in North America (92.4 per 100,000) and Western Europe (39.6 per 100,000). In Africa, the incidence rate is moderate (5.1 to 31.0 per 100,000), whereas in Asia, rates are low (1.1 per 100,000 in China, 8.5 per 100,000 in Japan). [23, 30] Increased rates of prostate cancer are seen in Japanese immigrants to the United States, which suggests that environmental factors play some role in the geographic differences.[31]

A family history of prostate cancer remains an important risk for developing the disease.[32] Several studies have suggested an increased risk in male relatives of men with prostate cancer. [33-38a] First-degree relatives of men with prostate cancer have a two- to threefold increased risk of

developing prostate cancer compared to the general population. This risk may increase up to tenfold if three or more relatives are affected. [38b] Families with a strong predisposition to prostate cancer have been described, but are uncommon. It has been estimated that about 5 to 10% of all and 40% of early-onset cancers (age at diagnosis less than 50) are hereditary.[37] Genetic linkage studies have implicated several prostate cancer susceptibility loci in families with hereditary prostate cancer; these loci include one on the long arm of chromosome 1 called HPC1 and another on the X chromosome called HPCX.[38c] Several candidate genes have been mapped to the critical region of HPC1, including RNase L, which is a gene encoding an enzyme that regulates cell proliferation and apoptosis. Specific germ line mutations have been detected in RNase L in HPC1 familes, with subsequent loss of heterozygosity and loss of RNase L protein.[38d]

Although prostate cancer is known to be treatable by manipulation of the hormonal milieu, the role of endogenous steroid hormone levels in contributing to prostate cancer risk is more poorly defined. [39] Prolonged exposure to androgens has been proposed as a mechanism by which prostate cancer may develop. In men with chronic liver disease, rates of prostate cancer are disproportionately low; this may be due to the elevated levels of plasma estrogens that suppress testicular androgen secretion, as in all patients with chronic liver disease. A number of epidemiologic studies investigating the role of plasma androgens in the etiology of prostate cancer have shown conflicting results.[40-44] The Health Professionals Follow-up Study, a large prospective analysis, did show a direct relationship between prostate cancer risk and the quartile of serum-free testosterone within the normal range.[45] Also, in a prospective analysis a

germ line variation in the androgen receptor gene (CAG repeat length) was shown to be a significant predictor for aggressive prostate cancer, suggesting that differences in steroid hormone receptors may also play an important role in risk of prostate cancer.[46]

Benign prostatic hyperplasia is often seen in conjunction with cancer, but this association may be incidental rather than causative.[10, 22] Many studies have evaluated vasectomy, with either no added risk [47] or a modest increase (1.5–2.2 ng/ml) in risk for prostate cancer.[48, 49] Detection bias is suspected in such patients, since men seeking vasectomy are also more likely to be screened for cancer. Cigarette smoking also remains an uncertain risk factor for prostate cancer, as data are conflicting.[22] However; two recent studies have suggested an approximately twofold risk of fatal prostate cancer for those who smoke.[50, 51] Higher rates of prostate cancer have been reported in certain occupations, most notably those exposed to cadmium, such as welders.[52] Socioeconomic factors, sexual activity, infections, and a host of other risks have not been associated with prostate cancer.[53]

Diet: has been implicated in prostate cancer risk. In a recent review of the topic, 11 of 17 case-control studies showed a positive association between prostate cancer and fat intake; none showed a negative association.[54] A major difference between dietary habits in Asia and the United States is the lower amount of fat consumed by Asians, a fact that may explain the difference in prostate cancers incidence between the two regions. In the Health Professionals Follow-up Study of 51,000 men, a positive association was seen between the incidence of advanced prostate cancer and intake of red meat, total fat, and animal fat.[55] In a study of men

in Hawaii, a significant association was seen between prostate cancer mortality and dietary fat in men over 70 years old. There are also laboratory data to support this hypothesis. Low-fat diets, fed to nude mice with implanted LNCaP tumors or Dunning rats with prostate cancer, significantly slowed tumor growth. Furthermore, a high-fat diet can induce epithelial hyperproliferation in at least one mouse prostate model.

Another significant difference between Asian and Western diets is the average amount of soy protein consumption, which averages 35 g/d in Taiwan.[54] The soy isoflavones genistein and daidzein are thought to be the active ingredients responsible for the potential benefits of soy. Genistein inhibits growth of both androgen-dependent and -independent cell lines, although the mechanism of such effects is still unclear. It can affect the transcription of estrogen receptors, inhibit phosphorylation of the epidermal growth factor receptor, induce apoptosis through mechanisms involved in cell adhesion, and may even inhibit angiogenesis. Further work needs to be done to understand its effects on prostate cancer growth and its role as dietary inhibitor of prostate cancer development and growth.

Micronutrients in the diet have also been implicated in the pathogenesis of prostate cancer. [53, 56, 57] In the Alpha-Tocopherol, Beta-Carotene Cancer Prevention Study, the incidence of prostate cancer among men receiving 50 IU per day of vitamin E was only 66% of those on placebo. [58] In the Nutritional Prevention of Cancer trial, selenium had no effect on skin cancer risk, but the incidence of prostate cancer in men given 200 micrograms of selenium per day was only 37% that of the placebo group.[59] Recent studies suggest that higher serum vitamin D levels may reduce the risk of prostate cancer. [60a] Schwartz and Hulkas,[60b] showed a relationship with known risk factors for prostate cancer, including age,

race, and living in northern latitudes, which were associated with low serum levels of vitamin D. Others have shown that low serum $1,25(OH)_2$ vitamin D levels correlate with an increased risk of palpable and high-grade tumors. A further link between high dietary calcium intake and prostate cancer risk has been shown, suggesting that chronically high calcium intake might confer risk by causing lower endogenous $1,25(OH)_2$ vitamin D levels.[61]

A variety of carotenoids, including lycopene, inhibit prostate cancer cells in vitro.[54] A higher intake of lycopenes, the agent in tomatoes and beets that gives them their red color, has been shown to decrease risk of prostate cancer.[62] In a large study of food intake and risk of prostate cancer, Giovannucci and colleagues demonstrated an inverse relationship between consumption of lycopenes and the risk of prostate cancer.[63] The major dietary sources of lycopenes are cooked tomatoes, tomato juice, and paste. The role of vitamin A in prostate cancer growth is less established. [64-66] Several ongoing randomized trials are evaluating the role of nutrition in preventing prostate cancer progression, but these results will not be available for years. The largest of these is the Selenium and Vitamin E Cancer Prevention Trial (SELECT), sponsored by the National Cancer Institute. In this placebo-controlled trial, 32,000 men without prostate cancer will be randomized in a 2×2 factorial design to selenium and/or vitamin E.

Many of these risk factors can be avoided. Others, such as family history, cannot be avoided. You can help protect yourself by staying away from known risk factors whenever possible.

Scientists have also studied whether BPH, obesity, smoking, a virus passed through sex, or lack of exercise might increase the risk for prostate

cancer. At this time, these are not clear risk factors. Also, most studies have not found an increased risk of prostate cancer for men who have had a vasectomy. A vasectomy is surgery to cut or tie off the tubes that carry sperm out of the testicles.

1. 8. Diagnosis:

1. 8. 1. Tumor Markers:

Tumor markers are substances produced by tumor cells or by other cells of the body in response to cancer or certain benign (non-cancerous) conditions. These substances can be found in the blood, in the urine, in the tumor tissue, or in other tissues. Different tumor markers are found in different types of cancer, and levels of the same tumor marker can be altered in more than one type of cancer. In addition, tumor marker levels are not altered in all people with cancer, especially if the cancer is early stage. Some tumor marker levels can also be altered in patients with non-cancerous conditions.

To date, researchers have identified more than a dozen substances that seem to be expressed abnormally when some types of cancer are present. Some of these substances are also found in other conditions and diseases. Scientists have not found markers for every type of cancer.[178-187]

Risk markers:

Some people have a greater chance of developing certain types of cancer because of a change, known as a mutation or alteration, in specific genes. The presence of such a change is sometimes called a risk marker. Tests for risk markers can help the doctor to estimate a person’s chance of

developing a certain cancer. Risk markers can indicate that cancer is more likely to occur, whereas tumor markers can indicate the presence of cancer.

Tumor markers used in cancer care:

Tumor markers are used in the detection, diagnosis, and management of some types of cancer. Although an abnormal tumor marker level may suggest cancer, this alone is usually not enough to diagnose cancer. Therefore, measurements of tumor markers are usually combined with other tests, such as a biopsy, to diagnose cancer.

Decrease or return to a normal level may indicate that the cancer is responding to therapy, whereas an increase may indicate that the cancer is not responding. After treatment has ended, tumor marker levels may be used to check for recurrence (cancer that has returned).

Tumor markers measured:

The doctor takes a blood, urine, or tissue sample and sends it to the laboratory, where various methods are used to measure the level of the tumor marker.

If the tumor marker is being used to determine whether a treatment is working or if there is recurrence, the tumor marker levels are often measured over a period of time to see if the levels are increasing or decreasing. Usually these "serial measurements" are more meaningful than a single measurement. Tumor marker levels may be checked at the time of diagnosis; before, during, and after therapy; and then periodically to monitor for recurrence.

Does the NCI have guidelines for the use of tumor markers?

No, the NCI does not have such Gene Tumor marker levels may be measured before treatment to help doctors plan appropriate therapy. In some types of cancer, tumor marker levels reflect the stage (extent) of the disease 0-Tumor marker levels also may be used to check how a patient is responding to treatment. Guideline, however, some organizations do have these guidelines for some types of cancer. Screening tests are a way of detecting cancer early, before there are any symptoms. For a screening test to be helpful, it should have high sensitivity and specificity. Sensitivity refers to the test's ability to identify people who have the disease. Specificity refers to the test's ability to identify people who do not have the disease. Most tumor markers are not sensitive or specific enough to be used for cancer screening.

1. 8. 1. 1 Serum alkaline phosphatase flares in prostate cancer accompanied by bone metastases and treated with hormonal therapy.

1. 8. 1. 2. Acid phosphatase:

Also called acid phosphatase or acid or O or acid p, tase or prostatic acid phosphatase (PAP), a test blood serum to detect specific enzyme produced by several tissues, particularly the prostate. Acid phosphatase levels are elevated in 85% of cases with skeletal metastases, 60% of cases, and 20% of localized cases. PAP is used to measure the acid phosphatase secreted by prostate gland specifically. So it is the primary biochemical test for prostate test before prostate specific antigen and digital rectal examination. However, numerous studies show that PAP has no added benefit once a Prostate Specific Antigen (PSA) has been measured.

Normal range varies according to method of processing the serum as:

King Armstong microns /dl	1-4
Bodansky or Gutman microns/dl	0.5-2
Shinowara microns/ml	0-1.1
Bessy Lowry microns/nk	0.1-0.73

Higher FPSA ratio was associated with more favorable postoperative histopathologic findings for both races.

Lin et al found a significant negative association between pre-operative percent FPSA and total post- operative PSA of patients. This may suggest that patients whose total PSA increases more rapidly post-operatively, are likely to have less percent FPSA Among all other pathological variables, including positive margins,apical margin involvement, periprostatic tissue invasion, capsular invasion, seminal vesicle invasion, bladder- neck invasion, tumor volume and clinical stage, non of them was associated significantly with percent FPSA. The variation in performance of these isoform tests from study to study may be ascribed to differences in test methodology, patient age, prostate size, and cancer prevalence (screening versus urology clinic) . The PSA ratio appears to perform best for patients with prostates smaller than 60 ml The principal clinical use of these isoform measurements is to improve PSA specificity, and there by to reduce by (20-40%) the number of unnecessary negative biopsies when total PSA is borderline (4-10 ug/l), and at minimal (5%) risk of missing a case of cancer. PSA is present in blood with three main forms. The most important immunoreactive form is PSA bound to a- 1 –

antichymotrypsill (PAS-ACT). Free PSA is the other immunoreactive form present in serum. The third form of PSA, bound to a-2- macroglobulin, which cannot be detected.[189]

1. 8. 1. 3. Prostate-specific antigen (PSA) Test:

Prostate-specific antigen (PSA) is a protein produced by the cells of the prostate gland. The PSA test measures the level of PSA in the blood. The doctor takes a blood sample, and the amount of PSA is measured in a laboratory. Because PSA is produced by the body and can be used to detect disease, it is sometimes called a biological marker or tumor marker.

It is normal for men to have low levels of PSA in their blood; however, prostate cancer or benign (not cancerous) conditions can increase PSA levels. As men age, both benign prostate conditions and prostate cancer become more frequent. The most common benign prostate conditions are prostatitis (inflammation of the prostate) and benign prostatic hyperplasia (BPH) (enlargement of the prostate). There is no evidence that prostatitis or BPH cause cancer, but it is possible for a man to have one or both of these conditions and to develop prostate cancer as well.

PSA levels alone do not give doctors enough information to distinguish between benign prostate conditions and cancer. However, the doctor will take the result of the PSA test into account when deciding whether to check further for signs of prostate cancer.

The U.S. Food and Drug Administration (FDA) have approved the PSA test along with a digital rectal exam (DRE) to help detect prostate cancer in men age 50 and older. During a DRE, a doctor inserts a gloved

finger into the rectum and feels the prostate gland through the rectal wall to check for bumps or abnormal areas. Doctors often use the PSA test and DRE as prostate cancer screening tests; together, these tests can help doctors detect prostate cancer in men who have no symptoms of the disease.

The FDA has also approved the PSA test to monitor patients with a history of prostate cancer to see if the cancer has come back (recurred). An elevated PSA level in a patient with a history of prostate cancer does not always mean the cancer has come back. A man should discuss an elevated PSA level with his doctor. The doctor may recommend repeating the PSA test or performing other tests to check for evidence of recurrence.

It is important to note that a man who is receiving hormone therapy for prostate cancer may have a low PSA reading during, or immediately after, treatment. The low level may not be a true measure of PSA activity in the man's body. Men receiving hormone therapy should talk with their doctor, who may advise them to wait a few months after hormone treatment before having a PSA test. In the past, most doctors considered PSA values below 4.0 ng/ml as normal. However, recent research found prostate cancer in men with PSA levels below 4.0 ng/ml. Many doctors are now using the following ranges, with some variation:

0 -- 2.5 ng/ml is low

2.6 -- 10 ng/ml is slightly to moderately elevated

10 -- 19.9 ng/ml is moderately elevated

20 ng/ml or more is significantly elevated

There is no specific normal or abnormal PSA level. However, the higher a man's PSA level, the more likely it is that cancer is present. But because various factors can cause PSA levels to fluctuate, one abnormal PSA test does not necessarily indicate a need for other diagnostic tests. When PSA levels continue to rise over time, other tests may be needed**.** A man should discuss elevated PSA test results with his doctor. There are many possible reasons for an elevated PSA level, including prostate cancer, benign prostate enlargement, inflammation, infection, age, and race. If no other symptoms suggest cancer, the doctor may recommend repeating DRE and PSA tests regularly to watch for any changes. If a man's PSA levels have been increasing or if a suspicious lump is detected during the DRE, the doctor may recommend other tests to determine if there is cancer or another problem in the prostate. A urine test may be used to detect a urinary tract infection or blood in the urine. The doctor may recommend imaging tests, such as ultrasound (a test in which high-frequency sound waves are used to obtain images of the kidneys and bladder), x-rays, or Cytoscopy (a procedure in which a doctor looks into the urethra and bladder through a thin, lighted tube). Medicine or surgery may be recommended if the problem is BPH or an infection.

If cancer is suspected, a biopsy is needed to determine if cancer is present in the prostate. During a biopsy, samples of prostate tissue are removed, usually with a needle, and viewed under a microscope. The doctor may use ultrasound to view the prostate during the biopsy, but ultrasound cannot be used alone to tell if cancer is present.[190-191]

Limitations of the PSA test?

Detection does not always mean saving lives:

Even though the PSA test can detect small tumors, finding a small tumor does not necessarily reduce a man's chance of dying from prostate cancer. PSA testing may identify very slow-growing tumors that are unlikely to threaten a man's life. Also, PSA testing may not help a man with a fast-growing or aggressive cancer that has already spread to other parts of his body before being detected.

False positive tests: False positive test results (also called false positives) occur when the PSA level is elevated but no cancer is actually present. False positives may lead to additional medical procedures that have potential risks and significant financial costs and can create anxiety for the patient and his family. Most men with an elevated PSA test turn out not to have cancer; only 25 to 30 percent of men who have a biopsy due to elevated PSA levels actually have prostate cancer.

False negative tests: False negative test results (also called false negatives) occur when the PSA level is in the normal range even though prostate cancer is actually present. Most prostate cancers are slow-growing and may exist for decades before they are large enough to cause symptoms. Subsequent PSA tests may indicate a problem before the disease progresses significantly.

1. 8. 1. 3. 1. PSA Isoforms:

The different forms of PSA have been used as ratio of free PSA (FPSA) to total PSA and the measurement of the bound form only,

complexed PSA (CPSA). These tests have been reported to give better discrimination between benign and malignant disease of the prostate. Brawer reported that FPSA ratio and CPSA identify slightly different patient groups. CPSA has much better storage stability than PSA, both at 4 and at 20, which could be its main advantage. The poorer stability of free PSA causes problems for laboratories wishing to measure total PSA initially, and store the sample until the physician requests the f PSA ratio at a later date.

Catalona et al. found that 95% sensitivity was maintained with a f PSA ratio of 25% in both black and white men. Use of this cutoff avoided unnecessary biopsies in 20% of white and 17% of black.

1. 8. 1. 3. 2. Age Relative PSA Cutoff:

For total PSA> 7ug/l, FPSA ratio and CPSA were equivalent to each other, and better than total PSA. The original cutoff of 4.0 ug/l was defined by Hypritech method as the 99th percentile of (mostly white) men under the age of 40 years without benign prostatic hyperplasia (established by lack of symptoms rather than biopsy). The test characteristics of PSA are different for black men than for white men. The percentage of patients with PSA > 4ug/l is age dependent because prostate size increases with age. Computer simulation suggests a 2- year screening interval starting at age 40 years leads to fewer prostate cancer deaths, fewer PSA tests and fewer biopsies per curable cancer. Lowering the cutoff even to 2.5 ug/l, did not prevent more deaths from prostate cancer than a cutoff of 4.0 ug/l, but lead to more biopsies. The value of PSA taken to indicate biopsy is age – related. Even in the range of 0-4 ng/ ml, a significant number of tumors can be found. Given that prostate cancer is so common at autopsy, and that a tumor of

volume less than l ml is not likely to result in raised PSA, it may be that many tumors are simply found by chance in men with raised PSA, the concentration of PSA being related to the amount of BPH. Age- related reference ranges compensate for BPH in an indirect manner, and lead to decreased clinical sensitivity for the test in order men, and increased sensitivity in younger men. Some have argued that this is beneficial, since younger men need to be identified because of the possibility of grater number of life years lost, and older men have fewer life years to lose, However, other have pointed out that the (PPV) prostatic positive of PSA does not change with age, because sensitivity increases with age (due to the larger tumors usually detected), whereas specificity decreases with increasing age (due to increased prevalence of BPH). Using a standard cutoff of 4.0 ug/l, the overall cancer detection rate is higher than with age – adjusted cutoffs.

The target population for screening should be <75 years, and the point out that the screen interval will have little effect on men >65 years if the initial PSA is < 1.0 ug/l. In other words, these men probably do not to be screened again.[108] Increased cancer in men>70 years was offset by decreased yield in men aged 50-59 years.[88] This suggests that screening programs need to be more targeted at younger men.

1. 8. 1. 3. 3 Importance of PSA:

As we know that the prevalence and incidence of prostate cancer increase as men get older. This has led some to suggest that screening with PSA should begin at age 50 years, unless there are other risk factors (family history or African ancestry) when age 40 years is suggested.[67] However, there is no direct evidence that screening these two high- risk

groups leads to improved life expectancy. The main goal of PSA screening is to detect potentially curable disease in the hope of curative treatment to reduce mortality. The velocity attempts to document the rate of increase in PSA over time, based on date from specimens that showed rates in the following order:

Metastatic PC > localized PC > BPH> Healthy men.

Sometimes, the approach is called PSA doubling time, the time taken for serum PSA to double in concentration. Aggressive PC usually has doubling times of less than 2 years. Both of these approaches are hampered by the significant amount of within- subject variation, which varies from 6% to 40% in different studies. The rate of progression to incurable cancer (defined as patients with initially “normal" PSA conversion to PSA > 5.0 ug/L after 2 or 4 years) was rare; (49) that is the patient had an initial PSA < 2.0 ug/L.

Conversion was more likely for patients with initial PSA between 2.1 and 3.0 ug/l (27%) and still more likely for initial PSA between 3.1 and 4.0 ug/l (36%). This confirms both a 2- years screening interval and that PSA< 2.0 u/L carries a very low risk of prostate cancer progression over 4 year. Little difference was found in the probability of organ- confined cancer at PSA concentration between 2.5 and 4.0 u/L compared with concentration between 4.0 and 6.0 ug/L for men of various ages.[111] However, probability of organ- confined prostate cancer was higher in younger men at all PSA ranges, concluding that for greater benefit in screening at an earlier age than there is in using lower cutoff for further testing. With pretreatment PSA< 4.0 ug/l, there was a high probability (94%) of potentially curable cancer, most of which (69%) were small

(volume >0.5 ml). For PSA in the range 4.0 -5.0 ug/l, 89% of cancers were deemed curable (only 33% had volume < 0.5 ml); and for PSA > 5.0 ug/, only 70% were potentially curable.[111] They interpret this data as support cutoff PSA > 4.0 ug/l for detecting potentially curable prostate cancer. In summary, PSA testing leads to an increased biopsy rate and to an increase in prostate cancer detection. The absolute increase in potentially curable prostate cancer with PSA over use of DRE is significant.

1. 8. 1. 3. 4. PSA with Other Examination:

The main outcome of PSA testing is a thin core biopsy. Thin core biopsy material is stained and evaluated according to the Gleason pattern from Grad 1 (well differentiated, less aggressive in metastatic behavior) through III (poorly differentiated, more likely to metastasis). Because more than one grade is often present, the Gleason score has developed, in which the most common pattern and the pattern and the pattern of highest grade are combined to give score out of 10. Between 10% and 21% of patients with PSA < 4 ug/l would not have prostate cancer diagnosed without a digital rectal examination (DRE), unless a lower cutoff for PSA is used, it is for this reason that most screening programs advocate the use of both PSA and DRE. On the other hand, when both DRE and PSA are positive, the probability of prostate cancer quite high about 55%.

Adding digital rectal examination (DRE) to measurement of serum PSA, in the context of screening asymptomatic men, does little to increase sensitivity.[114] Other researchers have shown that omission of rectal examination will result in some tumors being missed. A logistic regression model was used to predict the number of cancers if all men were to

undergo biopsy. The study found that biopsies in men with PSA < 1.0 ng/l and positive DRE or TRUS would be insufficient because few tumors are detected.

PSA density, volume – related PSA, and transition zone PSA all rely on an estimate of the volume of the prostate to compensate for the amount of PSA present in benign tissue in the prostate. They all suffer from operator (and method) variability estimating the volume of the prostate, usually with TRUS. They are also affected by the different ratio of epithelium to stroma in prostate tissue. This ratio varies with prostate size, and alters the above measurements because only the epithelium produces PSA.

A promising marker is a member of the human kallikerin (HK) family, of which PSA is a member. HK- 2 has been shown to perform better than PSA and present age free prostate specific antigen (FPSA) ratio in a number of studies. Unfortunately, it is not readily available, and it is true clinical utility needs further exploration.

In summary, PSA together with DRE is a reasonable screening approach for detection of prostate cancer. However, the true sensitivity and specify are not known, and with the current standard cutoff of 4 ug /l, a significant number of cancers is missed.

1. 8. 1. 3. 5. Problems with PSA Assay:

Since Benign Prostatic Hyperplasia (BPH) is about 3- fold more prevalent than prostate cancer, this causes significant problems with PSA specificity for diagnosing prostate cancer. Many other factors can cause false- positive for the PSA test when used to screen for cancer, [119]

including a statistically significant increase after digital rectal examination, and a clinically significant increase after prostate biopsy necessitating to wait of 1-2 months before taking another PSA measurement. Study by Perron et al,[109] document increases in PSA after strenuous bicycle riding and after ejaculation, but anti-androgen drugs like Finasteride cause an average of 50% decline in PSA concentration after about 6 months of use to treat BPH; but the free – to – total PSA ratio is unaffected.

There have been some analytical problems with the PSA assay, some of which still persist. Most of the problems relate to existence of different isoforms of the enzyme. Agreement among PSA assays is be better that most companies trace their calibrators either to the original hybritech method, or to the Stanford "90-10" calibrator. This calibrator more closely approximates the PSA isoform composition in serum in patients with prostate cancer, where it is about 10% free (unattached to other proteins) and 90% bound (to a-l antichmotrpsin). Use of this calibrator has been shown to reduce differences among methods.[121] The difference arise in part from different incubation ; short incubation times favor binding of free PSA to the capture antibody, and bias the final result in specimens having extremes in proportions of free PSA . A alternatively, there may be recognition of different epitiopes on free and bound PSA, depending on the antibody used in the assay. Methods that show a differential response towards free versus bound PSA are sometimes called "non-equimolar", because they do not give the same signal for both forms of PSA.

1. 8. 1. 4 Prostate- Specific Membrane Antigen (PSMA):

Prostate- specific membrane antigen is expressed in epithelial cells of both benign and cancerous prostate tissue. It is up regulated in hormone

– resistant states, and where there is tumor invasion. Current Wisdom[123] suggests that serum PSMA can assist in the identification, staging, and monitoring of metastatic prostate cancer. It shows promise in directed imaging and therapy of recurrent prostate cancer. But its role is not yet firmly enough established to be recommended routinely. Detection of circulating prostate cancer cells by reverse transcription – polymerase chain reaction (RT- PCR) held much promise as a very sensitive approach to detect the presence of metastases. These cells are detectable in virtually all lymph node metastases. However, these cells are detected in serum of patients with both localized and Meta second leading cause of cancer death in men (exceeded only by lung cancer). Static disease, making distinction between these two states not possible Furthermore, there are significant analytical problems among laboratories, which preclude its routine use.

1. 8. 1. 5. Tissue Polypeptide Antigen (TPA):

It is a non – specific to prostate cancer, elevated levels indicate presence of malignancy also used to monitor bladder and lung cancer in males.[192-193]

1. 8. 1. 6 Other Tumor Markers:

Despite the widespread use of PSA screening, derivations there of (FPSA), and molecular marker models, such as the prostatic specific membrane antigen, prostatic acid phosphate, alkaline phosohatase. These tests do not offer optimal specificity and sensitivity required for sophisticated clinical decision making. It becomes increasingly apparent that the search for a single specific tumor marker for prostate cancer may have a low probability of success particularly when the model systems consist of cell lines or animal tumor models.

The variable extend to which the parameters mentioned antecedent have been found to be prognostic, has led to a number of studies of combined markers, including the use of logistic regression; including genetic markers . There has been considerable effort devoted to searching for genetic markers to identify patients at risk for prostate cancer and to try to predict which cancers are likely to progress more rapidly than others. Scharder, group in Rotterdam has identified chromosomal regions related to advanced tumor stage, that is loss of 10q 24 and gain of 7 q 11.2 and /or 7q 31 sequences. Also again of 7pq and/ or 89 was suggested to discriminate between progresses and non-progresses. Increased concentrations of insulin – like growth factor- 1(IGF-I) are associated with high relative risk for prostate cancer. Low concentrations of P27 have been reported to predict for poor disease- free survival,[130] however, none of these markers has reached the point of routine clinical use.

The development of rational approaches to the diagnosis and treatment of prostate cancer may start with a basic understanding of the molecular mechanisms that underlie tumor progression. Gene sequence alone cannot predict functional consequences that are ultimately reflected in the actual protein contents within the cell. A normal communication between these proteins trigger signal transduction pathways that determine whether a cell remains quiescent, proliferate, differentiate, commits programmed cell death, adapts to a differentiated state, or migrates. It is envisioned that information regarding proteins governing these processes will likely reveal new drug targets, markers for early detection, or vaccine candidates if the protein is surface expressed.

Discerning the mechanism whereby normal cells transform into pre-malignant cells, then into tumor cells, and finally into metastatic dissemination can best be understood if the analysis is performed in the

actual tissue itself. This is a particularly challenging problem in the study of prostate cancer because relevant cell population (i.e,no second leading cause of cancer death in men (exceeded only by lung cancer). Prostatic intraepithelial neoplasia, frankly invasive) only constitute a small fraction of the whole cellular repertoire, thereby effectively limiting traditional proteomic (the analysis and characterization of global protein modifications) investigations, such as two-dimensional electrophoresis (2d- PAGE) of homogenized prostate bulk tissue or cell lines. It is not clear whether gene or protein expression changes seen in prostate tumor progression are causal, a result of the malignancy itself, or are contributed by inter patient variability.[131] The extension of this technology to construct sensitive, specific, and reproducible protein profiles that span progressions of a variety of malignancies from micro-dissected samples was validated just recently, although a powerful technique for the discovery of novel proteins not amenable to rapidly assessing changes in protein expression in a clinical setting

1. 8. 2. Physical Examination:

1. 8. 2. 1 Digital Rectal Examination (DRE):

Also it may called rectal examination, and manual examination; we can make examination for lower portion of the rectum, perineum and surrounding tissues using a gloved finger inserted into the anus to examine the presence of nodularity, in duration, fixation of seminal vesicles, enlargement, firmness, lesion, malignancy and active bleeding. If there is no mention of prostatic abnormality during the exam; benign prostatic hypertrophy will be considered.

As we mentioned antecedent that screening with DRE and PSA should begin at age 50 years. Also as we called previously that between 10% and 21% of patients with PSA <4ug/1 would not have prostate cancer diagnosed without DRE. It is for this reason that most screening programs advocate the use the use of both PSA and DRE. According to American Cancer Society (ACS) project, DRE sensitivity decreased from about 48% in the first two years of screening to about 25% in the third and fourth years, whereas PSA sensitivity increased slightly during the same time period from 65% to 69%. DRE and PSA specificity remained fairly constant at 97% and 89%, respectively.

Finally, urologists tend to be better at DRE procedure and family physicians less good at it. The large variability in performance mediates against DRE as the sole screening test for prostate cancer.

1. 8. 3 Imaging:

1. 8. 3. 1 Prostatic Ultrasound:

Prostatic ultrasound may also call transrectal ultrasound (TRUS), ultrasonography, echography, sonography. It is a recently developed technique to locate areas of carcinoma within the prostate and to assess whether the prostatic capsule is intact. This procedure can not assess lymph node size, but may be in guiding needle biopsies.

Most of the studied tested with PSA, DRE, and TRUS; however, the criteria of going to biopsy differed. Some screened with PSA first, and performed DRE and TRUS only if PSA was elevated (> 4.0ug/l). Some allowed either PSA or DRE (or both) to be positive before performing TRUS and biopsy; other required both to be abnormal. Because a

procedure by means of TRUS results in sepsis and haematuria TRUS is generally not regarded as a useful screening test. Brawer cites ll studies on TRUS. He documented the poor sensitivity, expressed as mean as mean number of cancers per number of patients tested (9.7 % rang 1.7-21.6%) and the poor specificity of TRUS as a screening tool. [195-197]

1. 8. 4. Epidemiology:

prostate cancer depending on cell type, Gleason's grade or score, exact size of lesion, number of microscopic foci (if tumor is occult), multifocal tumor, nodularity in both lobes of prostate, invasion into or through the prostatic capsule, invasion of apex of prostate, size and number of lymph nodes involved (including micro-metastases), structures removed (duct's deferens, seminal vesicles, prostatic urethra), extension to adjacent tissues (seminal vesicles, rectum, bladder neck, floor of bladder, urethra, perineum, soft tissues) results of biopsies of distant sites or lymph nodes. Transrectal/ transperineal Needle Biopsy is a procedure performed by inserting a needle through the perineum (external) or via the rectum through the rectal wall to penetrate areas of nodularity or induration of prostate. Fluid or tissue suitable for cytologic analysis is drawn up into the needle, which is with drawn from the prostate. Multiple random needle biopsies may be performed to determine is multi-focal. [198-212]

1. 8. 4. 1. Prostate Cancer Staging:

Epstein et al. compared cancers detected either by TURP (TIA) PSA (TIC) (in which both TIa, Tic is nonpalpabe incidental PC) to palpable T2 cases. Only 16% of T1c tumors were considered to be clinically "insignificant" (defined by volume < 0.2 cm3 organ confined, and Gleason

score < 7). The Tic cancers were intermediate between TIa and T2 in the various pathology attributes.

The European Screening Trial divided cancers into Tic and non – Tic, and latter into groups with elevated or "normal" PSA (cutoff 4.0 ug/I). The Tic tumors were intermediate between the two PSA groups in terms of being organ- confined and the extent of positive surgical margins; there was no seminal vesicle involvement unless PSA is > 4.0 ug/I.

We have brief summaries of prostate cancer staging as:

1- TO: No evidence of primary.

2- TI: not palpable or visible (clinically in apparent)

TIa <5%

TIb>5%

Tic Diagnosed on needle biopsy only

3- T2: confined to prostate gland

T2a: one lobe

T2b: both lobes

4- T3: Through prostate capsule

T3b: seminal vesicle (s).

5- T4: Fixed or invading adjacent structures bladder neck, external sphincter, rectum, elevator muscle, pelvic wall.

6- N-M: Distant metastases.

N1: Regional lymph node (s).

Mia: Non- regional lymph node (s).

MIb: Bone (s).

MIc: Other site (s). [213-215]

1. 8 .4 .2 Gleason's Score/System for Histological Grading of Prostate Cancer:

Gleason's system assigns histological grade to predominate (primary) and lesser (secondary) pattern of tumor.

The grade number of histological grade (which is important factor for prostate cancer raging from (1-4)) are added to Gleason Pattern (ranging (1-5) are added to obtain Gleason score (ranging (2-10)) as the following: -

1- Grade I (GI): well differentiated, slight anaplasia.

Gleason's pattern 1: small, uniform gland.

And 2: more stroma between glands.

Gleason's score: 2, 3, 4.

2- Grade 2 (GII): -moderately differentiated, moderate anaplasia.

Gleason's pattern 3: distinctly infiltrative margins

Gleason's score 5, 6, 7

3- Grade 3-4 (G III-IV): poorly differentiated or undifferentiated, Anaplastic, marked anaplasia

Gleason's pattern 4; irregular masses of neoplastic glands

Gleason's pattern 5: only occasional gland formation.[216-235]

1. 9. Treatment:

Because prostate cancer usually develops deep in the parenchyma of the gland, complete resection of tumor is not possible through a transurethral approach, which simply cores out or scrapes away the tissue adjacent to the urethra. Once prostate cancer has been identified, a strategy is needed to provide guidance on appropriate treatment.[236]

1. 9 .1. Type of treatments:

There are six main treatments for localized prostate cancer:

1. Radical prostatectomy.
2. Radiation therapy.
3. Conservation monitoring.
4. Hormonal therapy.
5. Immunotherapy.
6. Chemotherapy.

1. 9. 1. 1 Radical Prostatectomy (RP):

Also called transurethral resection of prostate (TURP); in which used primarily to relieve bladder outlet obstruction symptoms and evaluate the urethral passage. It is generally not considered to be cancer- directed therapy except in very low stage disease. Given the long natural history,

and the acceptance that the possible benefits of radical local treatment may be apparent only after 15 to 20 years. Some advocates of radical prostatectomy point out that most benefit will be gained in the treatment of younger men aged under 55 or 60 years.

Kamoi and Babaian cite radical prostatectomy data for patients identified by and increased PSA concentration (> 4.0 ug/1). About 90% of these patients had tumors >0.5ml in size, suggesting that they should be considered for treatment.

Also the resection includes prostate, lymph nodes, ducts and seminal vesicles, bladder organ as testes which called orchiectomy. In cases of removing gland to change the hormonal balance of the body called hormone manipulation surgeries.

Prostate cancer incidence rose rapidly in the years when TURP rates also increased rapidly (1970s and 1980s), and subsequently declined as TRUP rates were reduced with the introduction of the drugs and minimally invasive therapies for benign prostatic disease.[237-240]

1. 9. 1. 2. Radiation Therapy (RR):

Radiation therapy is commonly used for high grade, large, of extracapsular tumors. It is also effective in treating symptoms of metastatic disease. At present we have no high quality evidence that assesses the effectiveness and cost effectiveness of treatments. There are some data to suggest that radical treatment of organ-confined cancer can lead to a small increase in long – term survival, but without confirmatory evidence from randomized controlled trails, such data can not be relied upon.

Most studies have found that there is a higher death rate (though it is small), and higher rates of impotence and urinary incontinence after prostatectomy (RP) than after radical radiotherapy (RR). RR is usually recommended if there is evidence of local spread before treatment, and may be recommended for local spread RP.

In addition to the lack of good quality evidence of survival after radical treatment, very little research has been conducted on short-term of medium-term outcome, which are likely to have a severe impact upon quality of life. One study found considerably worse sexual and urinary dysfunction among those who received radical interventions than among those treated conservatively.

1. 9. 1. 3 Conservative Monitoring (Watchful Waiting):

It involves close monitoring with active treatment if symptoms develop. Future changes may incorporate molecular markers of progression, which will allow the identification of men best treated by watchful waiting because of their low risk, and men at greater risk who might benefit from major interventions.

Active treatments offer potential for cure, they involve iatrogenic effect, including pain, hospital admission, incontinence impotence, and occasionally death. In some men in whom the cancer would not have caused morbidity or mortality, the patient may experience harmful side effects without benefit. On the other hand, with conservative monitoring, the patient is at risk of progression, which may be fatal in small number of cases.

1. 9. 1. 4. Hormonal Therapy (HT):

There is a suggestion from a small randomized trial early hormonal ablation in men with low-volume lymph-mode metastases found at radical prostatectomy far better after such treatment. These data are in keeping with the randomized trial of hormonal ablation in men treated with radiotherapy, though this study did not address the question of whether hormonal ablation alone would have provided better treatment than local radiotherapy. There is large number of drugs related to hormonal therapy commonly used for treating prostate cancer:

1. in metastatasis disease initial therapy (hormone-sensitive disease).
2. castration,bilateral orchiectomy the most cost-effective to hormonal blockade.
3. luteinizing hormone –releasing hormone (LHRH) agonists are the most commonly used first –line therapies. Lupron(7.5mg s.c. monthly)
4. second line antiandrogens. Bicalutimide, 50 mg daily, nilutimide 150 mg daily, flutamide 250 mg daily 3 times daily.
5. Diethylstilbestrol at doses less than 3 mg daily but this medication may be with side effect of thrombotic events..
6. Ketoconazole at dosesup to 1,200 mg/day in three divided doses in concert with hydrocortisone, this medication may reduce size of tumor after first line of treatment failure seen in cord compression.[241]

1. 9. 1. 5. Immunotherapy (I.T):

A number of novel treatments are now being developed, based on immunotherapy and agents active against receptor tyrosine kinases.[243-249]

1. 9. 1. 6. Chemotherapy (CT):

Secondary therapy (hormone-refractory disease).

1. cyclophsphamide oral tab. Based regimens
2. mitoxantrone 14 mg /m2 every 3 weeks in combination with hydrocortisone given orally, 30 mg morning, and 10 mg evening
3. Estramustine, acombination of estradiol and nornitrogene mustard, may have toxicity as nausea,vomiting, and venous and arterial thrombosis due to the estrogenic effects
4. estramustine, 600 mg/m2/week plus vinblastine 4 mg/m2/week may be given in 6 consecutive weeks in every 8 weeks
5. alternatively, estramustine, 15 mg/kg/day, plus etoposide, 50 mg/ m2/ day for 21 days, chemotherapy repeat every 28 days.
6. Estramustine combined with docetaxel,this inactivates the antiapoptotic protein Bcl-2 by phosphorylation.
7. the combination of paclitaxel (taxol), estramustine, and carboplatin (TEC) has activity in hormone- resistant disease, it is administered as paclitaxel, 60 to 100 mg, iv, over 1 hour weekly, oral estramustine, 10 mg /kg daily in three divided doses 5 days a week, and carboplatin 6 mg/ml/minute every 4 weeks .[250]

1. 9. 1 .7 Outcomes of Treatments

The result of different types of treatment in the management of men with localized prostate cancer is difficult to interrupt, because no randomized data are available. For instance, men treated by watchful waiting tend to have been selected because they by radiotherapy are more likely to have more advanced tumors. The main outcomes of treatment can be viewed as life expectancy (years of survival after diagnosis), morbidity, and quality of life (QOL).

1. 9. 1 .7. 1. Life Expectancy:

We do not know which treatment offers the best survival in the majority of circumstances for prostate cancer. In USA, urologists are more likely to recommend radical prostatectomy, and radiation oncologists to recommend radiation therapy, for organ-confined disease. In Europe, watchful waiting is still the most prevalent treatment, and radical prostatectomy has been decreasing in recent years in Sweden.

The difference in survival by different methods of treatment were not statistically significant, except for Grade 3 (Gleason scores 8-10) However, it must be remembered that these data are not strictly comparable because patient pre-selection usually guides which treatment is offered, and only some of the significant prognostic factors could be corrected for in the analysis. Wasson et al found no evidence sufficiently good to support one treatment over another for localized prostate cancer.

1. 9. 1 .7. 2. Morbidity:

Morbidity experienced by patients from these treatments includes impotence, urinary incontinence, and there is even a risk of death.

1. 9. 1. 7. 3. Quality of life:

More attention is now being paid to quality of life issues. At least two independent decision analytic publications on this point indicate minimal benefit for PSA screening in terms of life expectancy, and negative benefit in terms of quality-adjusted life years (QALYs), which take into account quality in addition to quantity of life (95.96) The outcomes of these analyses are only as good as the inputs, which are far from definitive, such as natural history of disease, outcomes of treatments, morbidity, and QOL.

QOL issues were an important driving force in the choices to be made by patients, especially attitudes towards sexual function and risk-taking. The test performance characteristics of PSA and DRE were less important than these other parameters determining benefit to the patient.

1. 9. 2 Treatment Options by stage:

There are five different stage of disease require different treatment ways there are:

Stage A1 (Occult):

Observation without immediate treatment. But if the patient is younger (age 50-60) immediate treatment may be considered.

1) **Stage A2 (diffuse tumor):**

    a) External beam radiation therapy following transurethral resection.

    b) Radical prostatectomy with pelvic lymphadenectomy.

c) Interstial radioisotopes (under clinical evaluation).

2) Stage B (palpable prostate tumor at diagnosis)

a) Radical prostatectomy with pelvic lymphadenectomy.

b) External beam radiation therapy following transurethral resection.

c) Interstial radioisotopes (under clinical evaluation).

3) Stage C (extra-capsular extension)

b) External beam radiation therapy transurethral resection (for cure).

c) Radical prostatectomy with pelvic lymphadenectomy in selected patients (for cure).

d) Orchiectomy for symptomatic patients.

e) Transurethral resection (for palliation).

f) Hormone therapy (leuprolide or estrogens)

g) Interstitial radioisotopes (under clinical evalutation).

4) Stage D1 (regional lymph node involvement, distant metastases): -

a) Orchiectomy.

b) Hormone therapy: signal agents of combination.

c) Transurethral resection or radiation therapy (for palliation).

d) Systemic chemotherapy (under clinical evaluation). 254

CHAPTER TWO

Prostate Cancer among Palestinian population:

Medical research is very rare in Palestine, especially in country under occupation where the field of research remains in last list of the population needs, where resources are very low. We attempt to investigate the frequency of Prostate cancer among the Palestinian population. In hope to increase the wakefulness and the early dedication of the disease in its first steps, by encouraging population at risk who had a relative or family members suffered or still suffering from prostate cancer to take awareness and to examine himself frequently. The early prevention is the cornerstone to fight the disease early with better prognosis. Giving information to the community may reduce the number of patients with prostrate cancer.

It is well known that prostate cancer considered the second lethal disease that lead to death worldwide after skin cancer, for example, in United State every year appear 200.000 case, and this differ from country to another and from race to race. Also, in South Africa the frequency of the disease is higher than the State; this may be related to race differences, genetic variations, and geographical, socioeconomic and dietary habits between populations.

In Palestine – As we know the higher prevalence of prostate cancer was observed during 1992-2002 (28.9 per 100.000 populations). The highest incidence rates of the prostate cancer were found in Bathlehem and Nablus (46.2 and 46.1) per 100.000 respectively, followed by Jerico 42 per 100.000, Hrebron 38 per 100.000, where as Jerusalem is the lowest 3.5 per 100.000. The high frequency observed during theses years may be related to different reasons- Firstly: The difficulty to diagnosis the disease in the local clinics surrounding theses town because of the military siege and the

occupation. Secondly; the low socioeconomic situation during the intefada that cause poor medical attention. Thirdly; no sufficient specialists in this field of study. Fourthly; the illiteracy and low awareness among the population increase not only the risk but also the manifestation of the different diseases and especially the prostate cancer.

CHAPTER THREE

Result and Discussion:

To extent the effectiveness of our study we are going to use two different approaches: In the first approach we propose a negative hypothesis: No correlation or statistical significant relationship between the different variables (risk factors) and Prostate Cancer exist at the significant level of (P- value = 0.05). In contrary in the second approach we are going to propose and examine the positive hypothesis (positive relationship) between theses variables and the prostate cancer. We are using Tables, Bars and Figures to explain our data and in the end we clarify our results by discussion of our hypothesis. To do that we firstly listed the negative suggestions:

1. There exists no significant relationship, in the significant level 0.05, between the grade of CA prostate and smoking.
2. There exists no significant relationship, in the significant level 0.05, between the grade of CA prostate and infection
3. There exists no significant relationship, in the significant level 0.05, between the grade of CA prostate and occupation.
4. There exists no significant relationship, in the significant level 0.05, between the grade of CA prostate and N° . of children.
5. There exists no significant relationship, in the significant level 0.05, between the grade of CA prostate and age.
6. There exists no significant relationship, in the significant level 0.05, between the stage of CA prostate and smoking.

7. There exists no significant relationship, in the significant level 0.05, between the stage of CA prostate and occupation.

8. There exists no significant relationship, in the significant level 0.05, between the stage of CA prostate and N° of children.

9. There exists no significant relationship, in the significant level 0.05, between the stage of CA prostate and age.

10. There exists no significant relationship, in the significant level 0.05, between the PSA categorized and smoking

11. There exists no significant relationship, in the significant level 0.05, between the PSA categorized and stage.

12. There exists no significant relationship, in the significant level 0.05, between the PSA categorized and grade.

13. There exists no significant relationship, in the significant level 0.05, between the age and infection.

14. There exists no significant relationship, in the significant level 0.05, between the PSA categorized and age

15. There exists no significant relationship, in the significant level 0.05, between the PSA categorized and the occupation

16. There exists no significant relationship, in the significant level 0.05, between the PSA categorized and N° of children

17. There exists no significant differences, in the significant level 0.05, between the stage and the age

The distribution of the study sample includes eleven main categories (risk factors!):

- Family History (F.H)
- Place
- Smoking or not
- Infection
- Date of star
- Stage
- Grade
- Occupation
- N°. children
- age
- PSA categories

The Tables below shows the frequencies and the percentages of the study sample:

Table 1: Relationship between family history and prostate cancer.

Family History			
		Frequency	**Percent**
Valid	Brother	2	2.6
	Brother: Lung Cancer	4	5.1
	Father: Prostate Cancer	1	1.3
	Mother: Breast Cancer	4	5.1
	Total	11	14.1
Missing	**System**	67	85.9
Total		78	100.0

We notify from the Table 1 that the highest percent of cancers observed in families under study are for brother with lung carcinoma and among mother with breast cancer (5.1% vs. 5.1% respectively).

Table 2: The distribution of Prostate cancer's in different cities in West-Bank, 1998-2006.

Prostate cancer cases according to Residence, 1998-2006.			
		Frequency	**Percent**
Valid	Nablus city	51	65.4
	Jenin city	14	17.9
	Qalqelia town	8	10.3
	tulkarem city	5	6.4
	Total	78	100.0

Table 2, shows the distribution of Prostate Carcinomas in different towns in West-Bank: the highest percentage frequency were observed in Nablus city with percent 65.4% and then in Jenin city with percent 17.9%, followed by Qalqelia town 10.3% and finally tulkarem city 6.4%.

Table 3: The distribution of Prostate cancer's in different West-Bank towns. Data from 1992-2002.

Prostate cancer cases for 1992-2002, according to Residence			
		Frequency	**Percent**
Valid	Nablus city	76	48.4
	Jenin city	26	16.6
	Tulkarem city	20	15
	Qalqelia town	11	**7**
	Total	133	100.0

Comparison between the results of prostate cancer conducted at 1998-2006, Table-2 with the results already observed at 1992-2002, (Table-3), in different west bank towns. We observed a remarkable increase in prostate cancer frequency, especially in Nablus town (64.1% vs. 48.4%, respectively). We also observed an increase cancer frequency in other two towns: Jenin (17.9% vs. 16.6%) and Qalqelia (7% vs. 10.3%), respectively, but it was notable decrease in frequencies in Toulqarim Town (6.4% vs. 15%).

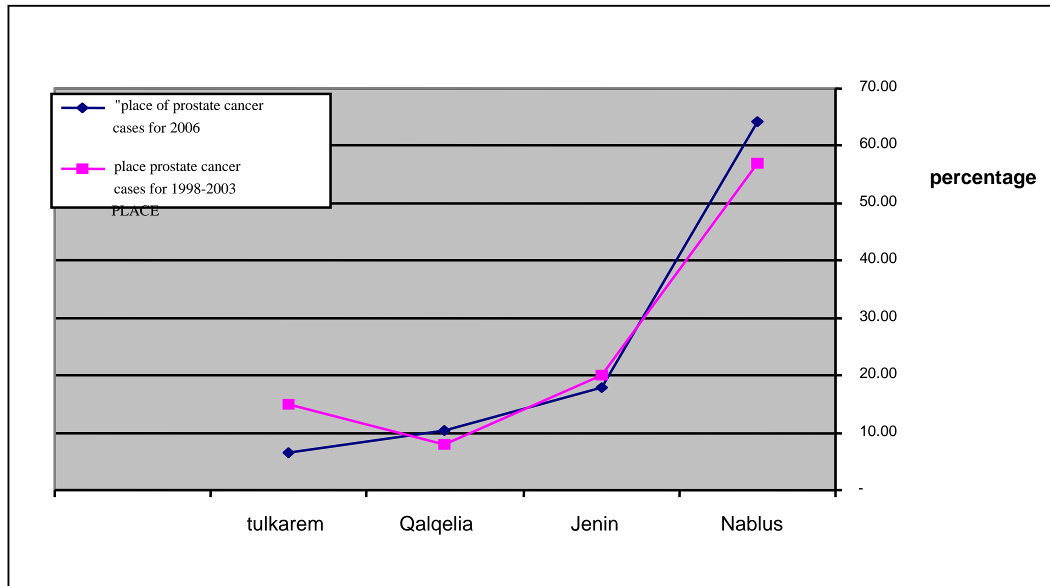


Figure 1: The figure above shows comparison in the distribution of prostate cancer in different cities in North West-Bank between the previous study (1992-2002) and our study (1998-2006).

From the Bar Chart above we notified that there is dramatically decrease on prostate cancer frequency in tulkarem during our study of 1998-2006, compared to the results frequency of the study of 1992-2002, from 15% to 6.4%. We also observed moderately increase in frequency in Qaliqelia in 1998-2006 (10.3%) vs. (7%) in 1992-2002, and slightly increase in frequency in Jenin in 1998-2006 (17.9%) vs. (16.6%) in 1992-2002. The surprising and sharply increase of Prostate cancer was observed in Nablus Tow, (65.4%) in 1998-2006 vs. (48.4%) in 1992-2002.

1. Smoking effect on Prostate Cancer: Comparison between 1992-2002 study and 1998-2006 study.

Table 4: The relationship between smoking and prostate cancer, 1998-2006.

The impact of smoking			
		Frequency	**Percent**
Valid	No	48	61.5
	Yes	29	37.2
	Total	77	98.7
Missing	System	1	1.3
Total		78	100.0

Table 5: The relationship between smoking and prostate cancer for 1992-2002.

prostate cancer cases among smokers, for 1992-2002			
		Frequency	**Percent**
Valid	No	50	54.8
	Yes	43	46.2
	Total	93	100

We detect from the tables above that the highest percent of prostate cancer are among nonsmokers; in 1992-2002 the percentage of prostate cancer among nonsmokers was 54.8%, comparing to 46.2% among

smokers, also we observed, that the percentage among nonsmokers and smokers in 1998-2006 was 61.5% vs. 37.2% respectively.

2. Infection episodes per year and prostate cancer:

Table 6: Relationship between a number of prostate infection episodes per year and prostate cancer.

Infection			
		Frequency	**Percent**
Valid	1.00	4	5.1
	2.00	18	23.1
	3.00	15	19.2
	Total	37	47.4
Missing	System	41	52.6
Total		78	100.0

We sight from the Table 6, that the highest percent of cancer were observed after a period of two year history of prostate infection (23.1%), followed by three year infection period (19.2%) and finally after only one infection (5.1%).

3. Frequency of Prostate cancer according year of onset:

Table 7: Date of onset of prostate cancer: Between the years 1998-2006.

Date of onset of prostate cancer			
		Frequency	**Percent**
Valid	1998	4	5.1
	1999 (***)	11	14.1
	2000 (*)	17	21.8
	2001	7	9.0
	2002	7	9.0
	2003 (**)	12	15.4
	2004	8	10.3
	2005	9	11.5
	1998-2006	1	1.3
	Total	76	97.4
Missing	System	2	2.6
Total		78	100.0

We observed from Table 7, above that the highest rate of prostate cancer is happened during the 2000, with 21.8%, followed by the year 2002 with rate of 15.4%, and finally at 1999 with frequency of 14.1%.

Comparing these rates with the frequencies of prostate cancer cases for 1992-2002 among smokers (table-8), below we notify that during 1999, was discovered the highest percent of cancers among smokers (17.49%), followed by 17.2% during the year 2000.

Table 8: Prostate cancer cases for 1992-2002: According to date of onset.

Prostate cancer cases for 1992-2002: Date of onset			
		Frequency	**Percent**
Valid	1998	56	16.33
	1999	60	17.49
	2000	59	17.20
	2001	55	16.03
	2002	58	16.92
	2003	55	16.3
	Total	343	100

4. Distribution of prostate cancer according to Cancer stages and grades.

Table 9: Prostate cancer stages.

Stages			
		Frequency	**Percent**
Valid	confined toprostate gland	1	1.3
	through prostate capsule	32	41.0
	Total	33	42.3
Missing	System	45	57.7
Total		78	100.0

We verify from Table 9, above that the highest percent of prostate cancer was capsulated (41.0%) and confined to prostate gland with a percent 1.3%.

Table 10: Cancer distribution by grade – 1998-2006.

Cancer Grades			
		Frequency	**Percent**
Valid	grade2	7	9.0
	grade 3	9	11.5
	grade 4	14	17.9
	grade 5	3	3.8
	Total	33	42.3
Missing	System	45	57.7
Total		78	100.0

Table 11: Cancer grade distribution – 1992-2002.

Prostate cancer distribution by grades, 1992-2002			
		Frequency	**Percent**
Valid	grade2	70	60.8
	grade 3	42	36.5
	grade 4	3	2.6
	Total	115	100

Table 10 and Table 11, In Table-10 we see that the highest frequency of cancer was observed at grade-4 (17.9%) and followed by grade-3 (11.5%), the frequency of grade - 2 was (9%), and finally at last grade; grade -5 was (3.8%). Comparing these grade percentages with the percentages of prostate cancer for 1998-2002 shown in Table-11, below we notice that the highest percent of cases of grade is grade 2 with percent 60.8% followed by grade 3 with percent 36.5% and grade 4 with a percentage of 2.6%.

5. Distribution of Prostate cancer by occupation among different groups.

Table 12: The frequency of Prostate cancer among different groups.

Occupation			
		Frequency	**Percent**
Valid	Teachers	10	12.8
	Workers	33	42.3
	Employees	13	16.7
	Farmers	14	17.9
	Doctors	4	5.1
	Directors	4	5.1
	Total	78	100.0

We notice from Table 12, above that the highest percent of cases are observed among simple worker with percent of 42.3%, and the lowest frequency was observed among doctors and directors with percentage of 5.1%.

6. Spreading of prostate cancer and its relationship to the number of children.

Table 13: Number of children and prostate cancer.

Number of children			
		Frequency	**Percent**
Valid	from 1-3	4	**5.1**
	from 4-6	27	34.6
	7 and more	44	**56.4**
	Total	75	96.2
Missing	System	3	3.8
Total		78	100.0

We realize from the data presented in Table 13 that the highest percent of prostate cancer (56.4%) is observed among fathers of families with number of children of seven and over. Families with number of children lower than three have the lowest percentage (5.1%).

7. Distribution of prostate cancer according to Age.

Table 14: Relationship between age and prostate cancer.

Age			
		Frequency	**Percent**
Valid	40-59	12	**15.4**
	60-70	21	26.9
	more than 70	45	**57.7**
	Total	78	100.0

From our data listed in Table 15, we notice that the highest percent rate was among men with 70 years and older (57.7%) and the lowest percentage rate was among 40-59 aged men with percent rate of (15.4%).

8. Distribution of Prostate cancer and its influence by the level of Prostate-Specific Antigen (PSA).

Table 15: Prostate cancer and PSA.

PSA categorized			
		Frequency	**Percent**
Valid	0 to 2.5 ng/ml- low	5	6.4
	10-19.9 ng/ml moderately	2	**2.6**
	20 ng/ml or more -significantly el	50	**64.1**
	Total	57	73.1
Missing	System	21	26.9
Total		78	100.0

Table 15, Describes the different level of PSA into the blood of patients, according to these results we observed that the highest frequency of prostate cancer was note in males with 20ng/ml or over and the frequency was (64.1%), the lowest percentage of prostate cancer (2.6%) was observed among men who has a moderately high PSA level (10 – 19.9ng/ml), but we observed that the lowest level of PSA (0-2.5ng/ml), has a prostate cancer of 6.4%.

CHAPTER FOUR

Discussion the Hypothesis

4. 1 First hypothesis

"There exists no significant relationship, in the significant level 0.05, between the grade of CA prostate and smoking".

To validate the truth of the hypothesis, we applied Pearson Chi-Square test between the variable of questions and the table below shows the frequencies of the variables.

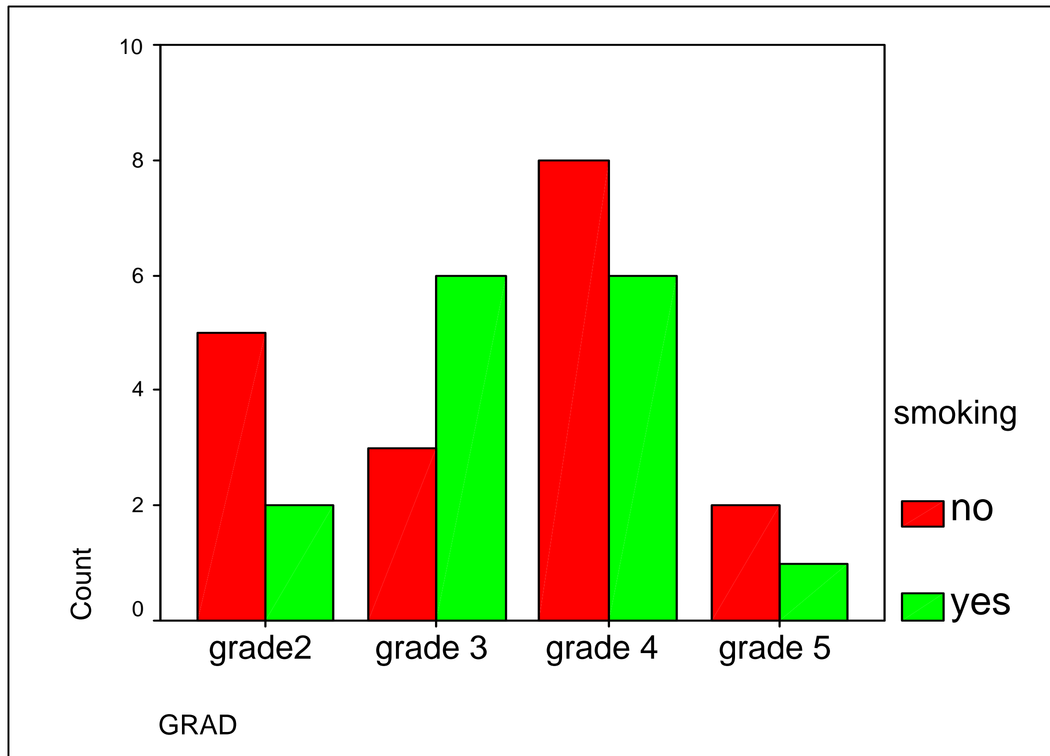
Table 16: The grade of CA prostate and smoking

			smoking		Total
			no	**yes**	
GRAD	**grade2**	Count	5	2	7
		within GRAD %	71.4%	28.6%	100.0%
	grade 3	Count	3	6	9
		within GRAD %	33.3%	66.7%	100.0%
	grade 4	Count	8	6	14
		within GRAD %	57.1%	42.9%	100.0%
	grade 5	Count	2	1	3
		within GRAD %	66.7%	33.3%	100.0%
Total		Count	18	15	33
		within GRAD%	54.5%	45.5%	100.0%

Table 17: Chi-Square Tests of the grade of prostate cancer and smoking

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	2.654 (a)	3	.448
Likelihood Ratio	2.701	3	.440
Linear-by-Linear Association	.001	1	.973
Number of valid cases	33		

Since the significance level i. e. 0.448, is bigger than that given in the hypothesis i. e., 0.05; we accept the hypothesis and say that: "There is no significant relationship, in the significant level 0.05, between the grade of CA prostate and smoking".



Bar chart 1: The bar chart above shows the frequencies between the grade of CA prostate and smoking.

4. 2. Second hypothesis

"There exists no significant relationship, in the significant level 0.05, between the grade of CA prostate and infection".

To validate the truth of the hypothesis, we applied Pearson Chi-Square test between the variable of questions and the table below shows the frequencies of the variables.

Table 18: The grade of CA prostate and infection

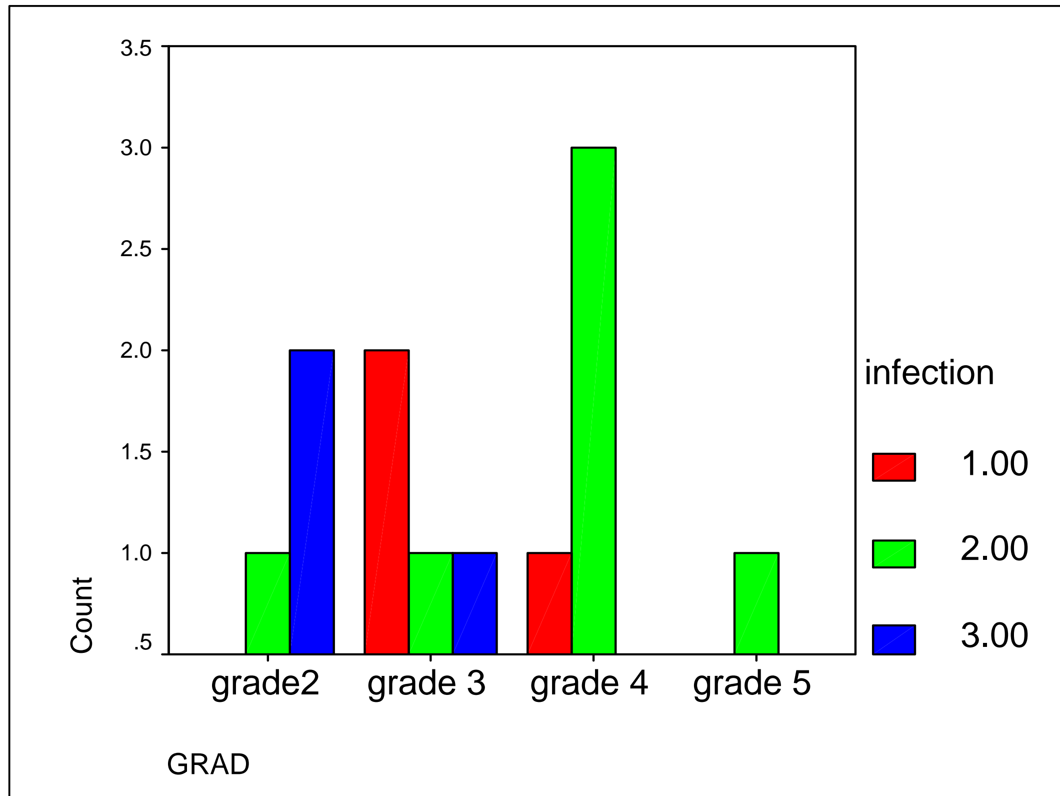
			Infection			Total
			1.00	2.00	3.00	
GRAD	grade2	Count		1	2	3
		% within GRAD		33.3%	66.7%	100.0%
	grade 3	Count	2	1	1	4
		% within GRAD	50.0%	25.0%	25.0%	100.0%
	grade 4	Count	1	3		4
		% within GRAD	25.0%	75.0%		100.0%
	grade 5	Count		1		1
		% within GRAD		100.0%		100.0%
Total		Count	3	6	3	12
		% within GRAD	25.0%	50.0%	25.0%	100.0%

Table 19: Chi-Square Tests of the grade of CA prostate and infection

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	7.000 (a)	6	.321
Likelihood Ratio	8.318	6	.216
Linear-by-Linear Association	1.610	1	.205
Number of valid cases	12		

Table 19, Since the significance level i. e. 0.321, is bigger than that given in the hypothesis i. e., 0.05; we accept the hypothesis and say that: "There is no significant relationship, in the significant level 0.05, between the grade of CA prostate and infection".

We observed the highest frequency of the prostate cancer in relation to infection.



Bar chart 2: The bar chart above we observed and demonstrate the relationship between the Grade of carcinoma and infection. At Grade-4.

4. 3. Third hypothesis:

"There exists no significant relationship, in the significant level 0.05, between the grade of CA prostate and occupation".

To validate the truth of the hypothesis, we applied Pearson Chi-Square test between the variable of questions and the table below shows the frequencies of the variables.

Table 20: The grade of CA prostate and occupations.

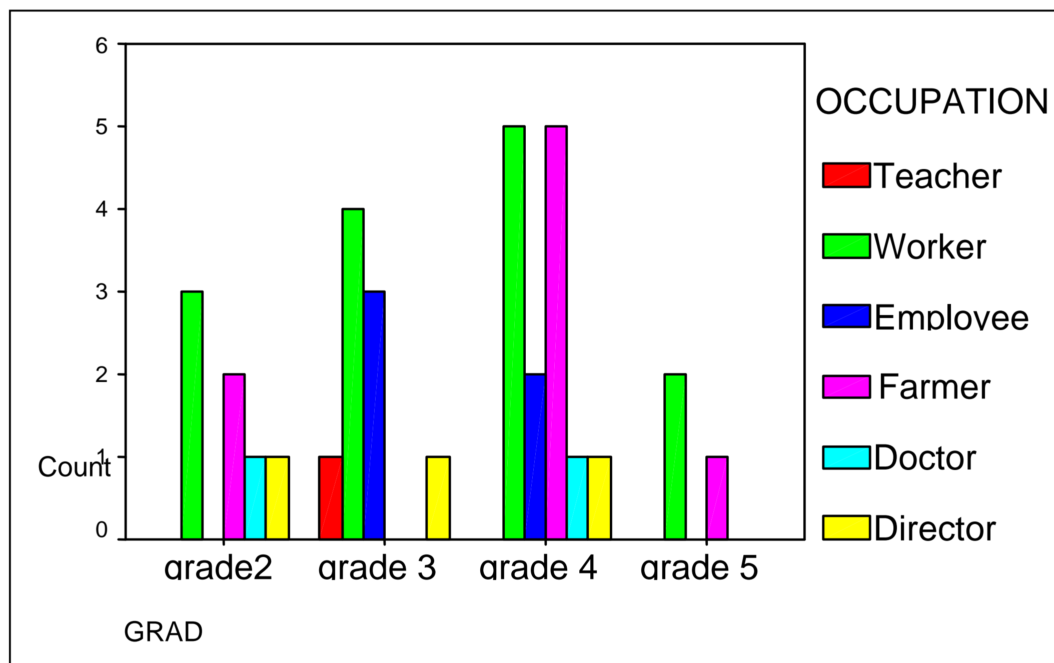
Grad		OCCUPATION						Total
		Teacher	Worker	Employee	Farmer	Doctor	Director	
Grade 2	Count		3		2	1	1	7
	% within GRAD		42.9%		28.6%	14.3%	14.3%	100.0%
grade 3	Count	1	4	3			1	9
	% within GRAD	11.1%	44.4%	33.3%			11.1%	100.0%
grade 4	Count		5	2	5	1	1	14
	% within GRAD		35.7%	14.3%	35.7%	7.1%	7.1%	100.0%
grade 5	Count		2		1			3
	% within GRAD		66.7%		33.3%			100.0%
Total	Count	1	14	5	8	2	3	33
	% within GRAD	3.0%	42.4%	15.2%	24.2%	6.1%	9.1%	100.0%

Table 21: Chi-Square Tests of the grade of CA prostate and occupation.

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	11.939 (a)	15	.684
Likelihood Ratio	15.648	15	.406
Linear-by-Linear Association	.168	1	.682
Number of valid cases	33		

Table 21, since the significance level i. e. 0.684, is bigger than that given in the hypothesis i. e., 0.05; we accept the hypothesis and say that: "There is no significant relationship, in the significant level 0.05, between the grade of CA prostate and occupation".

We observed that the frequency of prostate cancer is extremely increased among simple workers, on small industries and small business Jobs comparing to high educated persons like Doctors and Directors.



Bar chart 3: The bar chart above show the frequencies of the between the grade of CA prostate and occupation.

4. 4. Fourth hypothesis:

"There exists no significant relationship, in the significant level 0.05, between the grade of CA prostate and N° of children".

To validate the truth of the hypothesis, we applied Pearson Chi-Square test between the variable of questions and the table below shows the frequencies of the variables.

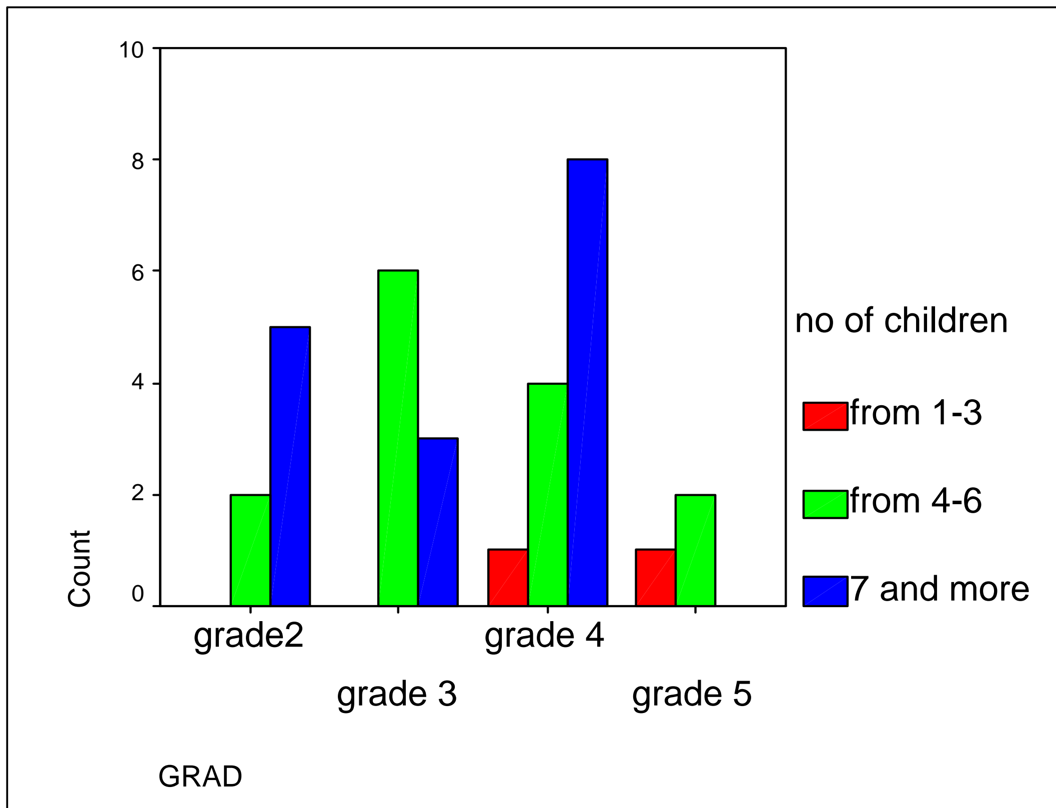
Table 22: The grade of CA prostate and N° of children.

			N° of children			Total
			from 1-3	from 4-6	7 and more	
GRAD	grade2	Count		2	5	7
		% within GRAD		28.6%	71.4%	100.0%
	grade 3	Count		6	3	9
		% within GRAD		66.7%	33.3%	100.0%
	grade 4	Count	1	4	8	13
		% within GRAD	7.7%	30.8%	61.5%	100.0%
	grade 5	Count	1	2		3
		% within GRAD	33.3%	66.7%		100.0%
Total		Count	2	14	16	32
		% within GRAD	6.3%	43.8%	50.0%	100.0%

Table 23: Chi-Square Tests of the grade of CA prostate and N° of children.

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	9.863 (a)	6	.131
Likelihood Ratio	10.439	6	.107
Linear-by-Linear Association	2.616	1	.106
Number of valid cases	32		

Since the significance level i. e. 0.131, is bigger than that given in the hypothesis i. e., 0.05; we accept the hypothesis and say that: "There is no significant relationship, in the significant level 0.05, between the grade of CA prostate and number of children".



Bar chart 4: The bar chart above show the frequencies of the between the grade of CA prostate and number of children.

4. 5. Fifth hypothesis:

"There exists no significant relationship, in the significant level 0.05, between the grade of CA prostate and age".

To validate the truth of the hypothesis, we applied Pearson Chi-Square test between the variable of questions and the table below shows the frequencies of the variables.

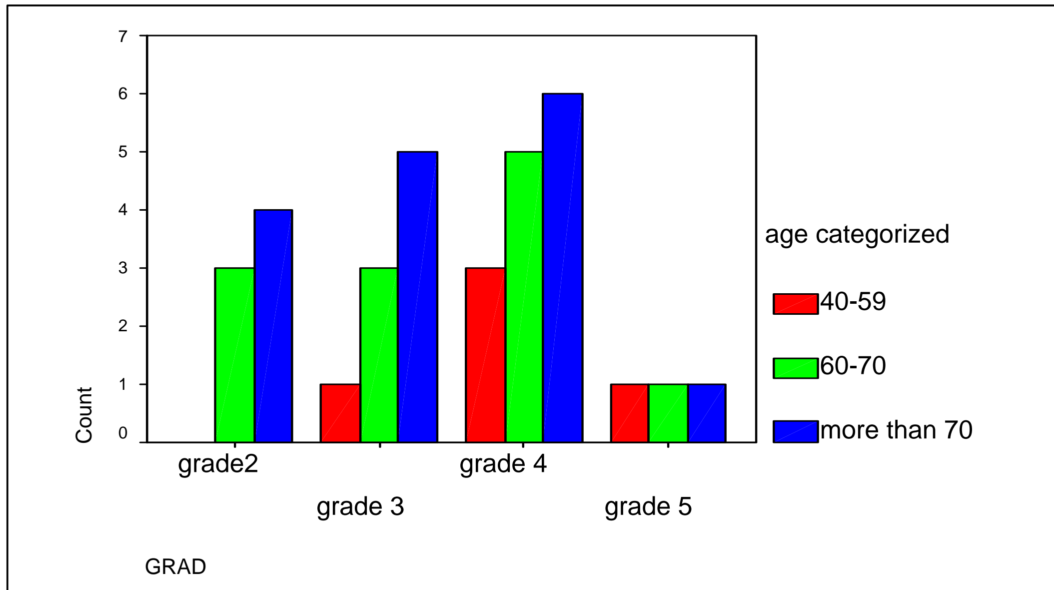
Table 23: The grade of CA prostate and age.

			Age categorized			Total
			40-59	60-70	Over 70/yr	
GRAD	grade2	Count		3	4	7
		% within GRAD		42.9%	57.1%	100.0%
	grade 3	Count	1	3	5	9
		% within GRAD	11.1%	33.3%	55.6%	100.0%
	grade 4	Count	3	5	6	14
		% within GRAD	21.4%	35.7%	42.9%	100.0%
	grade 5	Count	1	1	1	3
		% within GRAD	33.3%	33.3%	33.3%	100.0%
Total		Count	5	12	16	33
		% within GRAD	15.2%	36.4%	48.5%	100.0%

Table 24: Chi-Square Tests of the grade of CA prostate and age.

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	2.724 (a)	6	.843
Likelihood Ratio	3.592	6	.732
Linear-by-Linear Association	1.884	1	.170
Number of valid cases	33		

Since the significance level i. e. 0.843, is bigger than that given in the hypothesis i. e., 0.05; we accept the hypothesis and say that: "There is no significant relationship, in the significant level 0.05, between the grade of CA prostate and age".



Bar chart 5: The bar chart above show the frequencies of the between the grade of CA prostate and smoking.

4 . 6. Sixth hypothesis

"There exists no significant relationship, in the significant level 0.05, between the stage of CA prostate and smoking".

To validate the truth of the hypothesis, we applied Pearson Chi-Square test between the variable of questions and the table below shows the frequencies of the variables.

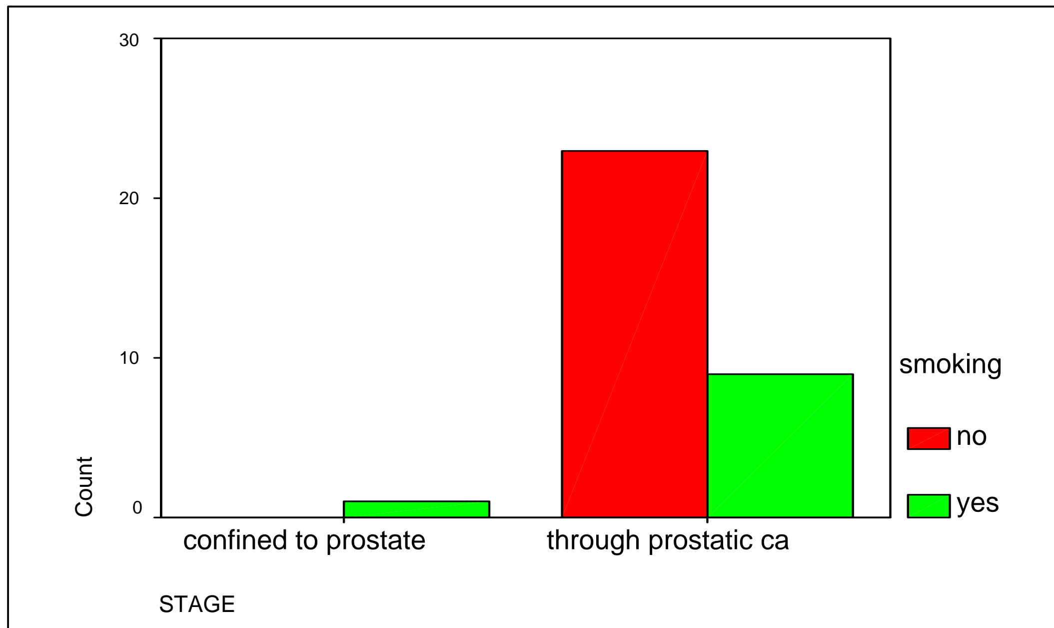
Table 25: The stage of CA prostate and smoking.

			smoking		Total
			no	yes	
STAGE	Confined to prostate gland	Count		1	1
		% within STAGE		100.0%	100.0%
	Through prostate capsule	Count	23	9	32
		% within STAGE	71.9%	28.1%	100.0%
Total		Count	23	10	33
		% within STAGE	69.7%	30.3%	100.0%

Table 26: Chi-Square Tests of the stage of CA prostate and smoking**.**

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	2.372 (b)	1	.124
Continuity Correction(a)	.189	1	.663
Likelihood Ratio	2.461	1	.117
Fisher's Exact Test			
Linear-by-Linear Association	2.300	1	.129
Number of valid cases	33		

Table 26: Since the significance level i. e. 0.124, is bigger than that given in the hypothesis i. e., 0.05; we accept the hypothesis and say that: "There is no significant relationship, in the significant level 0.05, between the stage of CA prostate and smoking".



Bar chart 6: The bar chart above show the frequencies of the between the stage of CA prostate and smoking..

"There exists no significant relationship, in the significant level 0.05, between the stage of CA prostate and occupation".

To validate the truth of the hypothesis, we applied Pearson Chi-Square test between the variable of questions and the table below show the frequencies of the variables.

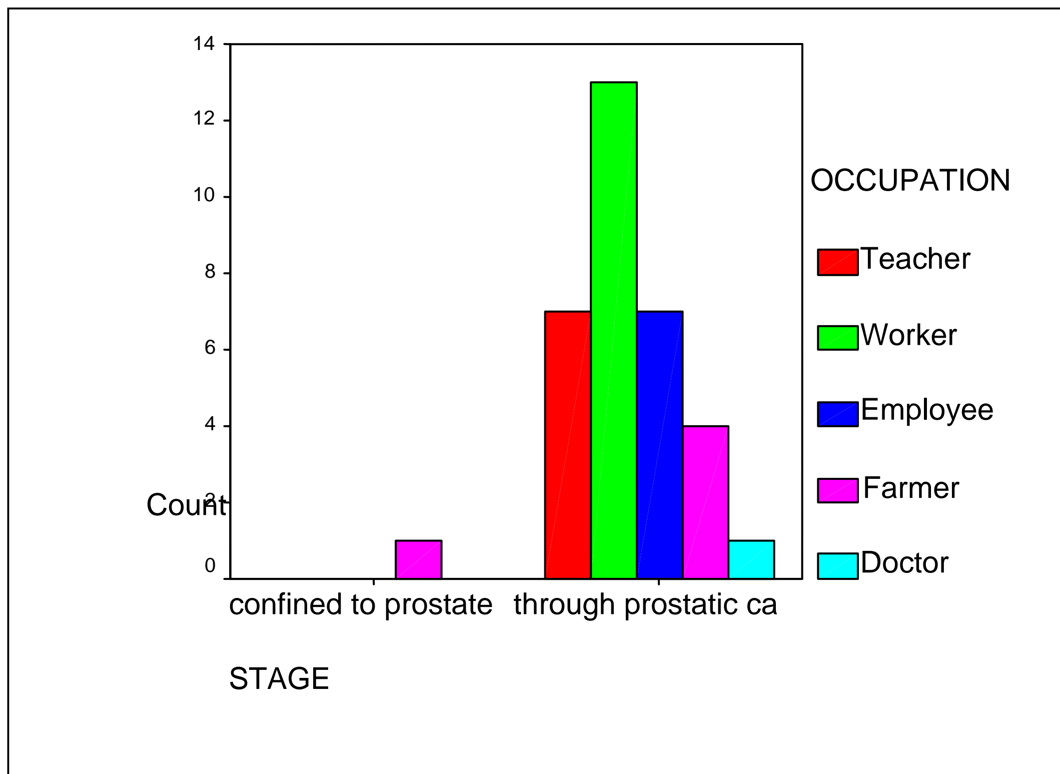
Table 27: The stage of CA prostate and occupations.

			OCCUPATION					**Total**
			teacher	**worker**	**employee**	**farmer**	**doctor**	
STAGE	**confined to prostate gland**	**Count**				1		1
		% within STAGE				100.0%		100.0%
	through prostate capsule	**Count**	7	13	7	4	1	32
		% within STAGE	21.9%	40.6%	21.9%	12.5%	3.1%	100.0%
Total		**Count**	7	13	7	5	1	33
		% within STAGE	21.2%	39.4%	21.2%	15.2%	3.0%	100.0%

Table 28: Chi-Square Tests of the stage of CA prostate and occupation

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	5.775 (a)	4	.217
Likelihood Ratio	3.958	4	.412
Linear-by-Linear Association	2.247	1	.134
Number of valid cases	33		

Table 28: Since the significance level i. e. 0.217, is bigger than that given in the hypothesis i. e., 0.05; we accept the hypothesis and say that: "There is no significant relationship, in the significant level 0.05, between the stage of CA prostate and occupation".



Bar chart 7: The bar chart above show the frequencies of the between the stage of CA prostate and occupation.

4. 8. Eighth hypothesis

"There exists no significant relationship, in the significant level 0.05, between the stage of CA prostate and N° of children".

To validate the truth of the hypothesis, we applied Pearson Chi-Square test between the variable of questions and the table below shows the frequencies of the variables.

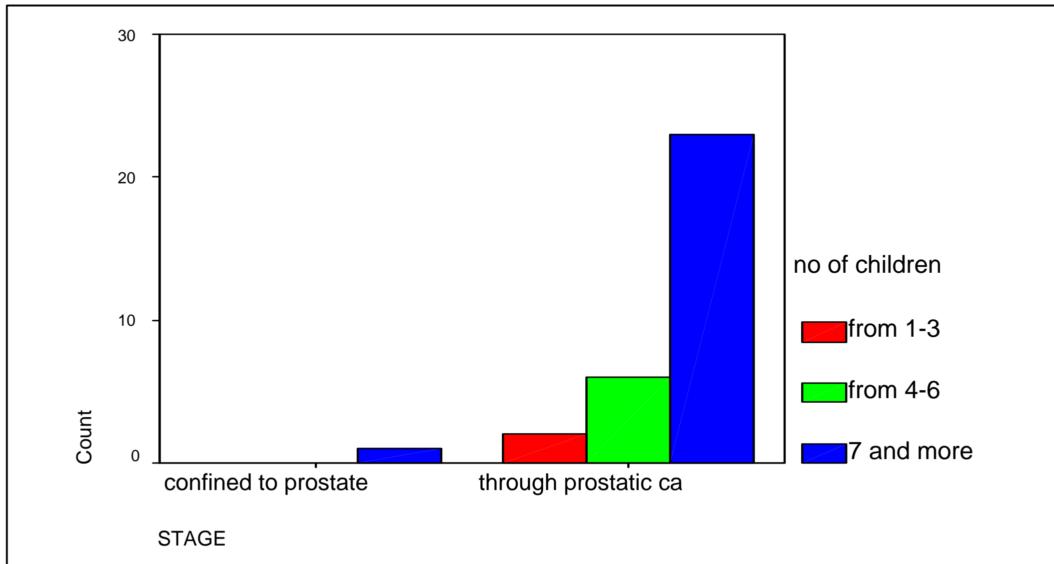
Table 29: The stage of CA prostate and N° of children

			N° of children			**Total**
			1-3	**4-6**	**≥ 7**	
STAGE	**confined to prostate gland**	Count			1	1
		%within STAGE			100.0%	100.0%
	through prostatic capsule	Count	2	6	23	31
		%within STAGE	6.5%	19.4%	74.2%	100.0%
Total		Count	2	6	24	32
		%within STAGE	6.3%	18.8%	75.0%	100.0%

Table 30: Chi-Square Tests of the stage of CA prostate and no of children.

	Value	**df**	**Asymp. Sig. (2-sided)**
Pearson Chi-Square	.344 (a)	2	.842
Likelihood Ratio	.586	2	.746
Linear-by-Linear Association	.287	1	.592
Number of valid cases	32		

Table 30, since the significance level i. e. 0.842, is bigger than that given in the hypothesis i. e., 0.05; we accept the hypothesis and say that: "There is no significant relationship, in the significant level 0.05, between the stage of CA prostate and number of children".



Bar chart 8: The bar chart above show the frequencies of the between the stage of CA prostate and number of children.

4.9. Ninth hypothesis

"There exists no significant relationship, in the significant level 0.05, between the stage of CA prostate and age".

To validate the truth of the hypothesis, we applied Pearson Chi-Square test between the variable of questions and the table below show the frequencies of the variables.

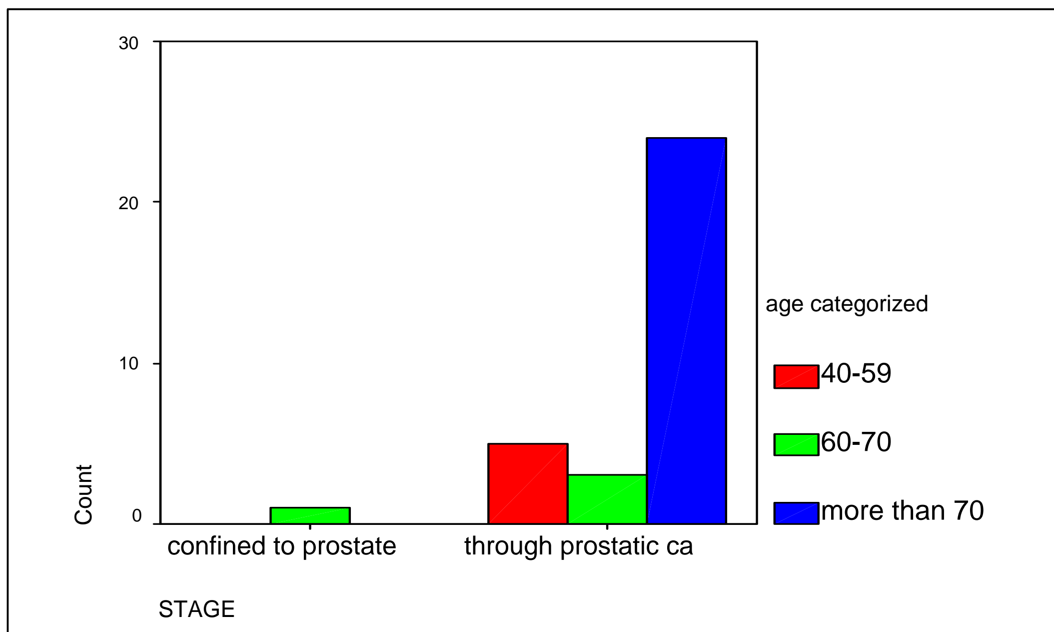
Table 31: The stage of CA prostate and age

			age categorized			**Total**
			40-59	**60-70**	**more than 70**	
STAGE	**confined to prostate gland**	Count		1		1
		% within STAGE		100.0 %		100.0%
	through prostatic capsule	Count	5	3	24	32
		% within STAGE	15.6%	9.4%	75.0%	100.0%
Total		Count	5	4	24	33
		% within STAGE	15.2%	12.1%	72.7%	100.0%

Table 32: Chi-Square Tests of the stage of CA prostate and age**.**

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	7.477 (a)	2	.024
Likelihood Ratio	4.464	2	.107
Linear-by-Linear Association	.606	1	.436
Number of valid cases	33		

Table 32. Since the significance level i. e. 0.024, is smaller than that given in the hypothesis i. e., 0.05; we reject the hypothesis and say that: "There is a significant relationship, in the significant level 0.05, between the grade of CA prostate and age".



Bar chart 9: The bar chart above show the frequencies of the between the stage of CA prostate and age.

4. 10 Tenth hypothesis

"There exists no significant relationship, in the significant level 0.05, between the PSA categorized and smoking".

To validate the truth of the hypothesis, we applied Pearson Chi-Square test between the variable of questions and the table below show the frequencies of the variables.

Table 33: The PSA categorized and smoking

			smoking		Total
			no	**yes**	
PSA categorized	**0 to 2.5 ng/ml-low**	**Count**	5		5
		% within PSA categorized	100.0%		100.0 %
	10-19.9 ng/ml moderately	Count	1	1	2
		% within psa categorized	50.0%	50.0%	100.0 %
	20 ng/ml or more - significantly el	Count	28	21	49
		% within psa categorized	57.1%	42.9%	100.0 %
Total		Count	34	22	56
		% within psa categorized	60.7%	39.3%	

Table 34: Chi-Square Tests of the PSA categorized and smoking.

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	3.594 (a)	2	.166
Likelihood Ratio	5.343	2	.069
Linear-by-Linear Association	3.174	1	.075
Number of valid cases	56		

Since the significance level i. e. 0.166, is bigger than that given in the hypothesis i. e., 0.05; we accept the hypothesis and say that: "There is no significant relationship, in the significant level 0.05, between PSA categorized and smoking".

4. 11 Eleventh hypothesis:

"There exists no significant relationship, in the significant level 0.05, between the PSA categorized and stage".

To validate the truth of the hypothesis, we applied Pearson correlation test between the variables and the table below show the result of the test**.**

Table 35. Pearson Correlation between PSA categorized and stage.

		PSA	**STAGE**
PSA	Pearson Correlation	1	.164
	Sig. (2-tailed)	.	.443
	N	57	24
STAGE	Pearson Correlation	.164	1
	Sig. (2-tailed)	.443	.
	N	24	

Table 35. Since the significance level i. e. 0.443, is bigger than that given in the hypothesis i. e., 0.05; we accept the hypothesis and say that: “There is no significant relationship, in the significant level 0.05, between the PSA categorized and stage".

4. 12 Twelfth hypothesis

"There exists no significant relationship, in the significant level 0.05, between the PSA categorized and grade".

To validate the truth of the hypothesis, we applied Pearson correlation test between the variables and the table below show the result of the test.

Table 36: Pearson Correlation between PSA categorized and grade.

		PSA	GRAD
PSA	Pearson Correlation	1	.262
	Sig. (2-tailed)	.	.217
	Number	57	24
GRAD	Pearson Correlation	.262	1
	Sig. (2-tailed)	.217	.
	Number	24	33

Table 36 Since the significance level i. e. 0.217, is bigger than that given in the hypothesis i. e., 0.05; we accept the hypothesis and say that: “There is no significant relationship, in the significant level 0.05, between the PSA categorized and grade"

4.13 Thirteen Hypothesis

"There exists no significant relationship, in the significant level 0.05, between the infection and age".

To validate the truth of the hypothesis, we applied Pearson correlation test between the variables and the table below show the result of the test.

Table 37: Pearson Correlation between infection and age.

		AGE	Infection
PSA	Pearson Correlation	1	.354 (*)
	Sig. (2-tailed)	.	.032
	N	78	37
Infection	Pearson Correlation	.354 (*)	1
	Sig. (2-tailed)	.032	.
	N	37	37

Since the significance level is. 0.032, is smaller than that given in the hypothesis i. e., 0.05; we reject the hypothesis and say that: "There is a significant relationship, in the significant level 0.05, between infection and age".

4. 14. Fourteen hypothesis:

"There exists no significant relationship, in the significant level 0.05, between the PSA categorized and age".

To validate the truth of the hypothesis, we applied Pearson correlation test between the variables and the table below show the result of the test.

Table 38: Pearson Correlation between PSA categorized and age

		AGE	**PSA**
AGE	Pearson Correlation	1	-.310(*)
	Sig. (2-tailed)	.	.019
	N	78	57
PSA	Pearson Correlation	-.310 (*)	1
	Sig. (2-tailed)	.019	.
	N	57	57

Table 38. Since the significance level i. e. 0.019, is smaller than that given in the hypothesis i. e., 0.05; we reject the hypothesis and say that: "There is a significant relationship, in the significant level 0.05, between the PSA categorized and age".

4. 15 fifteen hypotheses:

"There exists no significant relationship, in the significant level 0.05, between the PSA categorized and occupation".

To validate the truth of the hypothesis, we applied Pearson correlation test between the variables and the table below show the result of the test.

Table 39: Pearson Correlation between PSA categorized and occupation

		OCCUPATION	**PSA**
OCCUPATION	Pearson Correlation	1	-.383 (**)
	Sig. (2-tailed)	.	.003
	N	78	57
PSA	Pearson Correlation	-.383(**)	1
	Sig. (2-tailed)	.003	.
	N	57	57

Table 39. Since the significance level i. e. 0.003, is smaller than that given in the hypothesis i. e., 0.05; we reject the hypothesis and say that: "There is a significant relationship, in the significant level 0.05, between the PSA categorized and occupation".

4. 16 sixteen hypothesis:

"There exists no significant relationship, in the significant level 0.05, between the PSA categorized and N°. of children".

To validate the truth of the hypothesis, we applied Pearson correlation test between the variables and the table below show the result of the test.

Table 40: Pearson Correlation between PSA categorized and N° of child.

		N°. child	**PSA categorized**
N°. child	Pearson Correlation	1	-.320 (*)
	Sig. (2-tailed)	.	.018
	N	75	54
PSA categorized	Pearson Correlation	-.320 (*)	1

	Sig. (2-tailed)	.018	.
	N	54	57

Table 40 Since the significance level i. e. 0.018, is smaller than that given in the hypothesis i. e., 0.05; we reject the hypothesis and say that: "There is a significant relationship, in the significant level 0.05, between the PSA categorized and N° of children".

4. 17. seventeen hypothesis:

In order to study the truth of the hypotheses "There is no statistically significant differences, in the significance level 0.05, between the stage and age". We use One Way ANOVA in the variable of the study from 40-59 (5), 60-70 (4), more than 70 (24 the table below show the result of the test.

Table 41: One Way ANOVA For age Variable.

	Sum of Squares	**df**	**Mean Square**	**F**	**Sig.**
Between Groups	.220	2	.110	4.394	.021
Within Groups	.750	30	.025		
Total	.970	32			

Since the level of significance (0.021) is smaller than 0.05, we reject the hypothesis and conclude that "There is a statistically significant differences, in the significance level 0.05, between the infection and age variable".

To found the different for home of variable we use the LSD test And the table below shows the result.

Table 42: Multiple Comparisons Dependent Variable: LSD.

(I) age categorized	**(J) age categorized**	**Mean Difference (I-J)**
40-59	60-70	.2500 (*)

	more than 70	.0000
60-70	40-59	-.2500 (*)
	more than 70	-.2500 (*)
more than 70	40-59	.0000
	60-70	.2500 (*)

From the table above we found there is a statistically significant differences, in the significance level 0.05, between the infection and age variable for benefit age from more than 70 years

Tables include statistically significant Results:

The Tables below show the person chi square df and significant values of independent variable and dependent variable of the study.

Table 43: The person chi square df and significant values of grad of prostate carcinoma and dependent variable.

Dependent variable	Pearson Chi-Square	Df	Asymp. Sig. (2-sided)
Smoking	2.654	3	0.448
infection	7.000	6	0.321
Occupation	11.939	25	0.684
N°. of children	9.863	6	0.131
age	2.724	6	0.843

From the table above we notice the level of significance 0.448, 0.321, 0.684 0.131and 0.843 of the dependant variable smoking,infection, occupation, no. of children and age respectively is bigger than 0.05, so we accept the hypothesis and conclude that "There exists no significant relationship, in the significant level 0.05, between grad of CA prostate and dependent variable smoking,infection,occupation,no. of children and age".

Table 44: The person chi square df and significant values of stage of Prostate Carcinoma and dependent variable

Dependent variable	Pearson Chi-Square	Df	Asymp. Sig. (2-sided)
Smoking	2.372	1	124
Occupation	5.775	4	0.217

N°. of children	0.344	2	0.842
age	7.447	2	0.024

From the table above we notice the level of significance 0.124, 0.217 and 0. 0.842of the dependant variable smoking,occupation and no. of children respectively is bigger than 0.05, so we accept the hypothesis and conclude that "There exists no significant relationship, in the significant level 0.05, between stage of CA prostate and dependent variable smoking, occupation and no. of children, "and the significant level of age 0.024 is smaller than 0.05, so we reject the hypothesis and conclude that" There exists a significant relationship, in the significant level 0.05, between stage of CA prostate and age"

Table 45: The person chi square df and significant values of PSA categorized and dependent variable.

Dependent variable	Pearson Chi-Square	Df	Asymp. Sig. (2-sided)
Stage	0.164	-	0.443
grade	0.262	--	0.217
smoking	3.594	2	0.166

From the table above we notice the level of significance 0.443, 0.217.166, of the dependant variable stage, grade, smoking,e respectively is bigger than 0.05, so we accept the hypothesis and conclude that "There exists no significant relationship, in the significant level 0.05, between PSA categorized and dependent variable stage, grade, smoking".

Table 46: The Pearson correlation and significant values of PSA categorized and dependent variable

Dependent variable	Pearson correlation	Asymp. Sig. (2-sided)
Occupation	21.858	0.016
N°. of children	- 0.320	0.018
Age	- 0.383	0.003

From the table above we notice the level of significance 0.016, 0.018 and 0.003, of the dependant variable occupation, no. Of children and age respectively is smaller than 0.05, so we reject the hypothesis and conclude that "There exists a significant relationship, in the significant level 0.05, between PSA categorized and dependent variable occupation, number of children and age".

Table 47: The person chi square df and significant values of age and dependent variable - Infection

Dependent variable	Pearson correlation	Asymp. Sig. (2-sided)
Infection	0.354	0.032

From the table above we notice the level of significance 0.032, of the dependant variable infection is smaller than 0.05, so we reject the hypothesis and conclude that "There exists a significant relationship, in the significant level of (0.05), between age and infection"

Table 48: the significant values of stage and dependent variable age

Dependent variable	Asymp. Sig. (2-sided)
Age	0.021

From the table above we notice the level of significance 0.021, of the dependant variable age is smaller than 0.05, so we reject the hypothesis and conclude that "There exists a significant differences, in the significant level 0.05, between stage and age".

Results Our Study (1998-2006):

Seventy eight Prostate Cancers Patients were reported in North West-Bank, Palestinian Authority. This result represents an incidence rate of 10.4 per 100.000 populations. We revealed that the majority of patients (64.1%) were diagnosed in Nablus city and the lowest (6.4%) in tulkarem city (Table -2 and figure -1). The highest percentage of prostate cancer was found among: [Non-smokers vs. smokers (61.5% vs 37.2% respectively, Table -4 and Table -5), Capsulated cancer vs. confined to prostate gland (41.% vs. 1.3%, respectively, Table -9, Bars -6 & 9), High frequency among industrial workers vs. Doctors (42.3% vs 5.1%, Table – 12, Bar chat -3 and -7), families of seven children or over vs. less than three (56.4% vs. 5.1%, Table -13), patients over 65 years (Table -14), with high PSA serum levels (20ng/ml or over), (64.1%), Table – 14 and Table -15, Bars – 10 & 11]. Person Chi Square df, significant values of PSA categorized and dependent variables (Occupation, N° of children and Age), showed a Pearson correlation and statistical significance at P-Value = *0.05* which was respectively *(0.016, 0.018, 0.003,* Tables – 44, 46, 47 and table - 47*).* *S*ignificant relationship was found between age and infection (*P-value = 0.032,* Table - 47) and between cancer stage and age (0.021, Tables -44, 48). We found no significant relationships between Grade of Prostate Cancer and different variables like (Age, smoking, occupation, infection and number of children). Statistically insignificant relationship was observed between Stage of Prostate Carcinoma and (Smoking, occupation, number of children and age).

Discussion & Summary

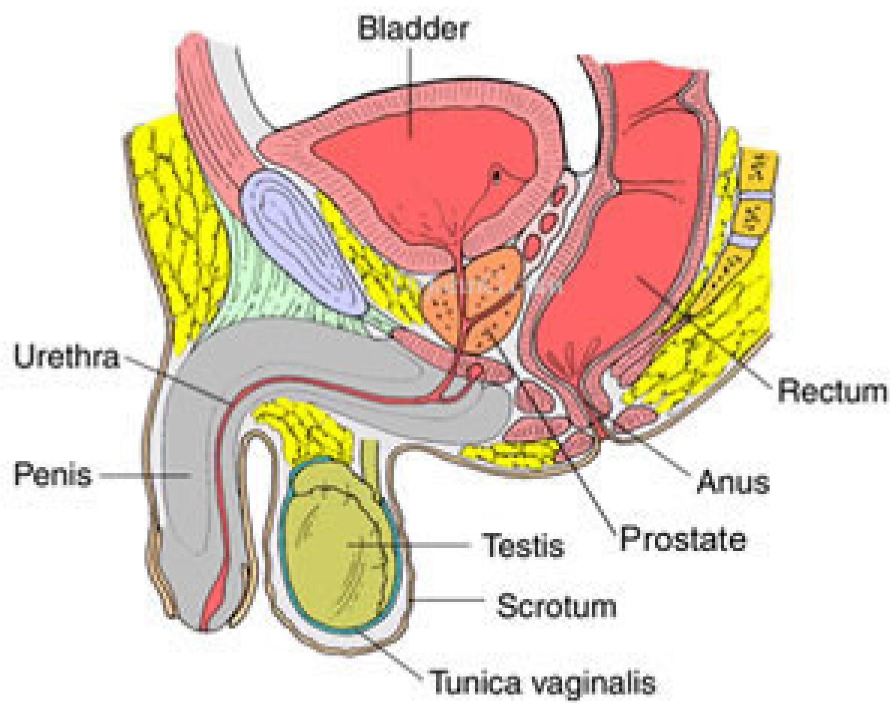
Prostate cancer is a very serious personal and public health problem disproportionately strikes individuals worldwide, affecting African Americans more frequently than Caucasians. In Palestine in the basis of 1992–2002 epidemiological study from An-Najah National Universitythe overall age-adjusted incidence of prostate cancer was 28.9 of 100,000 among West-Bank citizen. Comparing these results with data bases on our study (1998-2006), we observed a dramatically decreased in incidence rate by more than two fold (10.8 of 100,000) among North West-Bank citizens.

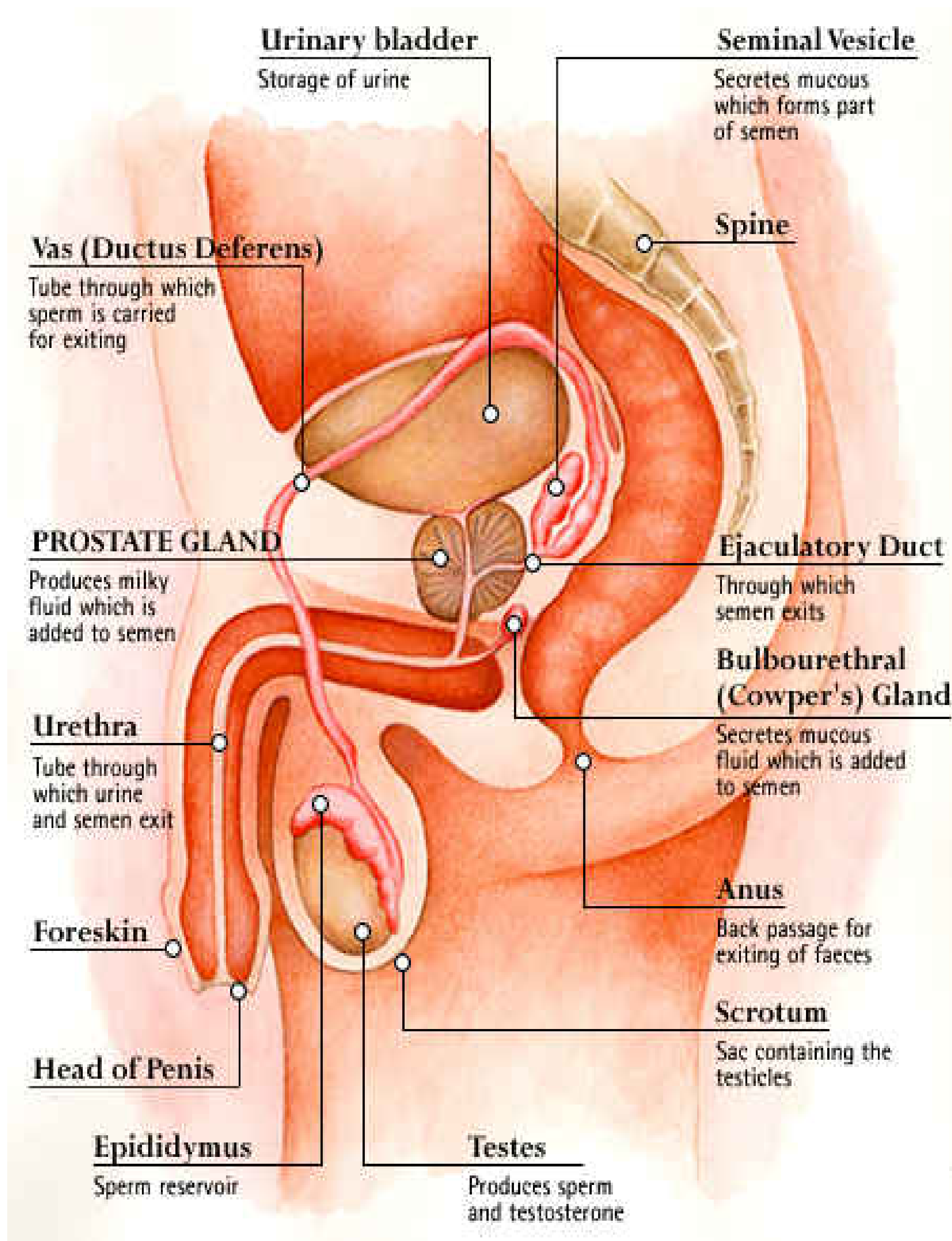
Indeed, when we compare our results of 1998-2006 with the previous study of 1992-2002, we were surprise to found a big difference and unequal distributions of Prostate cancer among the different cities in North West-Bank; Decreasing in several town and increasing in frequency rate in other ones; For example the rate frequency in tulkarem town was 15% during 1992-2002, and this frequency decreases considerably to be 6.4%, opposite finding were observed in Nablus, Jenin and Qalqelia cities; the rate frequencies were (48.4%, 16.6% and 7%, respectively during 1992-2002 study, and increased dramatically in Nablus town to the rate of 65.4% during our 1998-2006 study and moderately increase in Jenin and Qalqelia cities (17.9% and 10.3% respectively).

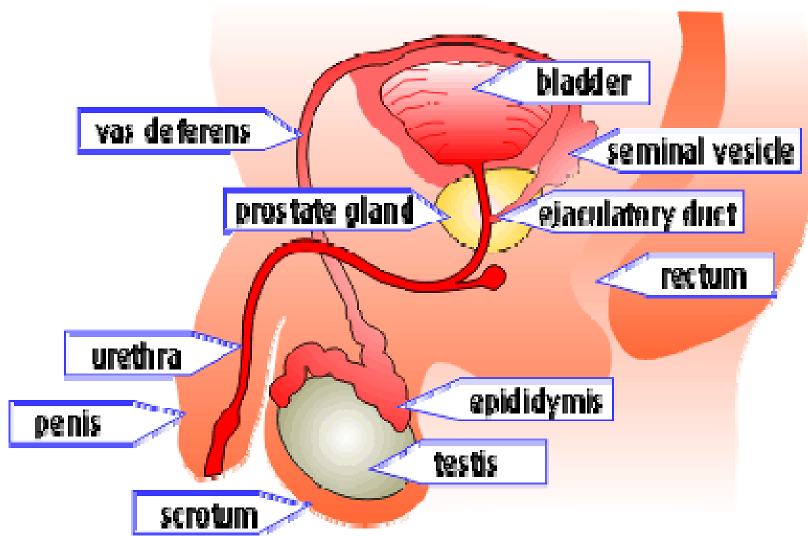
As we know, established risk factors for prostate cancer include age, ethnicity, family history of prostate cancer, and high-fat or meat dietOther factors suspected include hormone metabolism, vitamin D metabolism, and a few occupational exposures. In addition, other candidates' risk factors

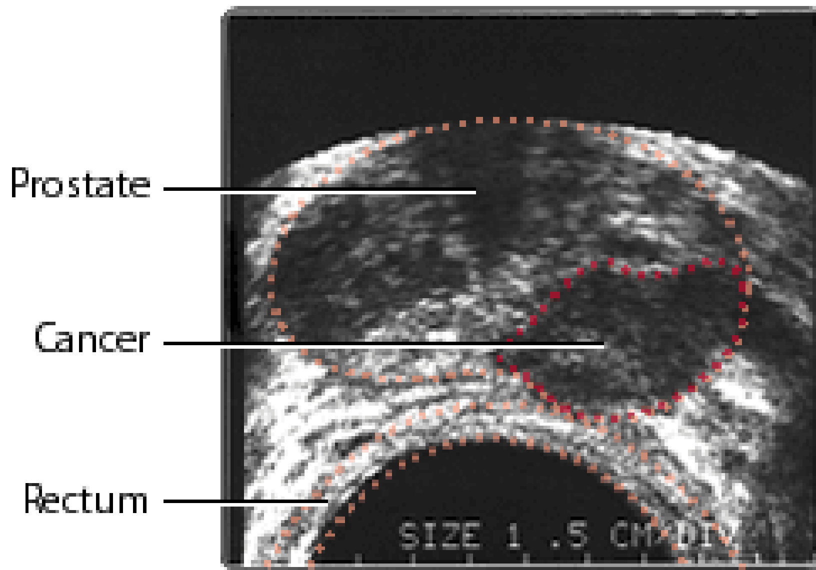
were examined in our study of 1998-2006, like smoking and number of children and their impact on the Prostate cancer distribution. In conclusion; the important finding observed in our study are: Prostate cancer is more frequent in Nablus city than in other towns in North West-Bank and highest percentage of prostate cancer was found among non-smokers (61.5%) comparing to Smokers (37.2%), also we revealed that occupation style; like simple industrials employers, with a low socioeconomic status are more impose to prostate cancer than high socioeconomic status ones like Doctors and Directors (42.3% vs 5.1% respectively), this means that exposure to chemicals and toxic materials are a risk factor for prostate cancer. We also notify, those fathers of families of seven children or over are more likely to be affected than fathers' families with less than three kids (56.4% vs. 5.1%), this may a result of hormonal disturbances and deficits. We also put in the picture that the cutoff PSA level of 20ng/ml or over, observed among 64.1%, of our Prostate cancer cases.

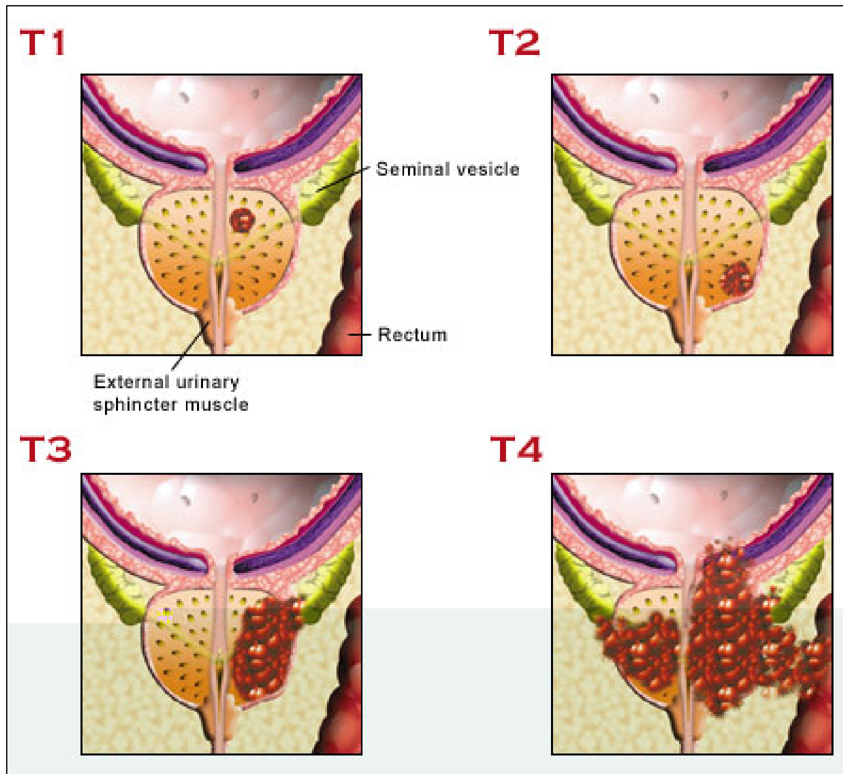
Figures of prostate

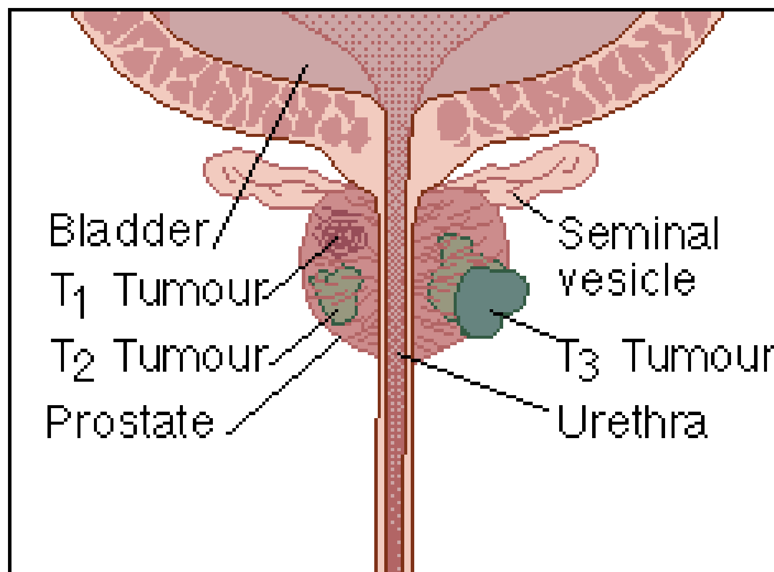


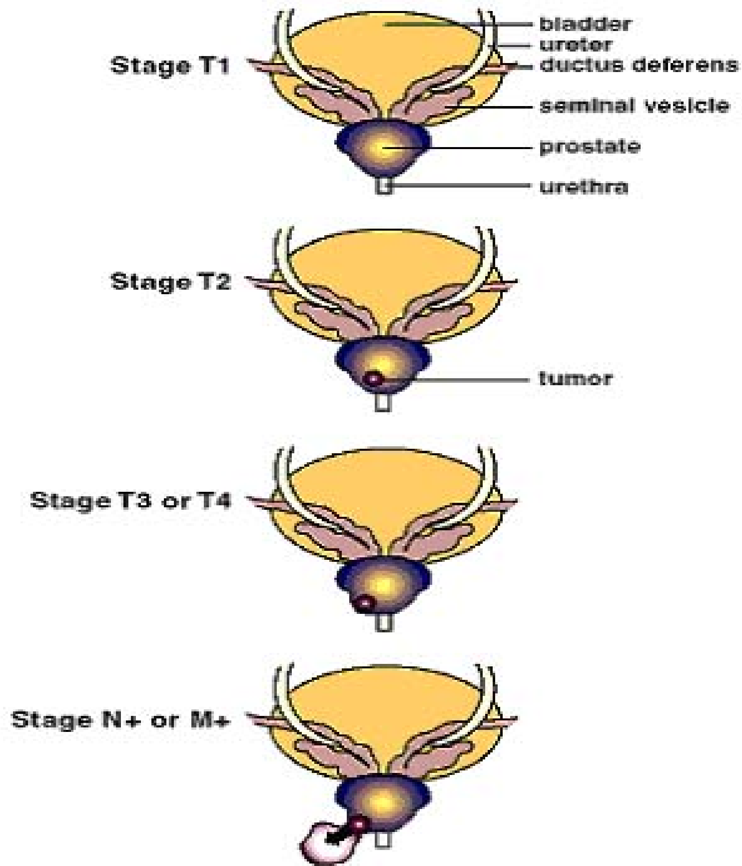

Urinary bladder
Storage of urine
Seminal Vesicle
Secretes mucous which forms part of semen
Spine
Vas (Ductus Deferens)
Tube through which sperm is carried for exiting
PROSTATE GLAND
Produces milky fluid which is added to semen
Ejaculatory Duct
Through which semen exits
Bulbourethral (Cowper's) Gland
Secretes mucous fluid which is added to semen
Urethra
Tube through which urine and semen exit
Anus
Back passage for exiting of faeces
Foreskin
Scrotum
Sac containing the testicles
Head of Penis
Epididymus
Sperm reservoir
Testes
Produces sperm and testosterone

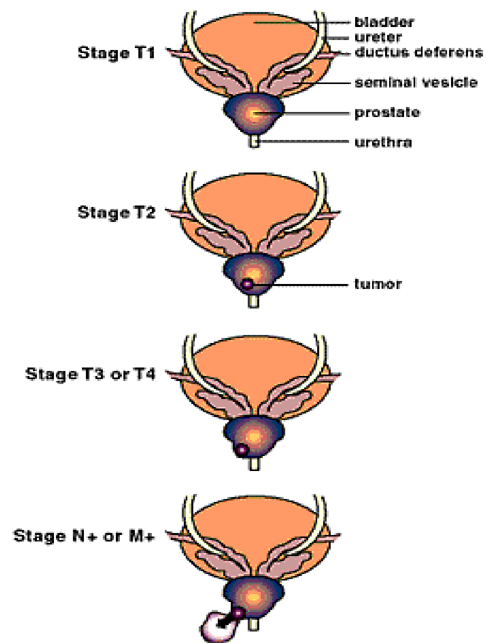

bladder
vas deferens
seminal vesicle
prostate gland
ejaculatory duct
rectum
urethra
epididymis
penis
testis
scrotum

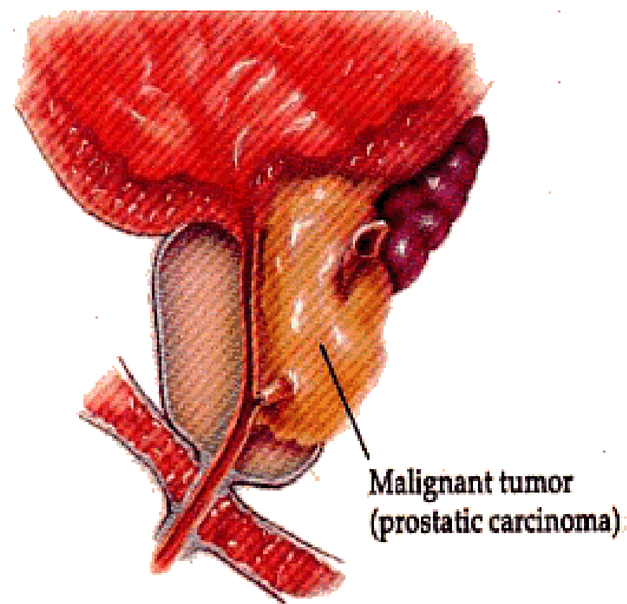

Prostate
Cancer
Rectum
SIZE 1 .5 CM/DIV


T1
T2
Seminal vesicle
Rectum
External urinary
sphincter muscle
T3
T4


Bladder
T1 Tumour
T2 Tumour
Prostate
Seminal
vesicle
T3 Tumour
Urethra


Stage T1
bladder
ureter
ductus deferens
seminal vesicle
prostate
urethra
Stage T2
tumor
Stage T3 or T4
Stage N+ or M+


Stage T1
bladder
ureter
ductus deferens
seminal vesicle
prostate
urethra
Stage T2
tumor
Stage T3 or T4
Stage N+ or M+



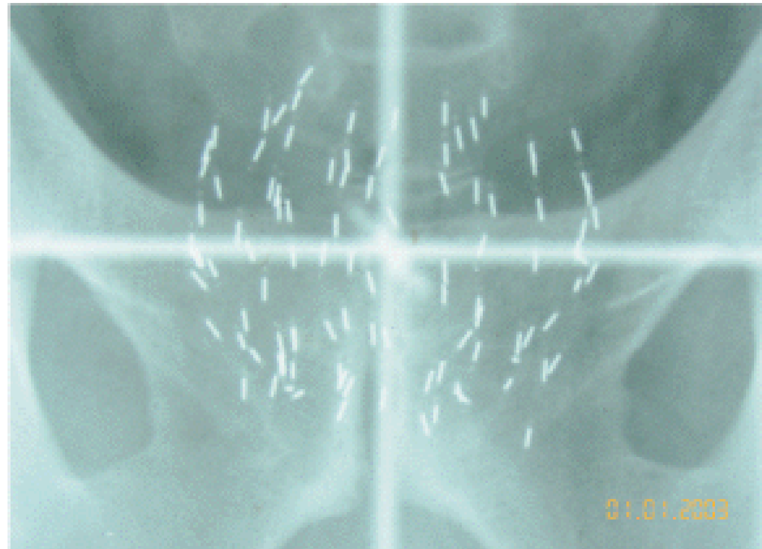
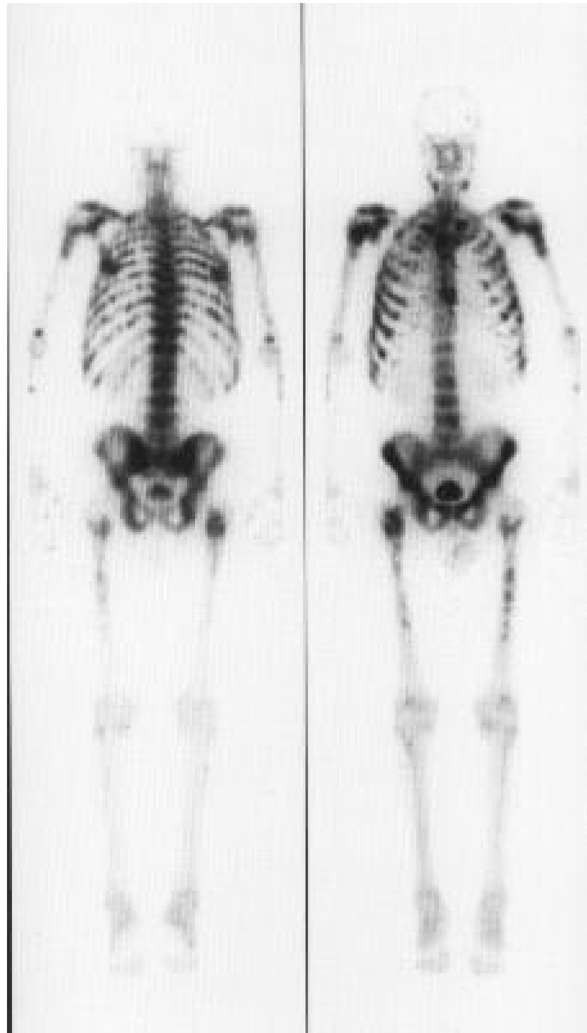
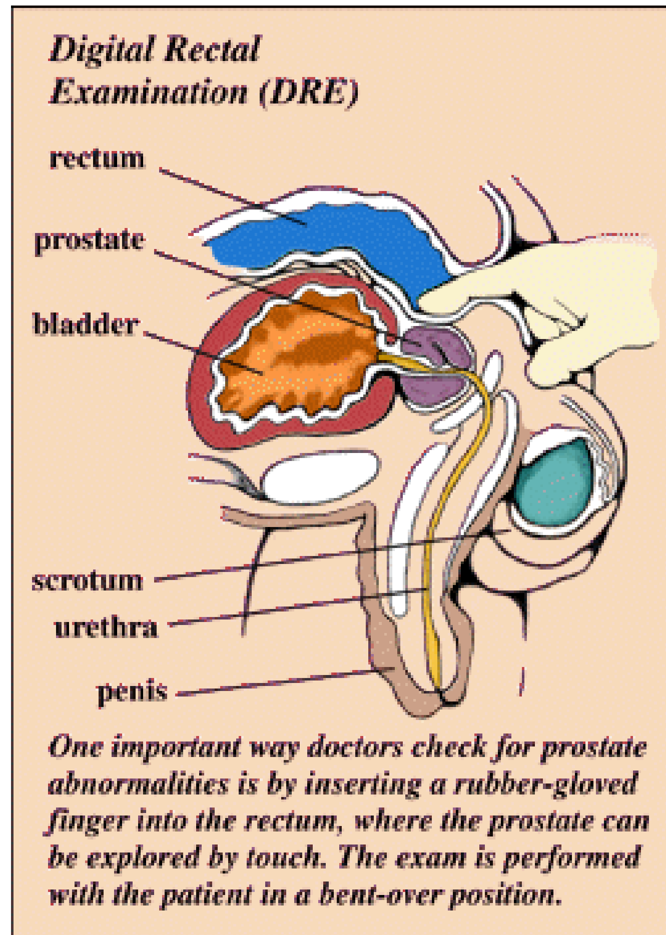


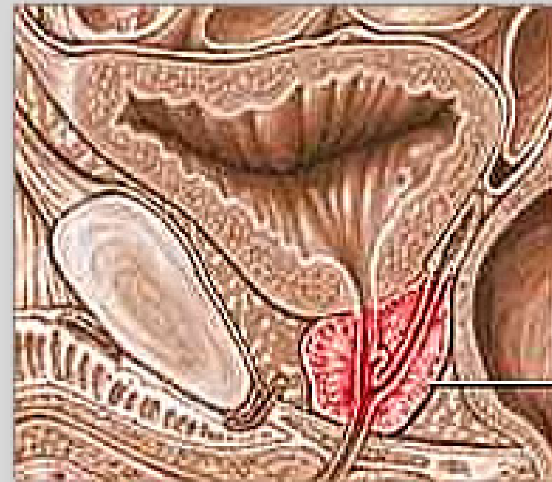
Figure 1. Location of radioactive seeds used in brachytherapy of prostate gland.

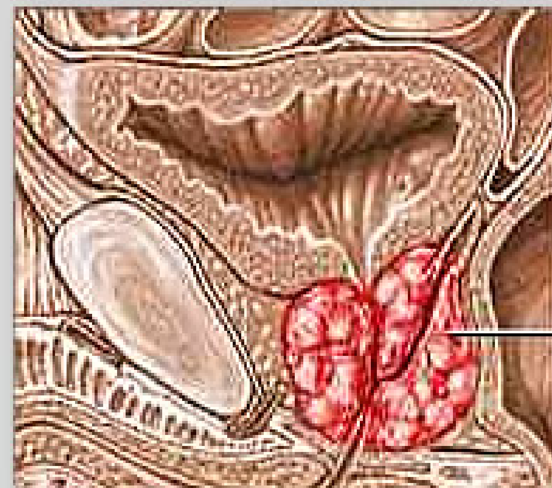
Photos courtesy of Russell Greene, MD, Stormont-Vail Regional Health Center, Topeka, Kan.

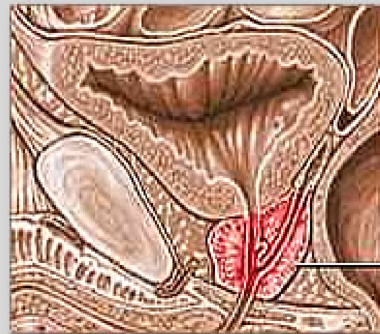


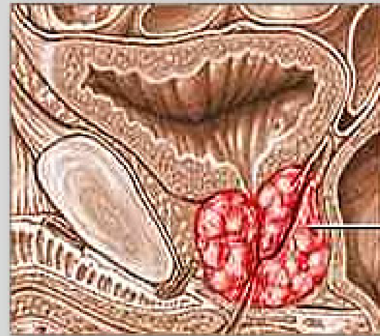


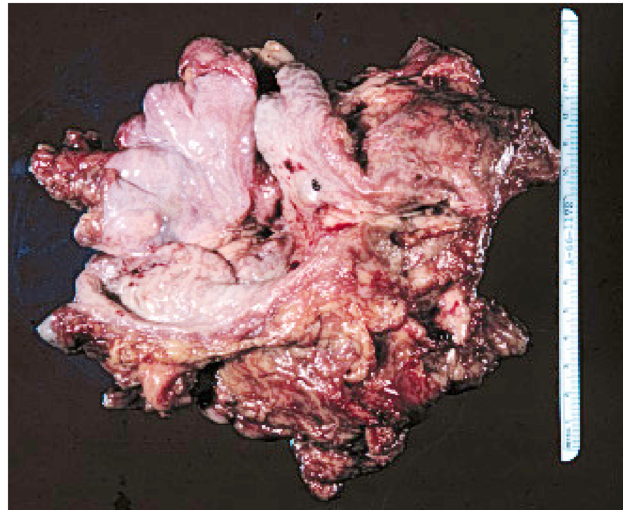
One important way doctors check for prostate abnormalities is by inserting a rubber-gloved finger into the rectum, where the prostate can be explored by touch. The exam is performed with the patient in a bent-over position.

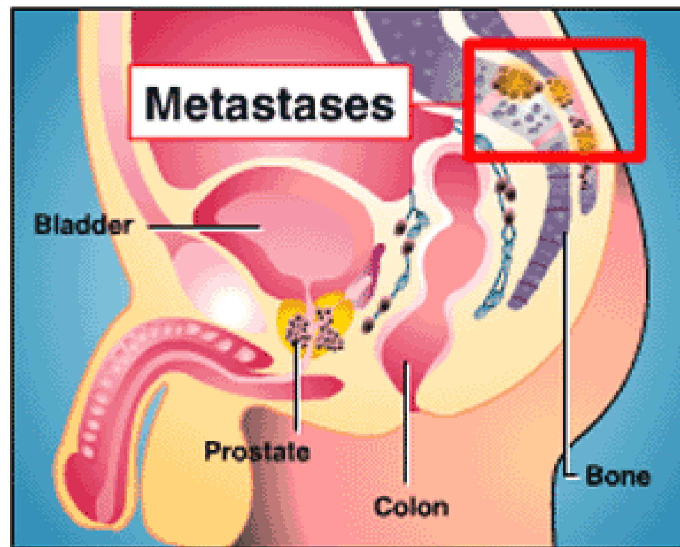

Normal
Prostate

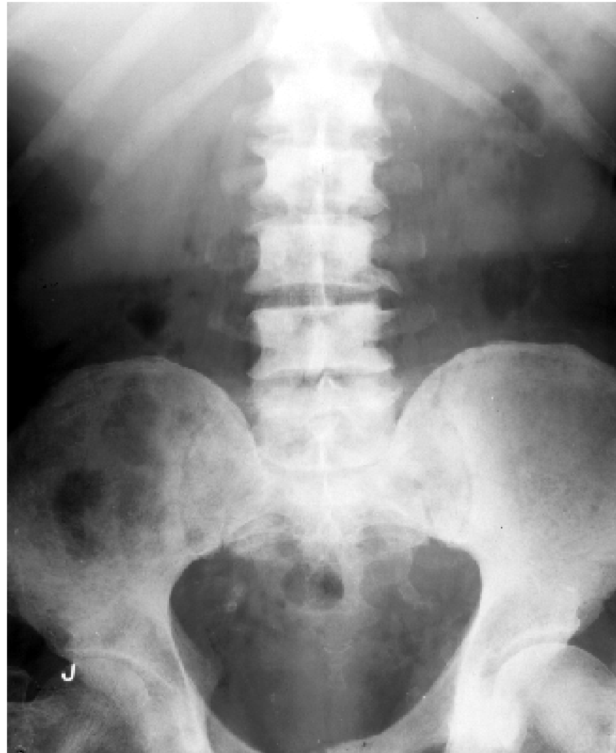

Prostate
Cancer

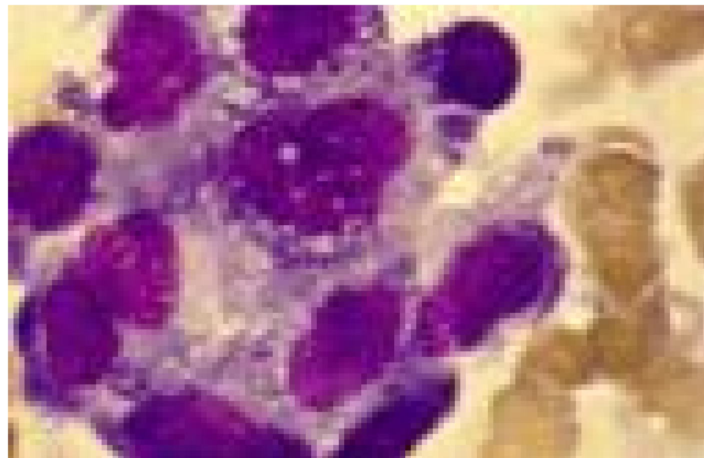

Normal
Prostate


Prostate
Cancer




Metastases
Bladder
Prostate
Colon
Bone





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جامعة النجاح الوطنية
كلية الدراســـات العليـــا

انتشار سرطان البروستاتا في شمال الضفة الغربية 1998 - 2006

إعداد
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إشراف
الدكتور عبد الله بويرات

قدمت هذه الأطروحة استكمالا لمتطلبات درجة الماجستير في الصحة العامة بكلية الدراســـات العليا في جامعة النجاح الوطنية في نابلس، فلسطين.

2006

انتشار سرطان البروستاتا في شمال الضفة الغربية
2006-1989
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منير مصباح صالح شرف
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الملخص

هدف هذه الدراسة هو إلقاء الضوء على مدى انتشار سرطان البروستاتا في شمال الضفة الغربية والوقوف والتركيز على العوامل الخطرة التي تؤثر في انتشاره.

تم جمع 78 حالة من سرطان البروستاتا من المستشفيات الفلسطينية المنتشرة قي شمال الضفة الغربية: المستشفى الوطني, ومستشفى جنين خلال الفترة ما بين سنة 1998 - 2006.

عدد سكان شمال الضفة الغربية هو 750000 منهم 70000 رجل أعمارهم تتراوح بين 40 فما فوق حيث جرت الدراسة عليهم. الطرق الإحصائية المستعملة في هذه الدراسة هي: ANOVA Test, T-Test, Correlation, Chi Squire Test Descriptive Statistics and Frequencies in addition to Percentile Methods.

نتيجة هذا البحث أظهرت أن نسبة انتشار سرطان البروستاتا في شمال الضفة الغربية كانت: 10,4 /100000 لعدد السكان, وكانت النسبة الأعلى لهذا السرطان في مدينة نابلس وأدناها في طولكرم. والجدير بالذكر إن بعد بحث العلاقة لهذا المرض مع التدخين تبين أن نسبته كان عند غير المدخنين أعلى وانه أيضا منتشر بشكل كبير عند العمال مقابل المهن الأخرى, وتبين أيضا ارتفاع انتشاره عند العائلات التي تفوق السبع أطفال فما فوق بشكل كبير مقارنة مع العائلات الصغيرة. ويظهر البحث أهمية الجيل وتأثيره على ظهور المرض حيث أن أغلبية الحالات شوهدت في جيل 65 سنة فما فوق. واظهر البحث أن هناك علاقة مميزة بين عمر المريض و شدة الالتهاب وبين مرحلة تقدم السرطان والعمر. لا شك أن ارتفاع الـ PSA كان ملحوظا عند مريض البروستاتا في شمال الضفة الغربية.

انتشار سرطان البروستاتا في شمال الضفة الغربية اقل من الدول الغربية بكثير ويعود ذلك إلى تناول المواد الدهنية والتي تكثر فيها السعرات الحرارية.