

The Current State of Prostate Cancer Management in Guyana, 2024

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Abstract: **Objective:** To assess the current burden of Prostate Cancer in Guyana and review its treatment modalities. **Design and Methods:** Data was collected using the key performance indicator report from the men's health report with approval. It showed an increase interest for PSA screening over the months of 2024 as the "Guidelines for the Management of Prostate Health" were rolled out; resulting of 13, 688 test. 2600 were elevated and 536 biopsies were done. Clinicopathological data showed 96% acinar carcinoma and 4% ductal cell carcinoma. However, oncological care is limited in brachytherapy and external beam radiation. Palliative care is limited in the public sector for prostate cancer patients. **Conclusion:** Men in Guyana has welcomed the PSA as a screening tool but clinicopathological data showed higher rate of ductal in ductal cell carcinoma than international data. However, more oncological care for prostate cancer needs to implement to aid modern interventions to that of our regional countries.

Keywords: Prostate Cancer, Cancer, Health, Benign Prostatic Hyperplasia.

1. Background

A. Introduction

Globally, Prostate Cancer is the second leading cause of cancer deaths and the leading cause of cancer deaths among men in the Caribbean. The burden of prostate cancer is expected to worsen to the extent that Rebbeck et al predict a doubling of prostate cancer related deaths between 2010 and 2030. GLOBOCAN outlines a greater incidence of prostate cancer in the Caribbean and accounts for a larger percentage of deaths. Age Standardized Rate (ASIR) rate for PCa in the Caribbean is 26.4 per 100,000 mortalities in males in 2022; which is the highest in the World (Wong et al, 2019).

Guyana as the only English-speaking nation in South America who mirrors with cultural and ethnic makeup to that of the English-speaking Caribbean, especially Trinidad and Tobago. It is a multiethnic society making up of predominantly East Indian (40%), Africans (26%) and the remaining are Chinese, Amerindians, Portuguese, Europeans and mix race (PAHO/WHO, 2015). Hence, the burden of prostate cancer in Guyana is therefore expected to be similar like their regional counterparts.

In Guyana, Prostate Cancer is the most common cause of

cancer related deaths and the most common cause of cancer deaths among men (Guyana Cancer Burden, 2020-2023). Its demographics aligns itself to the coastal areas, highland regions and far out areas. This made it difficult for access to healthcare, however the need to decentralize and create equitable care needed and urgent review. Notwithstanding the stigma towards screening using the Digital rectal examination (DRE) has hinder the urgency for men in Guyana to request voluntary screening.

Hence, the Ministry of health, Guyana has launched "Guidelines for the management of Prostate Health," in November 2024, which outlined a national screening program using the Prostate specific Antigen (PSA) as one of the screening tools. This is done on a voluntary basis in the primary care setting (Guidelines for the management of Prostate Health, 2024). Since it's awareness and roll out campaign; with private and public sector involvement, a total of 10,225 PSAs were done and 2045 were elevated. Notwithstanding, 413 biopsies were done. This corresponded to a criterion developed by the Ministry of Health, Men's Health team, using the Guyana Cancer Burden data, to start screening at 45 years and high-risk persons at 40 years (*Appendix 1*). This screening is tailored with urological clinics in the regions due to urologists mainly located in the coastal area. Hence, creating equal opportunities and services to the outlying areas.

This paper provides a concise synopsis of the prostate cancer care pathway in Guyana to highlight capabilities of the healthcare system to manage this important disease. Other developing nations can compare this to their own PCa care pathways. This can help to stimulate dialogue, influence policy and ultimately improve care.

2. Objectives

1. To assess the current burden of prostate cancer in Guyana.
2. To review the current treatment modalities and avenues for growth.

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3. Method

A. Rationale of Study

This study was done to generate valid and reliable information on the usefulness of the current state of prostate cancer management in Guyana, 2024. Regionally, our Caricom nations have seen similar trends of increase in prostate cancer, and it has become the leading cause of cancer mortality in men. Hence, a review on the current state will be pivotal to assess for further growth and improvement in the local two-tier system in Guyana. It will also limit the possibility of bias and increase meticulousness on further evaluation.

B. Searching Strategy

Various online databases were used for relevant information on the Current state of prostate cancer management in Guyana, 2024. The searching strategy highlight for the purpose of this study retrieving information from the relevant literature will meet all the inclusion and exclusion criteria.

To attain the adequate research study answers, from the proposed question many key words should be researched such as, 'Prostate Cancer,' 'Caribbean,' 'Prostate Cancer treatment,' 'Risk Factors for prostate cancer,' 'Guyana,' 'Caricom' 'advantages,' 'disadvantages,' 'etiology,' 'Current' and 'impact' would be used for the study. Also, Boolean operators would be used to narrow down perspectives and reduce time spent on irrelevant search results. A Boolean search was accomplished using the term 'AND', 'OR' and 'NOT' to unite the search terms to explore the relevant articles from the databases.

Local, database on key performance indicators within the Men's Health Unit, MOH, Guyana, within the Callender year 2024.

C. Inclusion and Exclusion Criteria

When exploring the relevant literatures for this study, many abstracts were scrutinized under the fixed inclusion and exclusion criteria. These criteria are formulated to ensure no ambiguity and remain inclined to the objectives of this research. Additionally, the criteria have not limited the boundaries for the research objectives but adequately create a reach for relevant literature.

The inclusion and exclusion criteria used in the present study is outlined in table 1.

4. Ethical Issues

Permission for commencement of the data collection phase of the research was sought from the Chief Medical Officer (CMO), Ministry of Health as well as the head of department of Primary Healthcare Services Department without which the research cannot proceed. IRB approval is in process for

proposal approval.

No name will be recorded; rather a code will be assigned to each institution to maintain confidentiality. All information obtained from the study will be kept under close supervision and will not be disseminated in any way to maintain privacy. Data Will be store in an Electronic database and password protected. Informed consent will be obtained from the patients before any data is collected. This data will not be discarded until the approval of the CMO 's Office, MOH. To note this study does not involve any human participation.

5. Results

Table 2

Regions	Number of Test	Elevated PSA
1	60	7
2	304	45
3	239	79
4	11224	2022
5	304	88
6	538	122
7	94	27
8	7	2
9	236	26
10	682	182
Total	13688	2600

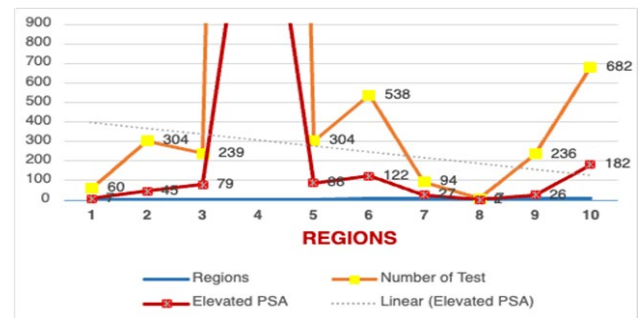


Fig. 1. Distribution of PSA test vs elevated PSA with the administrative regions of Guyana

A retrospective review of the year 2024, was done using the "The guidelines for the management of Prostate Health." This has applied the use of one of the screening tool Prostate Specific Antigen (PSA) test for Prostate cancer.

All 10 administrative regions in Guyana were able to acquire PSA machines and testing reagents in 2024 at the regional hospitals.

Over the year data respondents for total PSA were 13,688 tests, with a distribution of:

Administrative Region 4 has shown the largest number of PSA and elevated PSA, which also has the largest population distribution in Guyana and the largest number of men who fit the screening criteria. Region 8 has the lowest test due to demographics and delayed implementation of laboratory equipment. A distribution ratio of 1: 5 can be analyze for the

Table 1

Inclusion Criteria	Exclusion Criteria
Only primary studies	Studies except primary research
Studies conduct in the Caribbean	Studies conducted out of the Caribbean wouldn't be included
Studies are in English	Studies that are not in English
Studies that were published after 2013	Studies that were published before or in 2013
Studies that use Prostate cancer as their platform	Studies that excluded prostate cancer as their platform
MOH, Guyana Report on Prostate cancer, 2024	Exclude other Report on MOH, Guyana, 2024

elevated PSA vs number of test as compared to NCCN guidelines 1: 4 in the Caribbean Region.

Table 3

Regions	Elevated PSA	Biopsies
1	7	0
2	45	3
3	79	0
4	2022	484
5	88	0
6	122	22
7	27	9
8	2	0
9	26	3
10	182	15
Total	2600	536

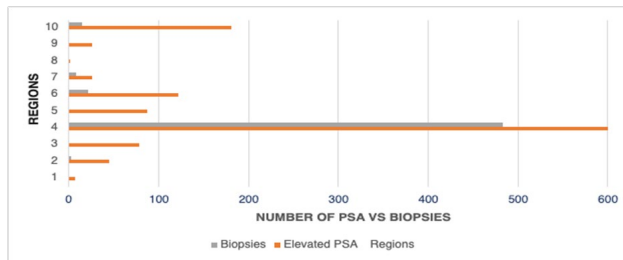


Fig. 2. Number of elevated PSA vs biopsies done

In 2024, all administrative regions were able to have a trained urology government medical officer (GMO), attending to clinics within three months period intervals to preform biopsies and review elevated PSAs.

Table 4

Region and facilities reporting	
Regions	Name of facilities
1	Mabaruma Hospital
2	Suddie Hospital
3	West Demerara Regional Hospital
4	GPHC
	St Joseph Mercy Hospital
	Balwant Singh Hospital
	Woodlands Hospital Inc.
	Eureka Medical Laboratory
	New Vision Laboratory
	Medway Specialty Center
	Surgical Associates Guyana
	Dr Leslie Persaud Health Care Institute
5	Fort Wellington Hospital
5	Mahaicony Regional Hospital
6	New Amsterdam Regional Hospital
6	Skeldon Hospital
6	Anamaya Memorial Hospital
7	Bartica Regional Hospital Complex
8	Madhia Regional Hospital
9	Lethem Regional Hospital complex
10	Linden Hospital Complex
NGO	Guyana Cancer Society

A total of 22 health facilities have been reporting of the year, 2024, of which 9 are private sector driven and 1 NGO.

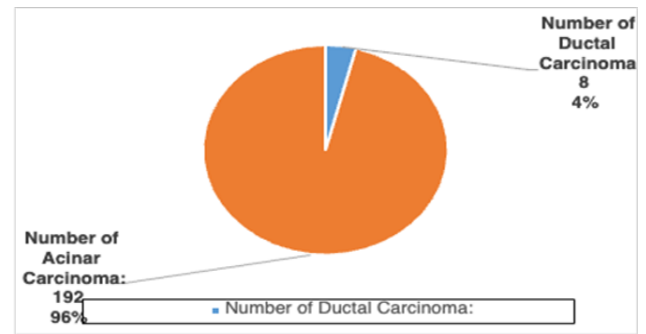


Fig. 3. Pie chart of type of prostate cancer in Guyana

This has reported a total of 200 positive test in Guyana. Ductal cell carcinoma accounts for 4% of cancer while acinar carcinoma accounts for 96%.

Table 5

Ethnicity	2020	2021	2022	2023
Afro Guyanese	61 (64%)	71 (67%)	73 (57%)	78 (48.8%)
Indo Guyanese	17 (18%)	17 (16%)	23 (18%)	30 (18.8%)
Mixed	5 (8%)	5 (5%)	8 (6%)	15 (9%)
Amerindian	8 (8%)	1 (1%)	4 (3%)	3(2%)
Others	3 (3%)	8 (8%)	4 (3%)	4 (3%)
Unknown	1 (1%)	3 (3%)	18 (14%)	30 (19%)

Afro Guyana have been more common to die from prostate cancer over the period 2020-2023 in Guyana, followed by the least affected being the Amerindians.

Table 6

Variables	2020	2021	2022	2023
	n= 96 (%)	n= 106 (%)	n= 129(%)	n=160 (%)
<i>Age</i>				
0-19yrs	0	0	1 (0.7%)	0
20-29yrs	1 (1%)	0	0	0
30-39yrs	0	0	0	0
40-49yrs	2 (2%)	1 (1%)	3 (2%)	0
50-59yrs	8 (8%)	6 (6%)	10 (8%)	5 (3%)
60-69yrs	28 (29%)	19 (18%)	36 (29%)	52 (33%)
70+yrs	53 (55%)	52 (49%)	64 (50%)	99 (62%)
Unknown	4 (4%)	28 (26%)	15 (12%)	4 (3%)

As a man aged it is observed he is more likely to develop prostate cancer, however it is rare in the youth population, but an unexpected postmortem report highlighted a 19-year-old.

These data were generated from the cancer registry of Guyana, and the Men's Health Unit.

6. Discussion

A. Human Resources

The medical system in Guyana, has both private and public sectors which has urologists that serve mainly the coastal area. A total of three (8) urologists who are attached to the Georgetown Public Hospital Corp. (GPHC), New Amsterdam Regional Hospital and Sheriff General Hospital; Dr Balwant Singh Hospital, Mercy Hospital and Woodlands Hospital Inc. This distribution supports the population density mainly Georgetown, and New Amsterdam. This has put Guyana's ratio of male patients to urologist to 1:35000.

However, this skewed distribution of urological care results in General Practitioners (GP) serving the urological unit in the

regional public system. Hence, igniting the creation of the urology program with University of Guyana and Georgetown Public Hospital Corp., in 2024. Notwithstanding the constant support from the Ministry of Health, Men's Health Unit, over the year, decentralizing of urological care via outreaches with consultants, residents and GMOs within the urology department has propel more awareness among the far-out regions. This is creating an equitable distribution of care within the regions.

B. Screening for Prostate Cancer

Although the debate on Prostate Specific Antigen (PSA) and Digital Rectal Examination (DRE) on their superior benefits for the screening of prostate cancer; it can safely outline that PSA has substantially created a downward shift in the prostate cancer cases over the past two decades in the United States (McDonald et al, 2015). Within the Caribbean 50% of men present to the urologist with symptoms, locally advanced and/or metastatic disease (Persaud et al, 2018[B]).

The establishment of a screening tool which targets asymptomatic men can only be achieve using the PSA, since the stigma towards the DRE has ignite a degree of fear, anxiety and unwillingness to be screened (Ocho et al, 2013). In a survey done among urologists registered under the Caribbean Urological Association (CURA); 66.7% of the urologists believe PSA screening has positively impacted survival in their patient population (Persaud et al, 2018 [A]). Notwithstanding, the need to have DRE as part of the screening protocol unto the work up of the patient. This recurrence of having a PSA should be annually and not biannually among men in the Caribbean community (Persaud et al, 2018).

Table 7
Perceptions about the impact of screening (Persaud et al, 2018)

Do you believe, based on your experience, that PSA screening has positively impacted survival in your patient population?		
Answer options	Response %	Response count
Yes	66.7%	20
No	20.0%	6
Don't know	13.3%	4
Answered question		30
Skipped question		0

The support to establish a local guideline by urologists in the Caribbean amounts to 30%, while the majority believes a regional Caribbean community guideline should be established. However, Guyana, has a multiethnic society with different culture and genetics which will be at a disadvantage to its Caricom partners if it must mirror itself to the Caricom configuration (Persaud et al, 2018).

In Guyana, the Cancer registry has outlined in its Cancer Burden report 2020-2022 on PCa having the high mortality among other cancers (Guyana Cancer Burden, 2020-2022). Hence the establishment of current screening protocols (Appendix 1). This led to screening all men at the age of 45 years and high-risk men at 40 namely, men with family history and African ancestry (Appendix 1). The use of the PSA screening tool was outlined to be the tool of promotion to allow men the comfort in conducting their screening and not

highlighting the negatives of an "assault to their manhood."

This creates avenues after a needs assessment to equip the regional laboratories in Guyana with the capacities to conduct PSA testing and training of community health workers, nurses, medexes, laboratory personnels, public health nurses and doctors using the screening guidelines. More men, have come fort to be screening regionally, establishing content to the PSA screening method, while others who have received elevated PSA, agreed to DRE upon share decision making with their practitioner. A total of 22 laboratories are reporting PSA data to men's Health unit.

Since the establishment of this program in 2024, a total of 13688 men were screening in the 10 administrative regions in both public and private sector. A sum of 2600 PSAs were elevated, and 510 biopsies were done. 200 biopsies showed positive results for cancer, namely ductal cell carcinoma 4% and acinar carcinoma 96%. This is very unusual from international data. Only 1 % of the general population is subjected to have ductal cell carcinoma (Kim et al, 2015).

There has been the involvement of NGOs such as the Men on Mission (MOM) initiative and the Guyana Cancer society which promotes the awareness along with the Ministry of Health, Guyana among the population.

C. Treatment

Generally, the current state of management for the management of prostate cancer has improved over the last three (3) years. This is credited to the increase in Urologist and oncologist in Guyana. However, more awareness on screening using the PSA has caused more males to opt for voluntary screening.

1) Active Surveillance

Active surveillance is practiced in the Caribbean and Guyana using the Epstein Criteria. These patients should be classified as low-risk, low-volume prostate cancer with clinical stage of T1- T2a, PSA ≤ 10 ng/dL, Gleason score ≤ 6 , <3 cores positive with $\leq 50\%$ of core involvement and PSA density ≤ 0.15 ng/mL. The aim of active surveillance is to avoid the overtreatment of clinically insignificant cancers and with it the adverse effects of prostate cancer treatment (Persaud et al, 2017[C]). There is concern about the application of active surveillance to men of African descent and it is therefore still unclear whether active surveillance is a safe option for our Caribbean men. Active surveillance is an option to patients throughout the country although there is no uniformity, and protocols are at the judgment of the treating urologist.

2) Brachytherapy

This form of treatment involves the implantation of radioactive seeds within the prostate gland under the guidance of X ray and ultrasound guided methods. Approximately 70% of men diagnosed with prostate cancer present with low- or intermediate-risk disease. Continuous low-dose-rate (LDR) irradiation, brachytherapy is considered as an option for patients who have favorable intermediate-risk disease (Gleason 7, prostate-specific antigen <10 ng/mL; or Gleason 6, prostate-specific antigen 10-20 ng/mL) (Petereit et al, 2015). It is boosted to be less costly and more direct treatment to abnormal

cells, since cancer cells DNA are less rigid and subject to repair.

However, this treatment of oncological care is NOT available in Guyana, but patients are referred to Trinidad and Tobago for seed placement at San Fernando Hospital. The Government of Guyana (GOG) subsidizes some percentage of payments towards oncological treatment which are not available locally.

3) *External beam Radiation*

Currently, this is one of the primary treatment managements for PCa in Guyana and is AVAILABLE in the private sector, at the Guyana Cancer Institute (GCI). These costs are subsidized by the GOG under an aid program by the MOH, Guyana.

4) *Treatment of Advance Prostate Cancer and Metastatic Diseases*

The treatment of advance stage prostate cancer and metastatic diseases are treated with Docetaxel. ADT with Zoladex or Casodex are NOT within the public system but are available in small dosages within the private sectors.

a. *Androgen Therapy*

Surgical castration in the form of bilateral orchidectomy was the original method of androgen deprivation and is still widely performed today. Given the potential psychological impact of orchidectomy as well as the emerging role of intermittent androgen deprivation therapy many men have opted for chemical castration (Rhudd, 2021 and Persaud et al, 2018). In Guyana, both methods of care are practice depending on the availability of care, such as far out areas will opt for castration while urban patients will see opt for more androgen deprivation therapy. These are methods of care are available in both tiers of care.

5) *Palliative Care*

Palliative care is offered more as a specialize care in the private sector, namely Beacon and this if complemented by the oncology clinic at GPHC. Most local health centers would provide regular home visits and the application of the ICOPE screening criteria on their patients.

7. Conclusion

In Guyana, PCa was reported more in persons of African Ancestry which is like their CARICOM counterparts. However, with the establish of the Guidelines for the management of prostate cancer in Guyana, we have seen more men voluntary opting to be screening using the PSA. In addition, men are now able to receive biopsies within their respective regions with no cost burden unto them. However, limited oncological care are present in the management and treatment of mirror our Caricom counterparts.

More training to be added to local urologist for the management of brachytherapy and local market suppliers. Also, more Imaging technique are required such as the multiparametric MRI (mpMRI) scan, which will advance our screening and diagnostic capacity.

Understanding the current state of prostate cancer management in Guyana is essential for the Ministry of health (MOH) to create future policies and plans to improve the quality of care.

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Appendix 1

Detection and Screening

Prostate cancer screening reduces cancer-related morbidity and mortality. However, there is the risk of over-diagnosis and over-treatment since some cancers may never become clinically relevant in a man's lifetime. Active surveillance as a management modality for apparently indolent cancers reduces the risk of overtreatment in the management of such cancers.

A. *Screening Tools: Prostate-Specific Antigen and Digital Rectal Exam*

The following tests are recommended in the detection of prostate disease at its earliest stages:

- *Prostate-specific antigen (PSA) blood test:* This test measures levels of PSA, a protein produced by the prostate gland, in the blood. The PSA is a glycoprotein secreted by prostatic epithelial cells, and its protease activity lyses the clotted ejaculate to enhance sperm motility. Although primarily confined to seminal plasma, it can trickle into circulation. *To note, PSA is not a cancer-specific marker as such;* elevated PSA can be a result of other conditions, such as prostatitis, and BPH.
- *Digital rectal exam (DRE):* During this exam, the doctor inserts a gloved finger into the rectum to feel for hard, lumpy, or abnormal areas of the prostate.

1) *Screening Age*

All men who are between 45 - 70 years and older.

B. Screening Criteria

- Healthy male with no signs or symptoms (known as asymptomatic) and no close blood relative to the disease
- ≥ 45 - 70 years old
- Family history of prostate cancer/ lung cancer/ ovarian or colon cancer
- Race: ALL
- All persons of high risk should be screened at 40 years

1) Frequency of Testing

- An annual test is the best advice.

2) Age to Initiate Testing

- 45 years for the general population and 40 years for high-risk groups
- High-risk groups include persons with a family history of prostate cancer

3) Age to Discontinue Testing

- The screening for prostate cancer should be discontinued at age 70 years.

C. Reasons to Defer PSA Testing

Certain factors can elevate PSA and affect its performance as a screening test. In the presence of any of these factors, it is appropriate to temporarily defer PSA screening long enough for a transient PSA elevation to resolve.

- Symptoms suggesting bacterial prostatitis; defer PSA testing until six to eight weeks after symptoms resolve
- Acute urinary retention or urethral instrumentation; defer PSA testing for at least six weeks
- Recent prostate biopsy or transurethral resection of the prostate (TURP); defer PSA testing for at least six weeks

Additionally, a patient who is repeating a PSA test to evaluate a result that was close to a cutoff that could prompt urologic evaluation, should abstain for at least 48 hours from activities that can transiently increase PSA levels (e.g., ejaculation or bicycling).

If DRE was performed, PSA could be measured immediately afterward because DRE leads to only minimal transient PSA elevations of 0.26 to 0.4 ng/mL.

Interpretation of PSA Results:

A PSA of ≥ 4.0 ng/mL has been the most widely accepted standard to balance tradeoffs between sensitivity and specificity.

D. Indications for Referral to Urology

- PSA ≥ 4.0 ng/mL – Refer patients for urology evaluation if the PSA is ≥ 4.0 ng/mL. Prior to referral, if the PSA is between 4.0 and 9.9 ng/mL, repeat the testing in six to eight weeks because PSA may be transiently elevated by certain modifiable benign factors (and any identified factors should be addressed prior to repeating the PSA test)
- Rise in PSA while on 5-alpha reductase inhibitor – A patient taking finasteride or dutasteride for BPH with a confirmed PSA level rise >0.5 ng/mL (over any time frame) should be considered for urology referral.
- Abnormal DRE – Although DRE is not suggested for screening, if DRE is performed, males with nodules, induration, or asymmetry on prostate examination should be referred to a urologist for evaluation, regardless of the serum PSA level. However, symmetric enlargement and firmness of the prostate are frequent in males with BPH and do not typically warrant urologic evaluation unless the PSA is elevated or there are other concerns.

E. Benefits and Harm of Screening

The best available evidence found that screening has, at most, a small benefit in reducing prostate cancer mortality and the risk of developing metastatic disease.

The potential benefits of screening must be balanced against the potential harm to quality of life, including the risks of false-positive tests, prostate biopsy, anxiety, overdiagnosis, and treatment complications

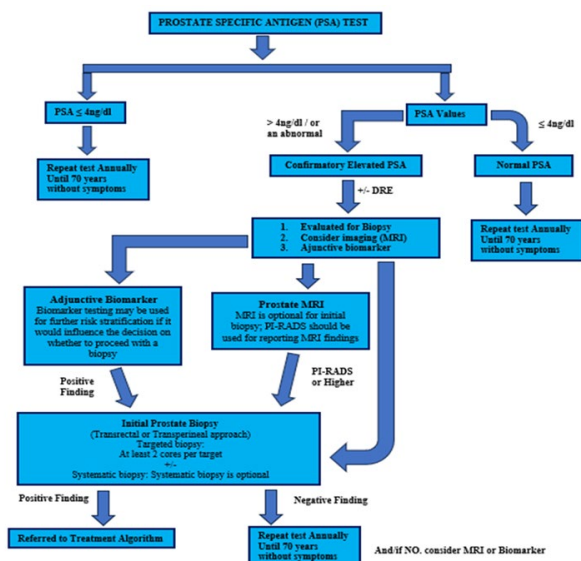


Fig. 1. Prostate cancer screening using the PSA