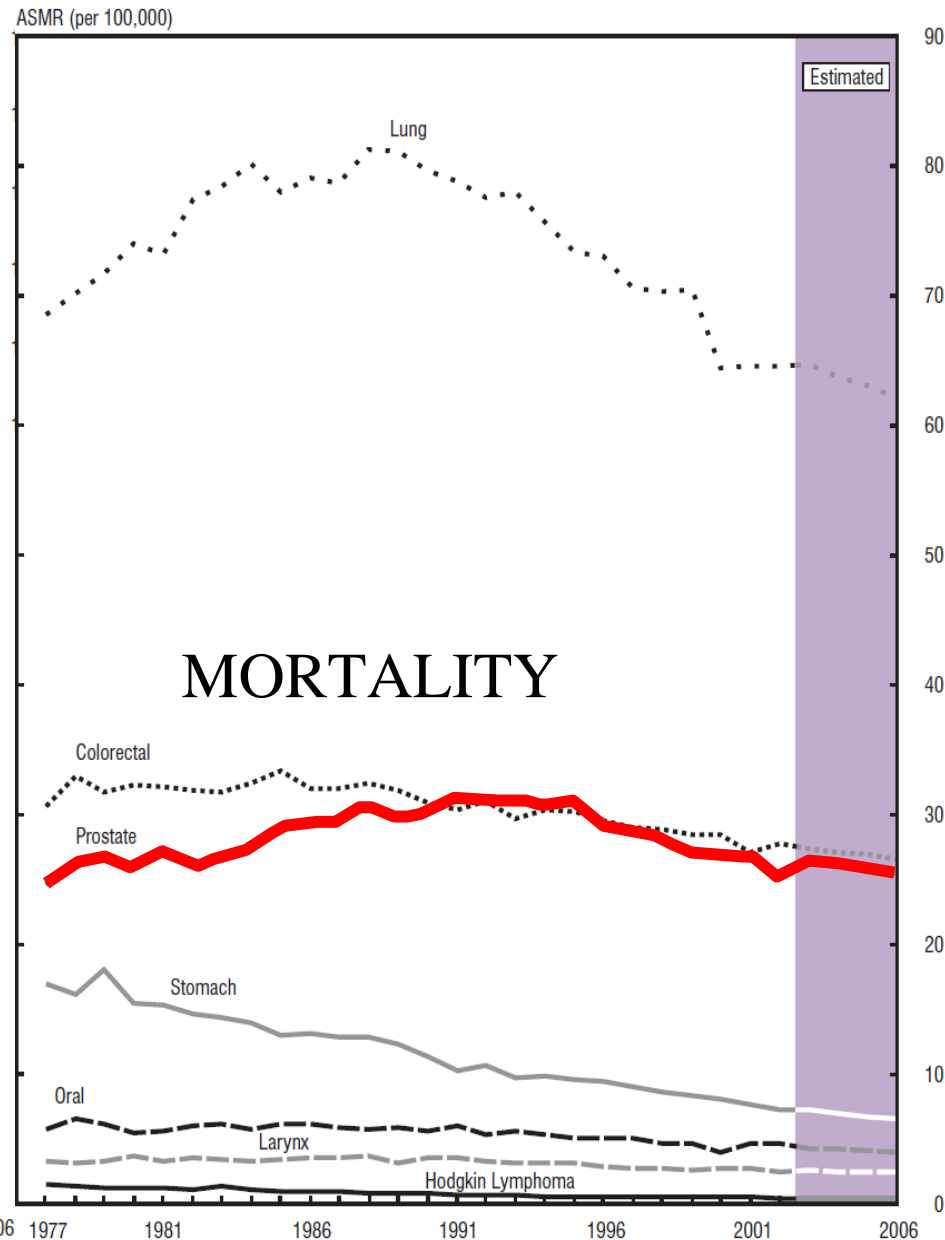
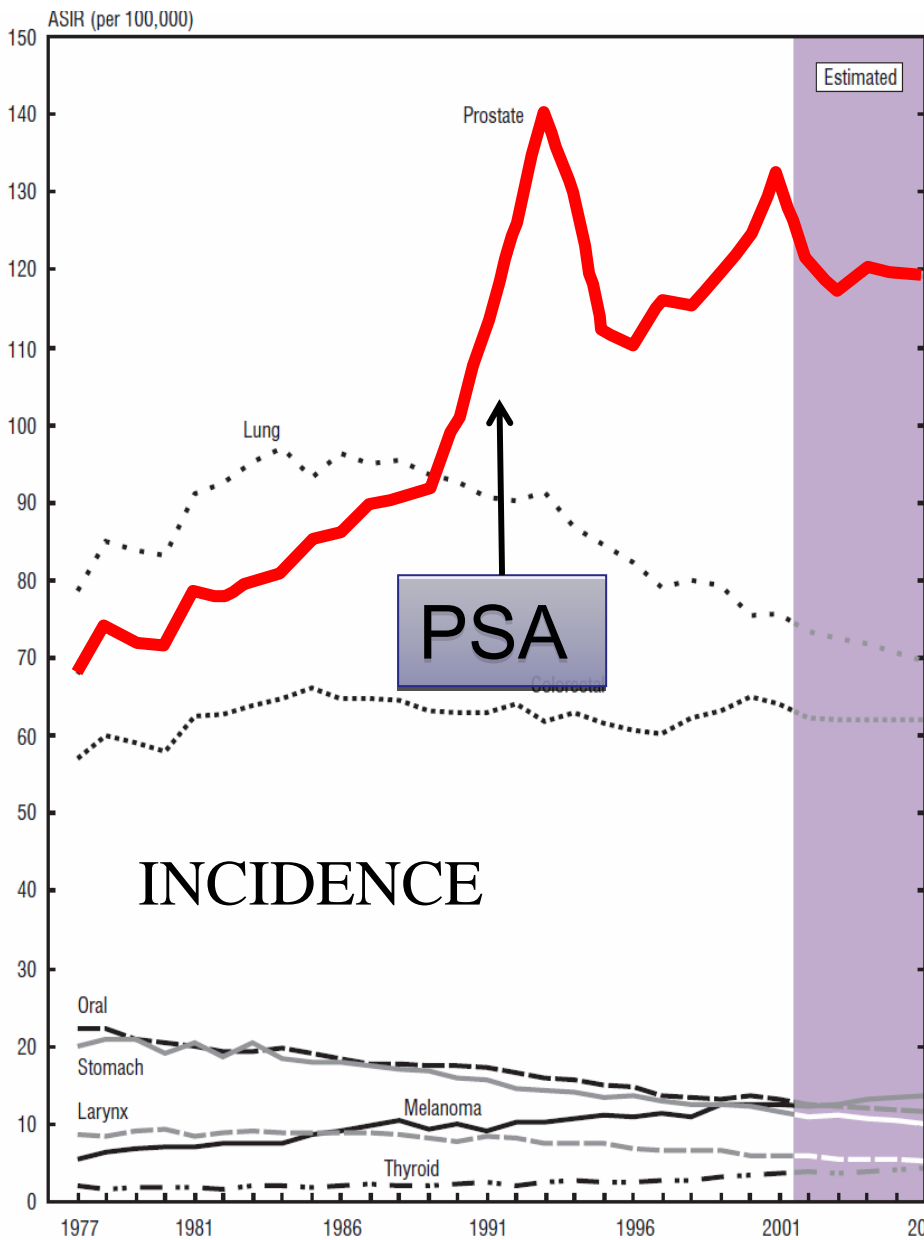


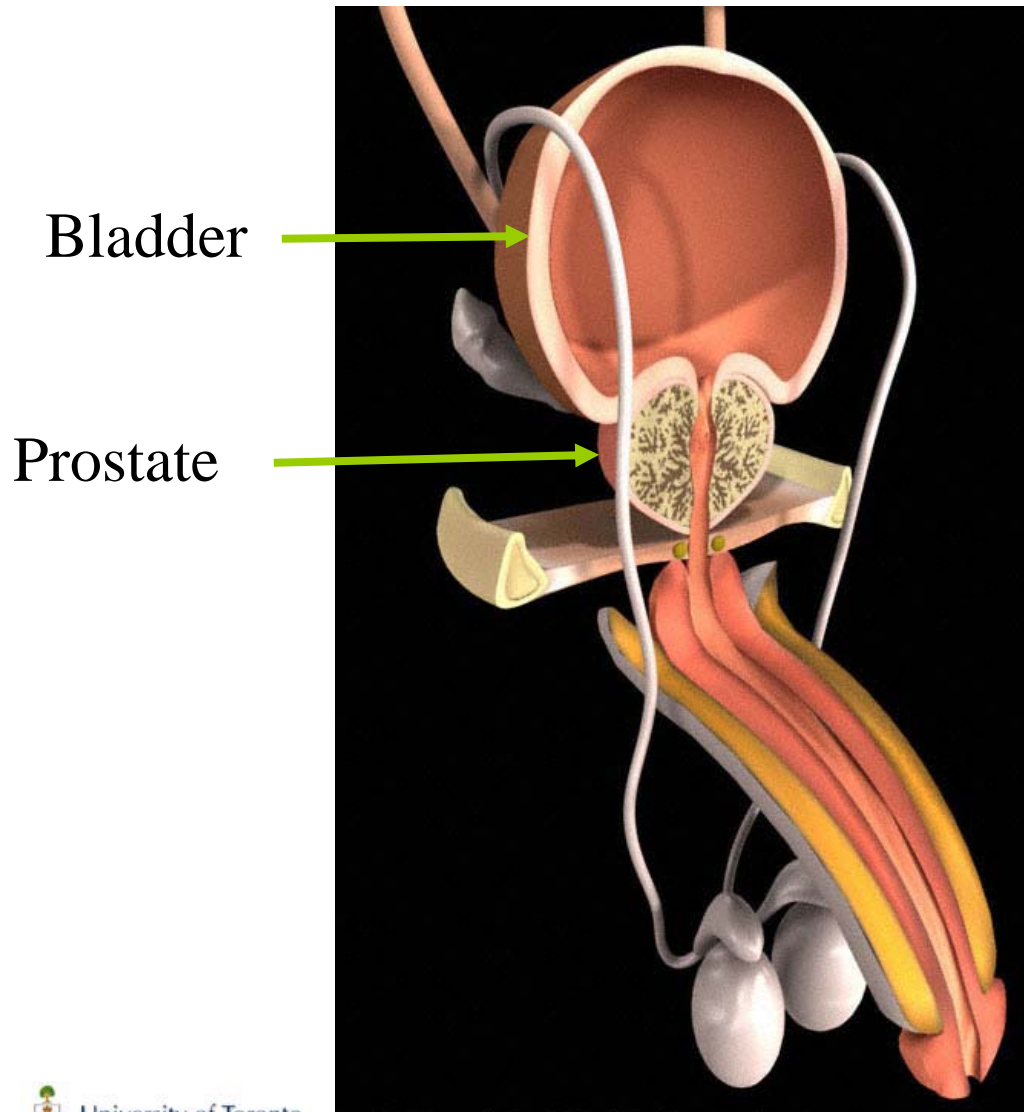


Why is PSA testing still important?

Gerard Morton MD FRCPC
Dept of Radiation Oncology



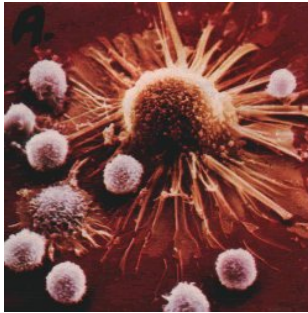
Anatomy



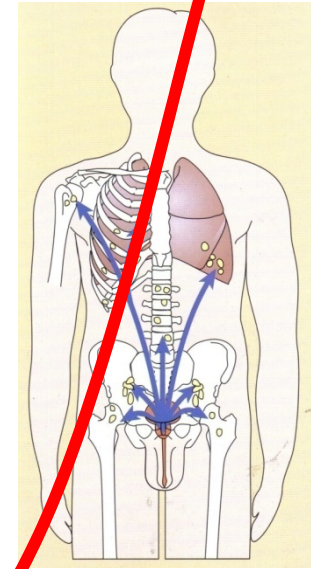
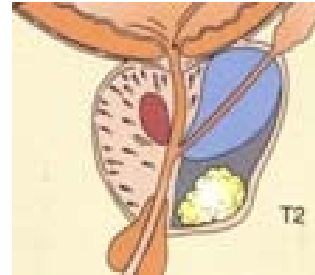
Function:
Produces Semen
Bladder Control

Prostate Cancer

Latent



Clinical



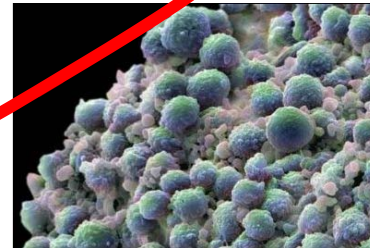
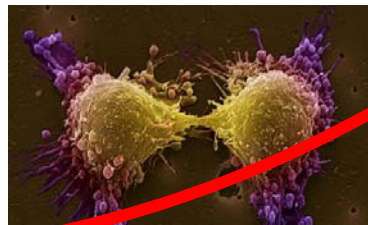
Metastatic

40

60

80 yrs

PSA Level



Divide and Multiply

What is Prostate Specific Antigen?



- A protein found in seminal fluid and manufactured by the prostate
- Purpose is to keep the semen liquid
- A small amount can get into the blood and be measured – the PSA level

The Story of Prostate Specific Antigen (PSA)

1960s-70s research on semen

- Forensic Medicine
 - Dr Hara found protein called “ γ -seminoprotein” to identify semen in rape victims
- Fertility Reasons:
 - Protein called “E2” isolated from semen
 - Investigators had hoped it could be used as a contraceptive



The Story of Prostate Specific Antigen (PSA)

- 1979: Prostate Antigen found in the prostate identical to E2 and γ -seminoprotein
- 1980: Prostate Antigen, Prostate Specific Antigen (PSA) found in the bloodstream of men with metastatic prostate cancer

PSA Detection Kit

Home Infidelity Prostate Specific Antigen (PSA) Semen Detection Test Kits

[Order the most accurate and conclusive laboratory semen detection available!](#)

[New Saliva Detection Kit](#)

[Blood Detection Kit](#)

[Dedicated Semen Detection Website](#)

***** **THE MOST ACCURATE HOME SEMEN DETECTION TEST AVAILABLE** *****

WARNING - HOME AP TESTS WILL GIVE YOU FALSE POSITIVES AND NEGATIVES

[\(Read why home AP kits should be outlawed\)](#)

[Prostate Specific Antigen \(PSA\)](#) [Shipping](#) [Bulk Dealer Pricing](#)



[Order one of the semen detection kits below if you would like to determine if a stain or fluid is semen.](#)



Ladies panties are the #1 tested item

[Semen Detection Statistics](#)

[Semen Detection Report Samples](#)

- ◆ **Prostate Specific Antigen (PSA) Semen Detection Home Infidelity Test Kit** - This test is not presumptive like the Acid Phosphatase (AP) test commonly found on the internet. A positive reaction with a PSA test means the prostate specific antigen found only in semen is present. We no longer offer the AP test kits ([read why](#)).

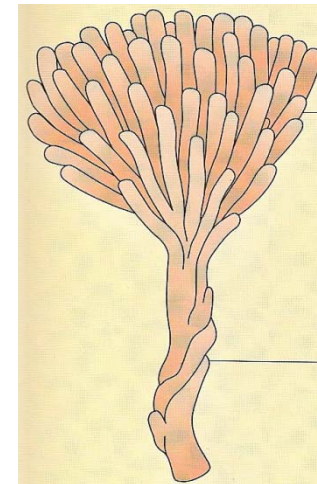
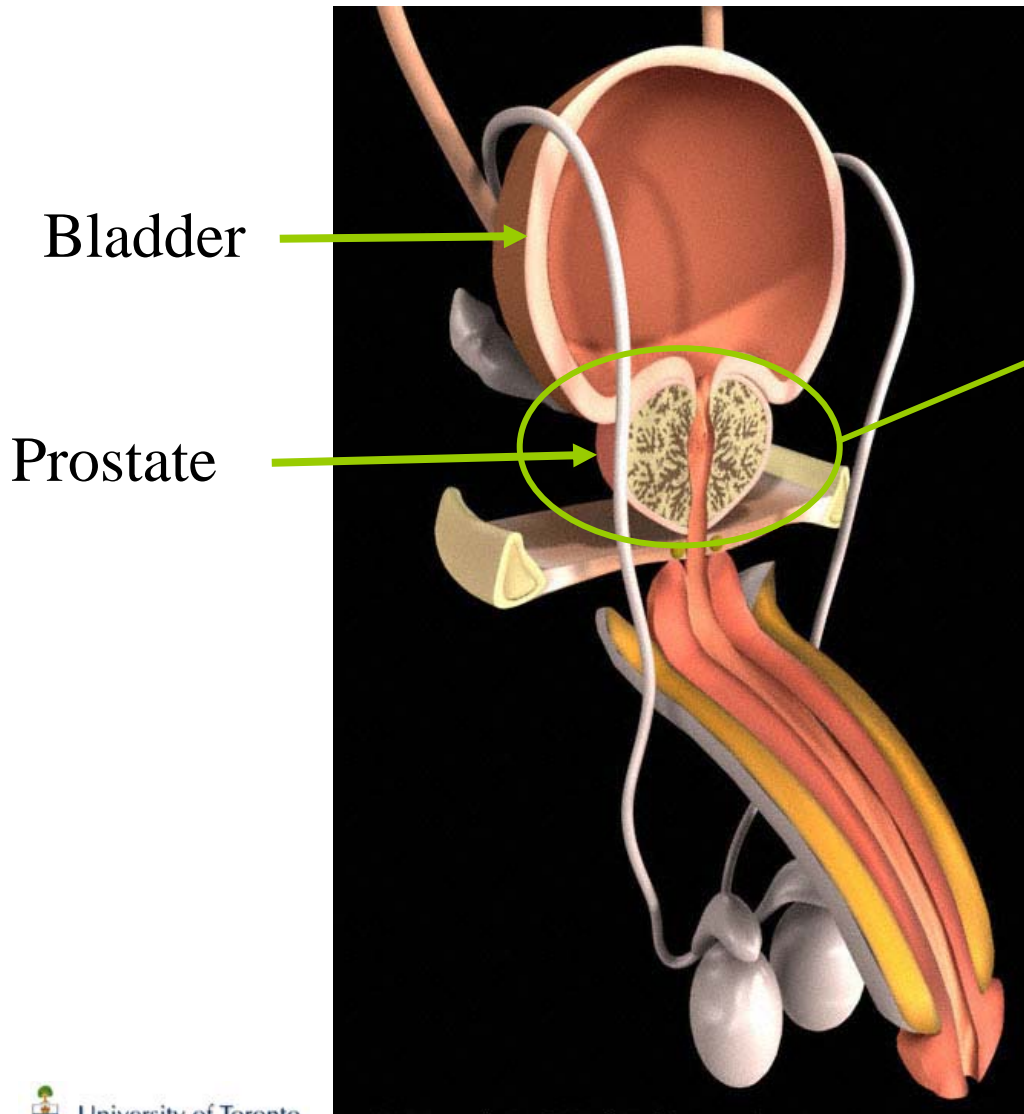
- PSA Infidelity test kit includes all supplies for one test.
 - PSA test instrument



True or false?

- Most men with high PSA have prostate cancer
- Most men with prostate cancer have a high PSA

Anatomy



Glands

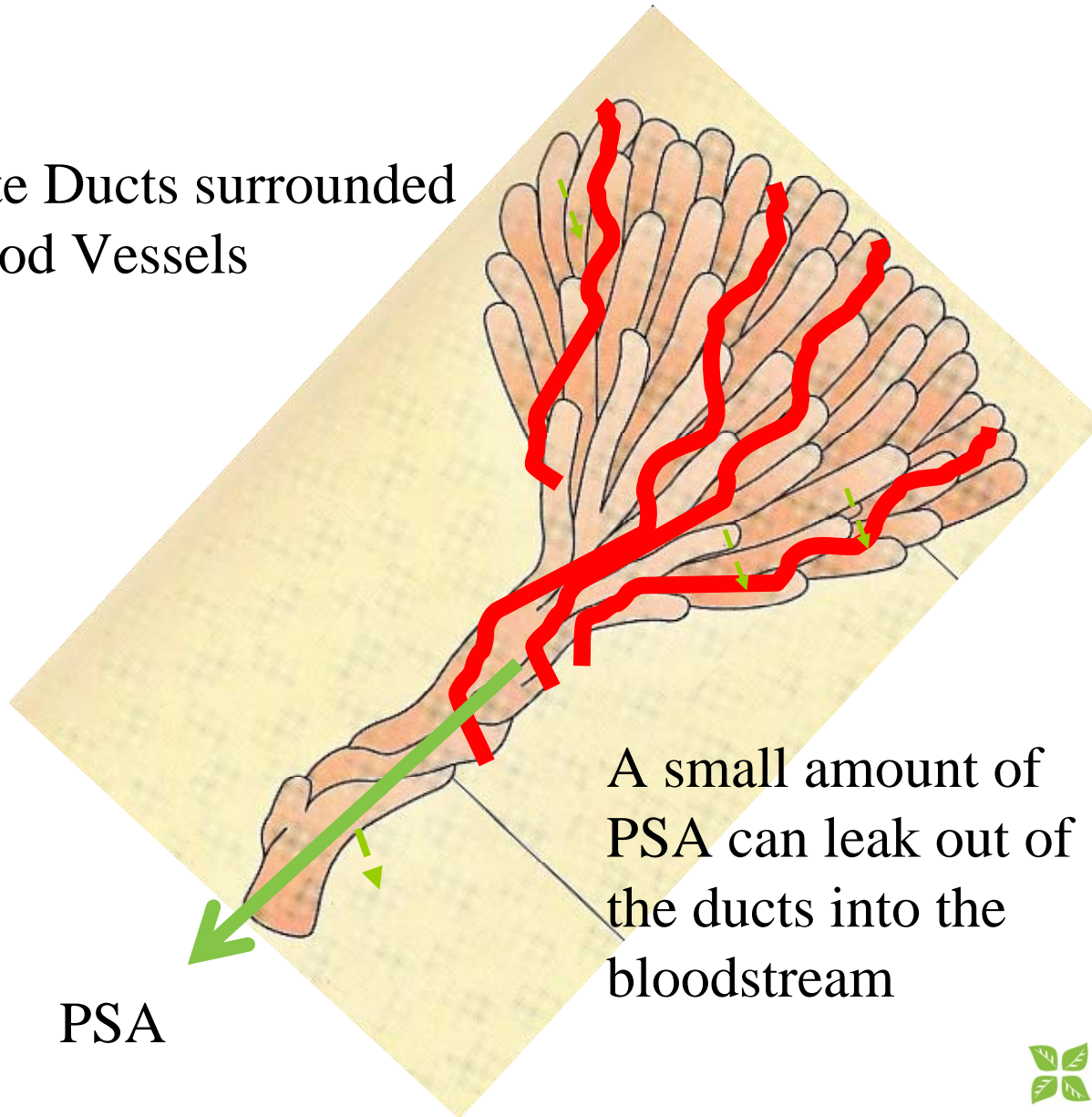
Ducts

Function:

Produces Semen

Bladder Control

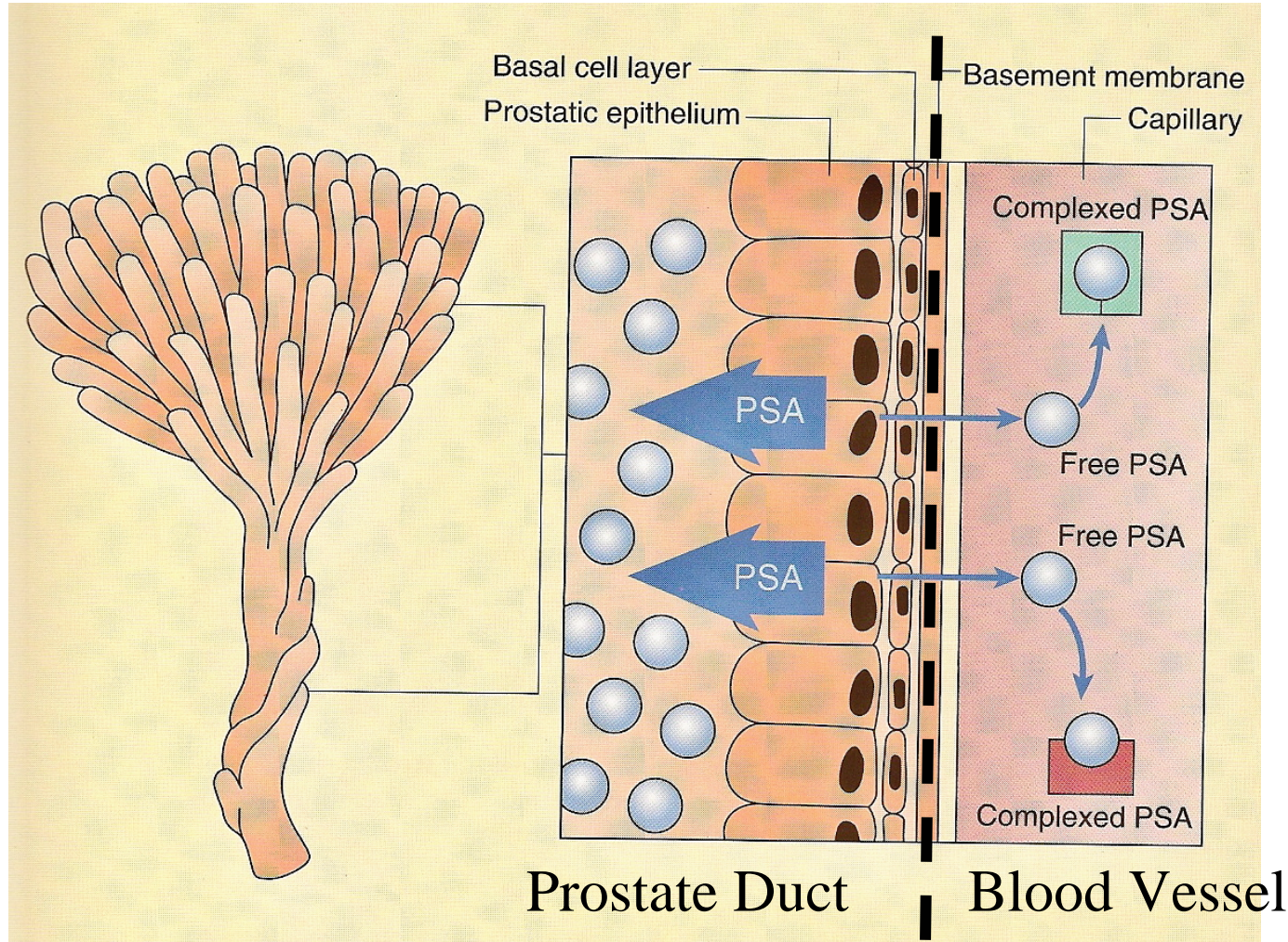
Prostate Ducts surrounded by Blood Vessels



A small amount of PSA can leak out of the ducts into the bloodstream

PSA

PSA and the Prostate



1,000,000 x higher



Causes of Leaks:

Inflammation

Trauma

BPH

Age

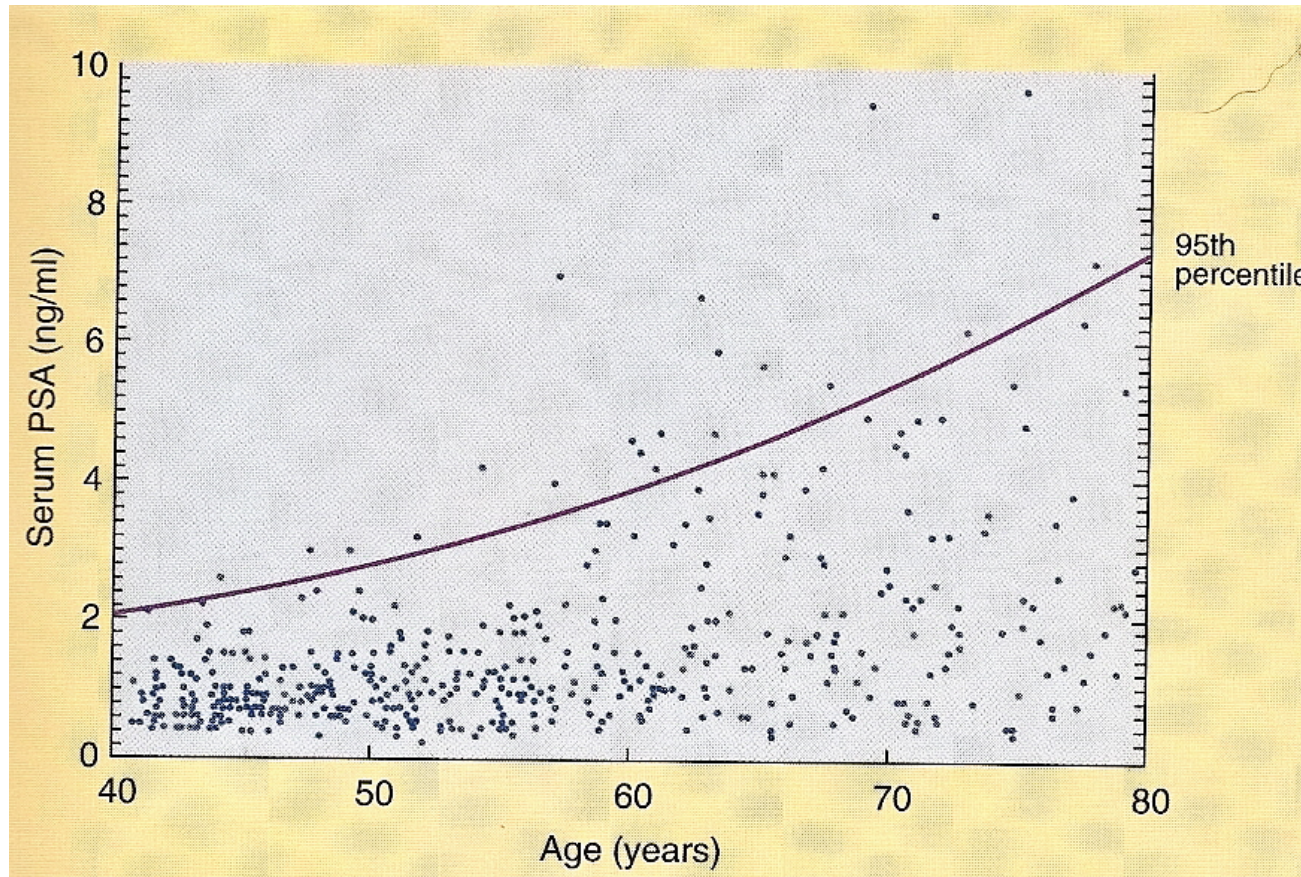
Cancer

Role of PSA testing

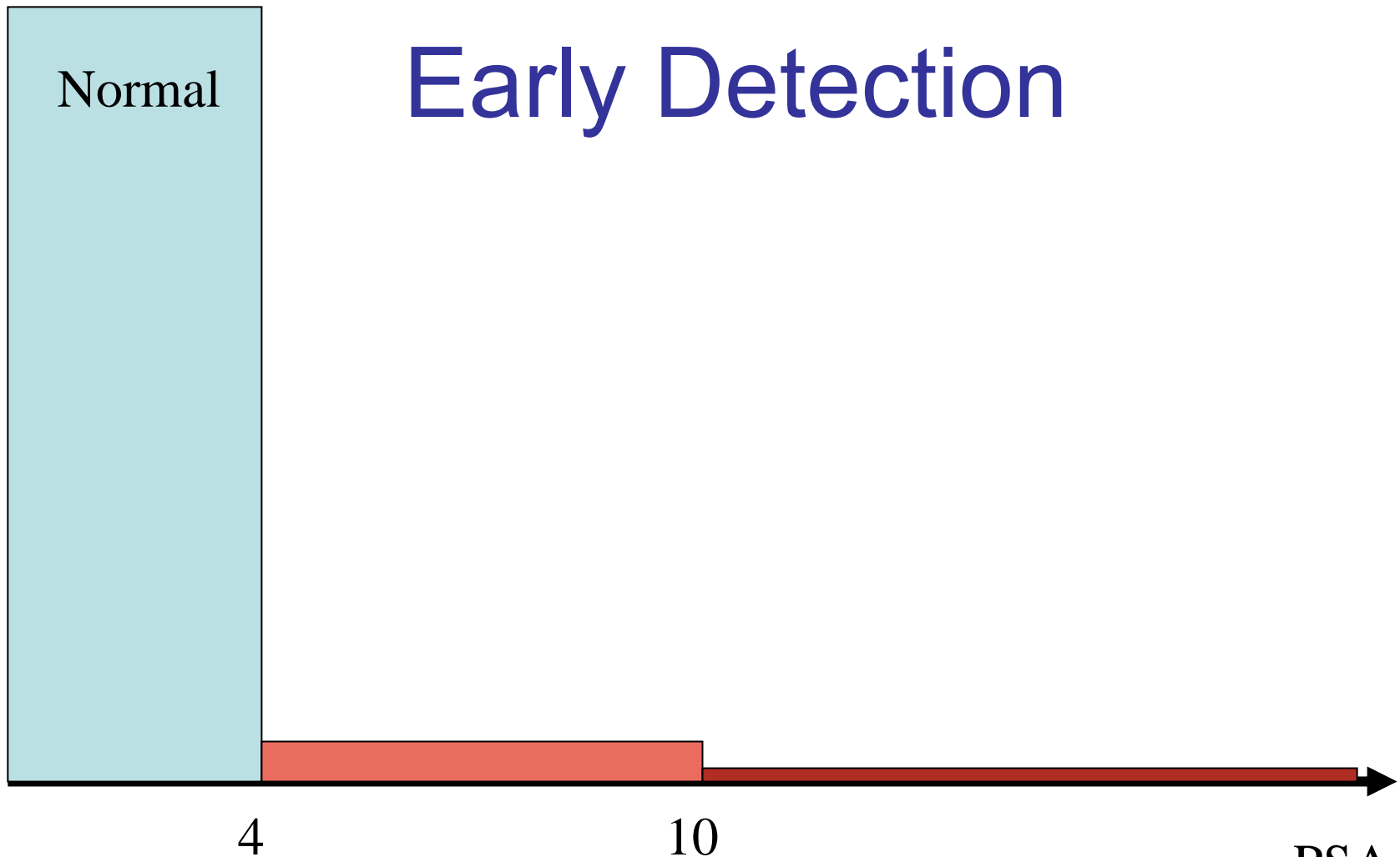


- Early Detection of Prostate Cancer
- Prognosis: predicting outcome of treatment
- Monitoring cancer
- Response to treatment

What is Normal PSA Level?



Early Detection



PSA Distribution in screened men aged 50-70 yrs

PSA

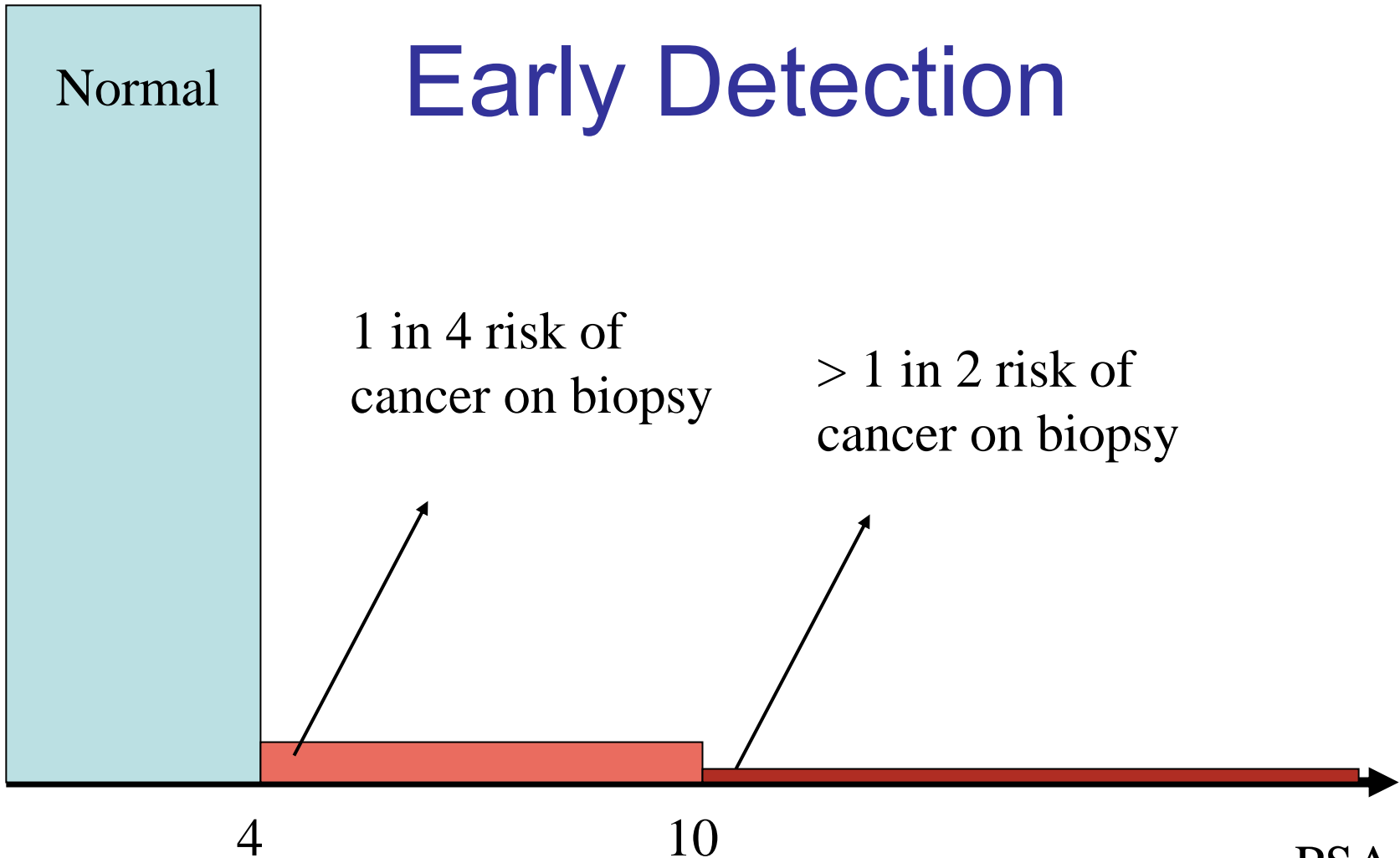
Level

 **Sunnybrook**

ODETTE CANCER CENTRE

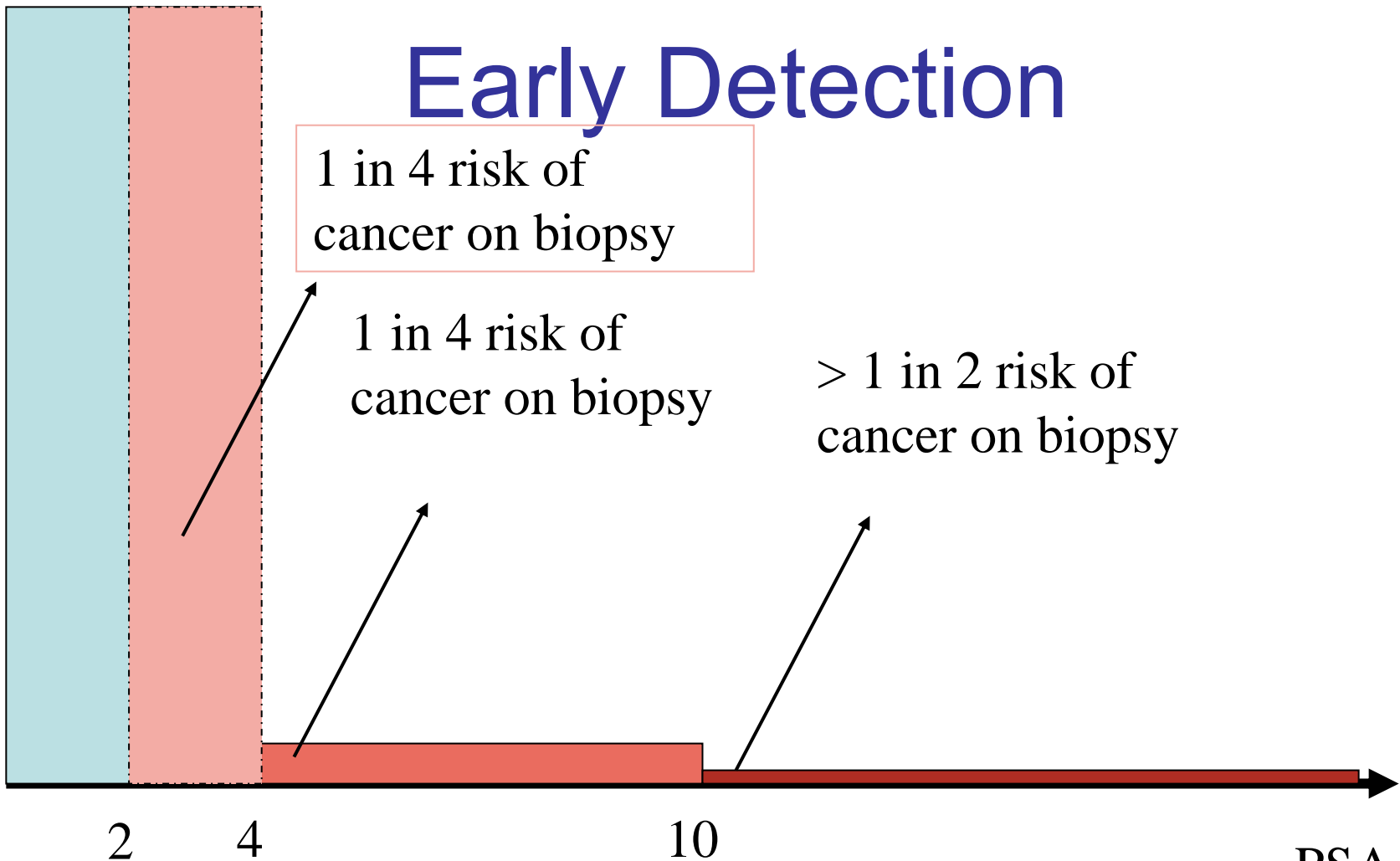
A Cancer Care Ontario Partner

Early Detection



PSA Distribution in screened men aged 50-70 yrs

Early Detection



PSA Distribution in screened men aged 50-70 yrs

PSA

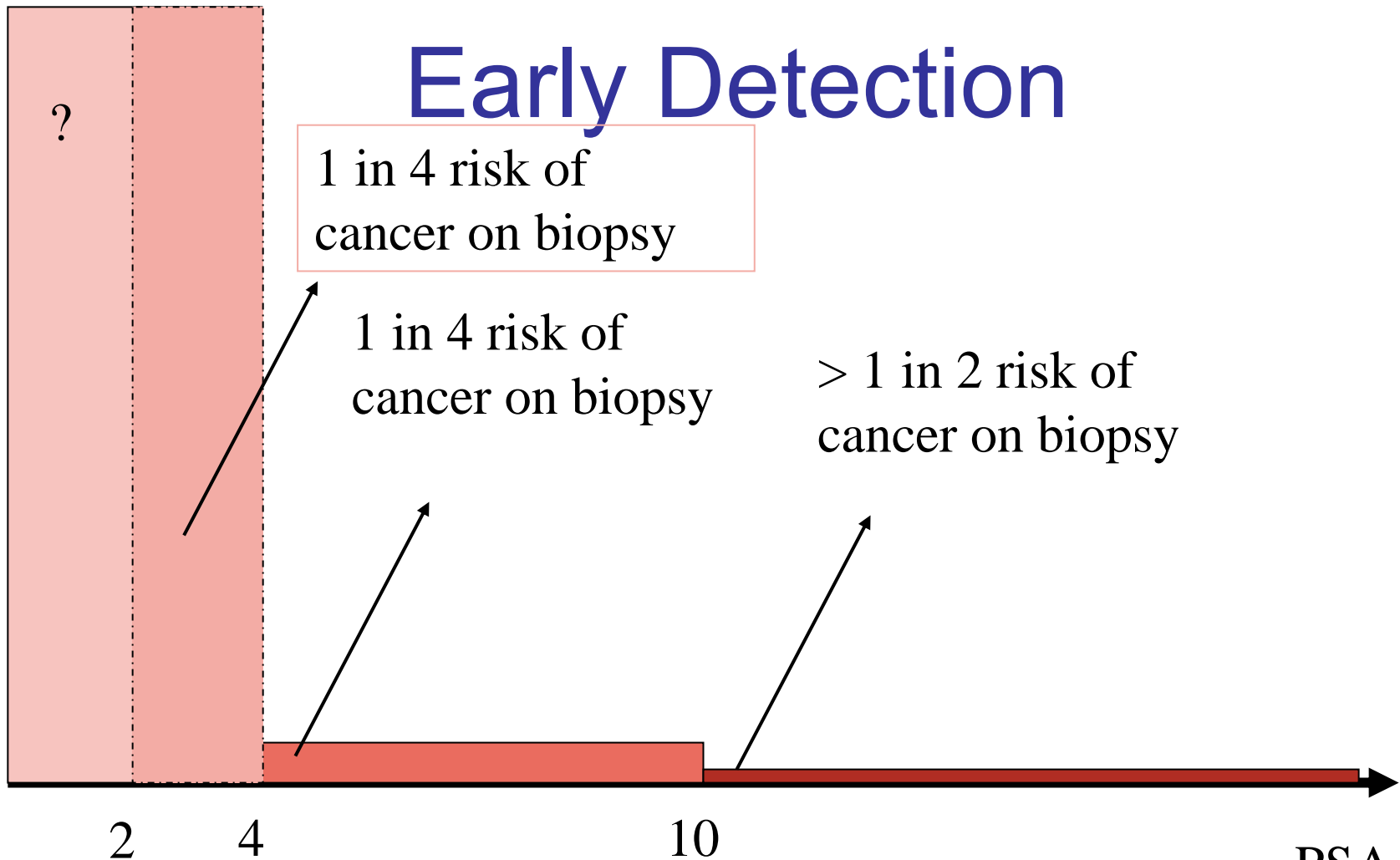
Level

 Sunnybrook

ODETTE CANCER CENTRE

A Cancer Care Ontario Partner

Early Detection



PSA Distribution in screened men aged 50-70 yrs

PSA

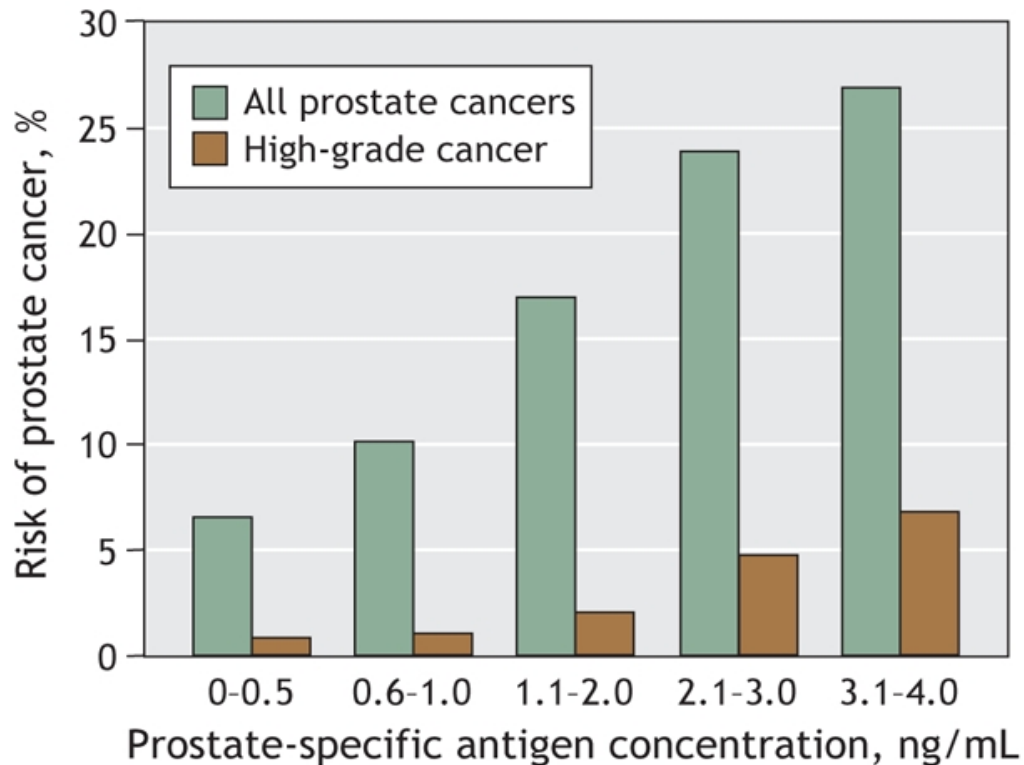
Level

 Sunnybrook

ODETTE CANCER CENTRE

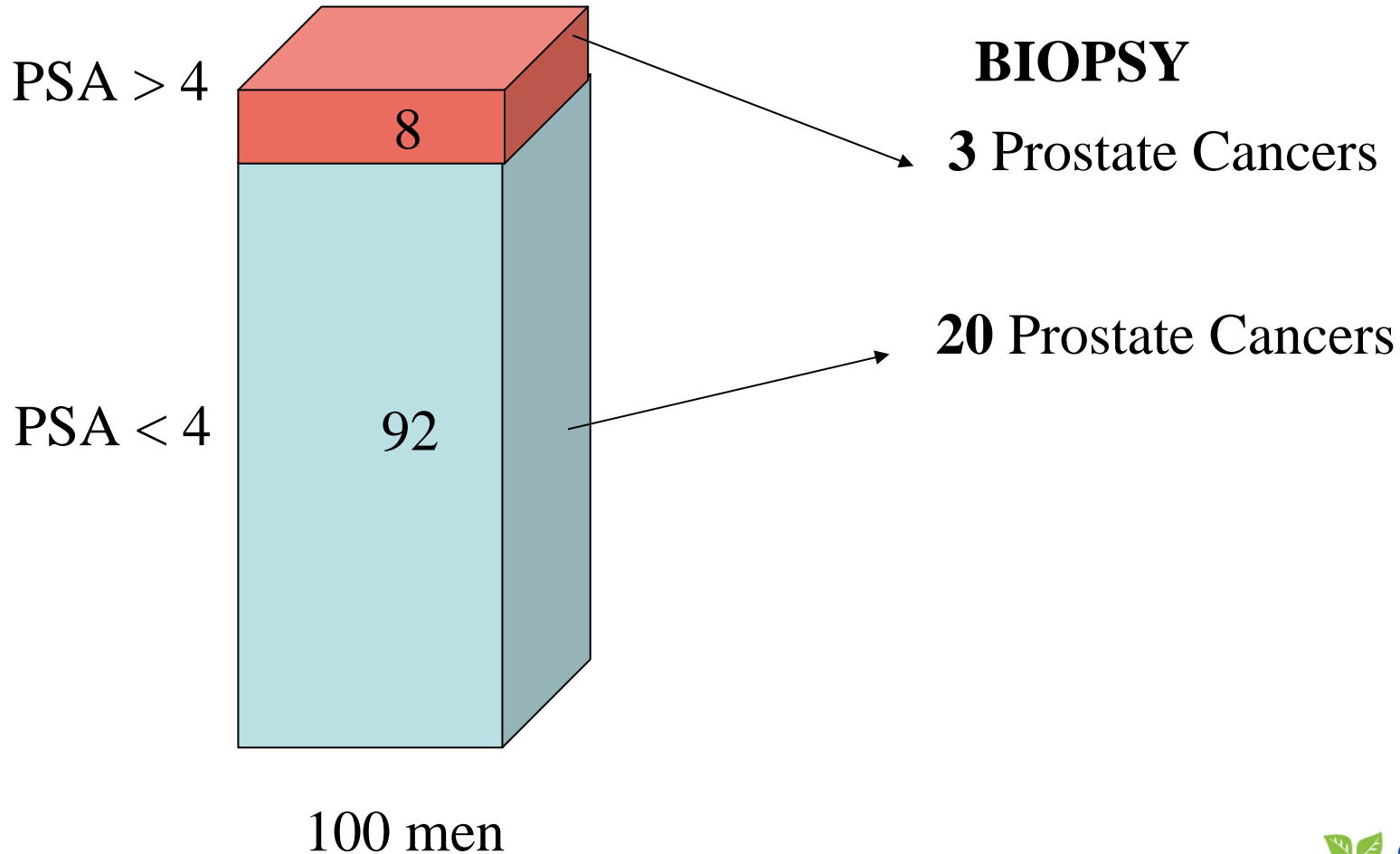
A Cancer Care Ontario Partner

Chance of finding cancer on biopsy with low PSA



Men with PSA < 2 ng/ml have a **10-15%** risk of having prostate cancer on biopsy

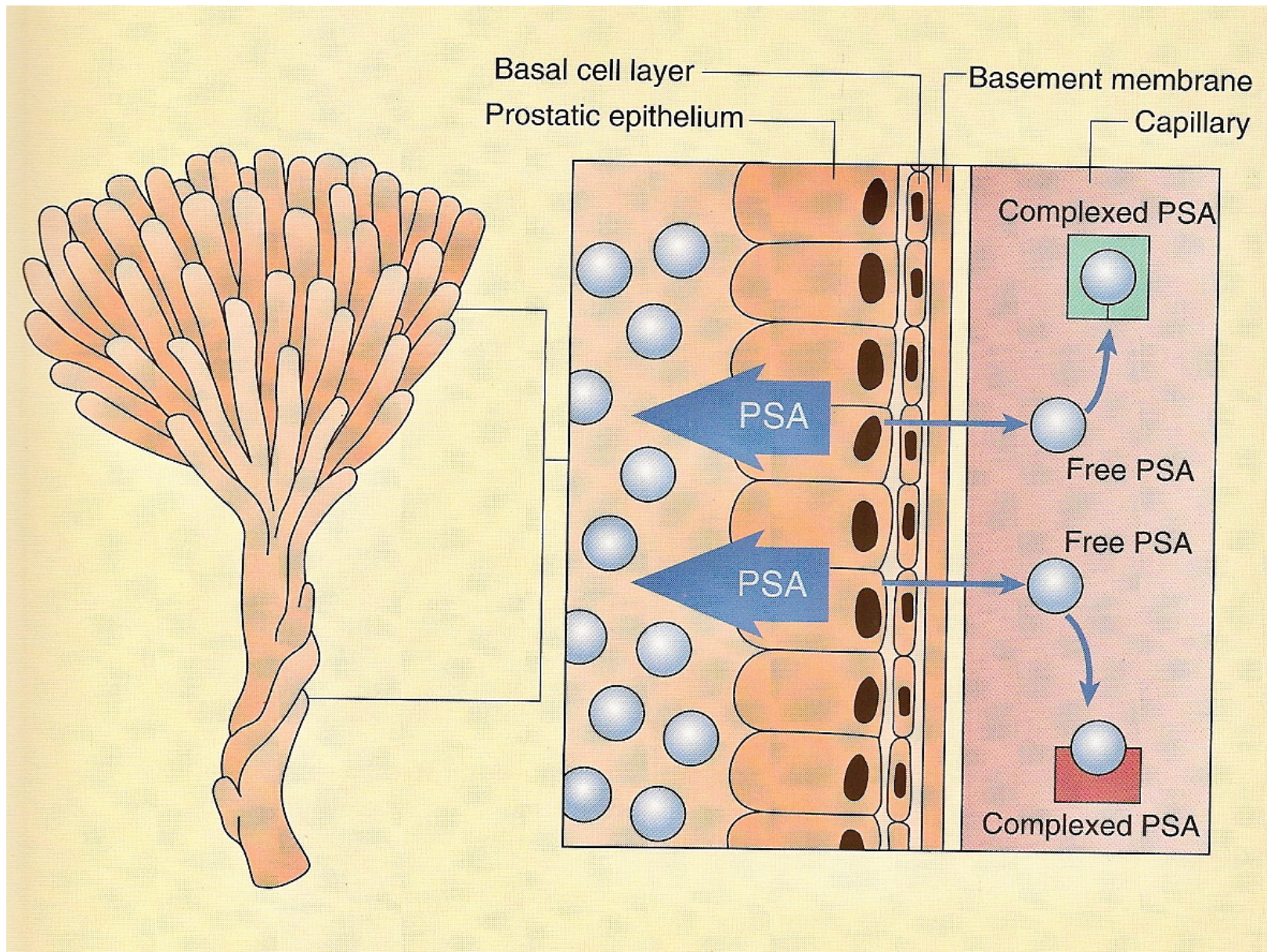
PSA for Early Detection



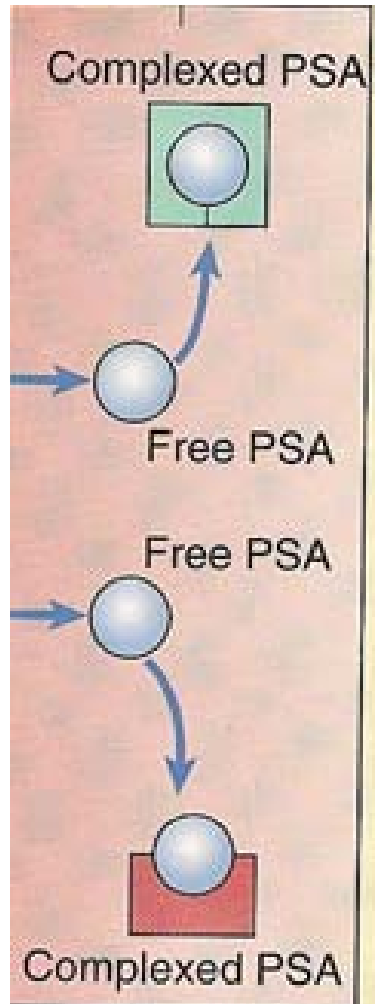
PSA and Prostate Cancer

- Most men with prostate cancer have a normal PSA level
- Most men with an elevated PSA level do not have cancer

PSA \neq CANCER

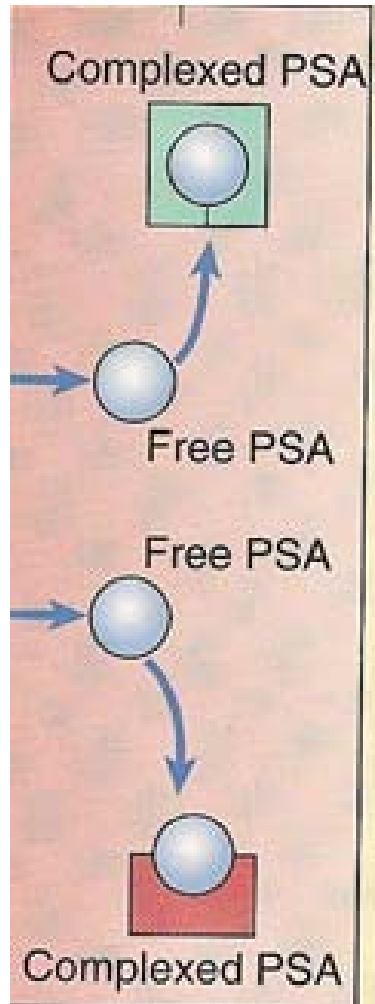


Free PSA



- Most PSA in the bloodstream binds to proteins (Complexed PSA)
- Some, around 15% remains “Free”
- Prostate cancer produces less “Free” than normal
- In the presence of cancer, the Free/Total Ratio often goes down

Free PSA



- Free/Total Ratio < 10%:
50% will have cancer on biopsy
- Free/Total Ratio > .20%:
10% will have cancer on biopsy

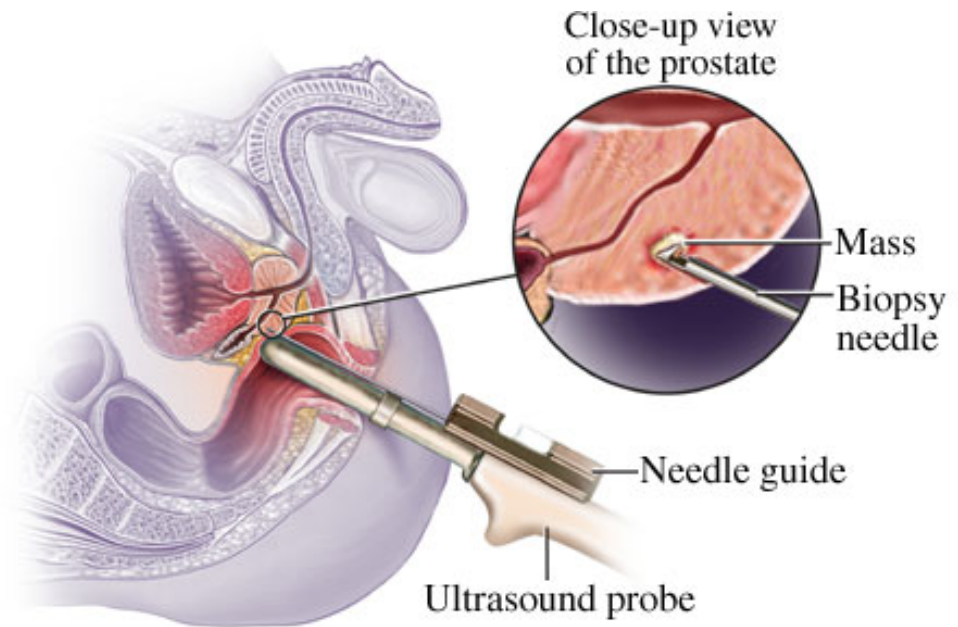
Uses for PSA



- Early detection/screening
- Prognosis
- Monitoring
- Response to treatment

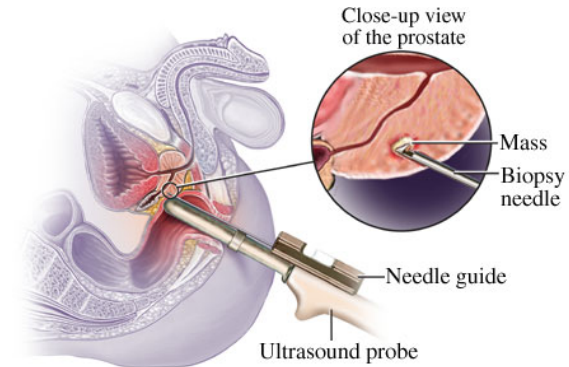
Early Detection of Prostate Cancer

- Early prostate cancer can be cured
- PSA *on its own* is not good for early detection
- Prostate Biopsy the only way to detect prostate cancer



How do we know who to biopsy?

- PSA Level
- Free/Total Ratio
 - Age
 - Race
- Family History
- Symptoms
- DRE Findings



Welcome



Welcome to ProstateRisk.ca. This extension of Sunnybrook.ca is focused on improving methods for prostate cancer detection and is an integral part of a multi-institutional prospective study to evaluate factors related to prostate cancer risk. This study is generously funded by the National Cancer Institute of Canada and the Canadian Cancer Society. Our joint primary interest is to improve methods for prostate cancer prevention, detection and treatment.



Dr. Robert Nam is the principal investigator for this study. He is a urologic oncologist at Sunnybrook Health Sciences Centre, University of Toronto. His research interests include prostate cancer risk assessment, new biomarker discovery and the genetics of prostate cancer. He has assembled a cross-Canada team to evaluate a clinical prediction tool, termed a [nomogram](#), to evaluate prostate cancer risk. Researchers from the University of British Columbia, University of Western Ontario, McGill University and Dalhousie University will be collaborating to evaluate this tool. A nomogram is a statistical model to determine risk for disease based on risk factors using a table and chart format.

This nomogram called the [Sunnybrook Prostate Cancer Risk Calculator](#) is available to you, the general public so that in consultation with your primary care physician, you can better evaluate and manage your individual risk for prostate cancer.

Contact Information:

Sunnybrook Health Sciences
Centre
2075 Bayview Ave, MG - 406
Toronto, On, M4N 3M5

Telephone:
416-480-6100 Ext.7504
(Research Assistant, Urology)

TRY THE PROSTATE
RISK CALCULATOR



RESEARCHER
LOGIN

Prostate Risk Calculator

Sunnybrook Prostate Cancer Risk Calculator

This tool is part of a project being conducted across Canada to better understand predictive factors for prostate cancer. Your participation in this project will not only alert you to any potential risk, but will help researchers further refine the detection process.

This particular nomogram is the first to use all known risk factors to help primary care physicians predict individual prostate cancer risk, including patients with normal Prostate Specific Antigen (PSA) levels at high risk, and has been shown to perform better than conventional screening with PSA and Digital Rectal Exam (DRE) alone.

* All fields are required to calculate risk.

Age: range (30 - 90)
IPSS(Urinary voiding Symptom score): range (0 - 35)
PSA: range (0.1 - 50)
FTPSA (Free:total PSA ratio): range(0.01 - .99)
Ethnic Background: Asian Caucasian African Desent Other
Family history of prostate cancer: Yes No
Abnormal DRE(by Doctor): Yes No

Please read the [disclaimer](#) before Calculating.

I have read the disclaimer.

Evaluate Prostate Cancer Risk

Prostate Risk Calculator

Sunnybrook Prostate Cancer Risk Calculator

This tool is part of a project being conducted across Canada to better understand predictive factors for prostate cancer. Your participation in this project will not only alert you to any potential risk, but will help researchers further refine the detection process.

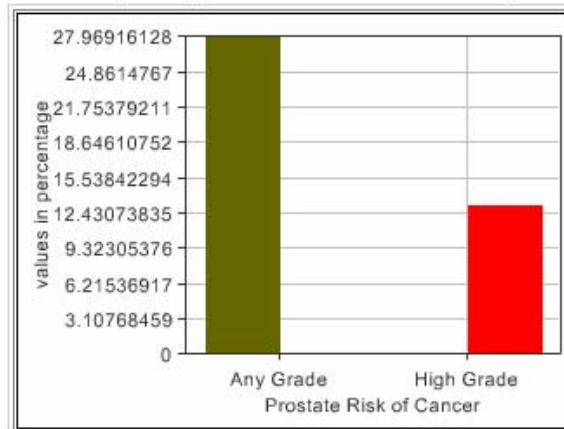
This particular nomogram is the first to use all known risk factors to help primary care physicians predict individual prostate cancer risk, including patients with normal Prostate Specific Antigen (PSA) levels at high risk, and has been shown to perform better than conventional screening with PSA and Digital Rectal Exam (DRE) alone.

Results

Age:	52
IPSS(Urinary voiding Symptom score):	2
PSA:	3.5
FTPSA (Free:total PSA ratio):	.15
Ethnic Background:	Caucasian
Family history of prostate cancer:	No
Abnormal DRE(by Doctor):	No

Probability Of Any Grade Cancer is: 28.0%

Probability Of High Grade Cancer is: 13.1% (Gleason Score 7 or more)



PSA and Prognosis



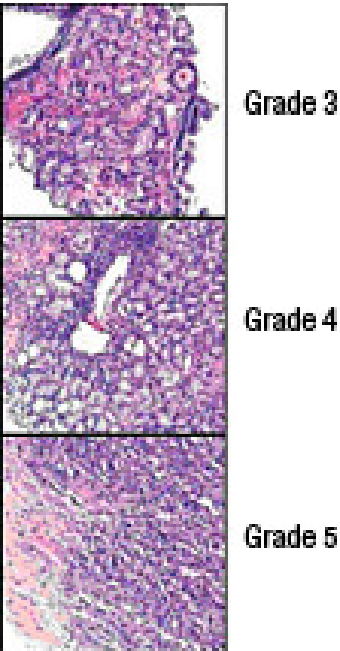
Low

Intermediate

High

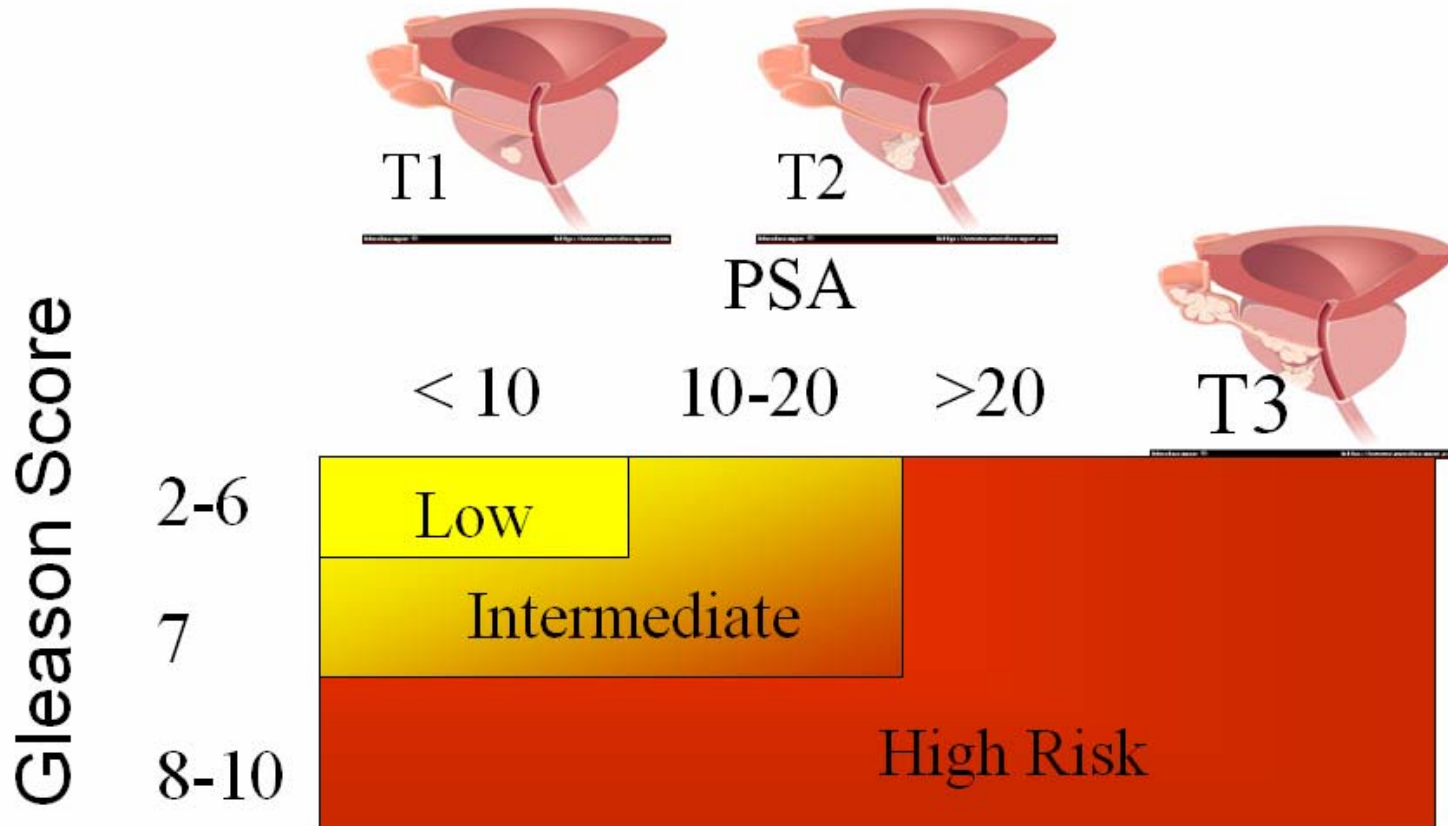
- Some cancers are less serious than others
- Can predict likely behaviour from:
 - Gleason Score
 - Level of PSA in the blood
 - DRE findings (Stage)

Gleason Score

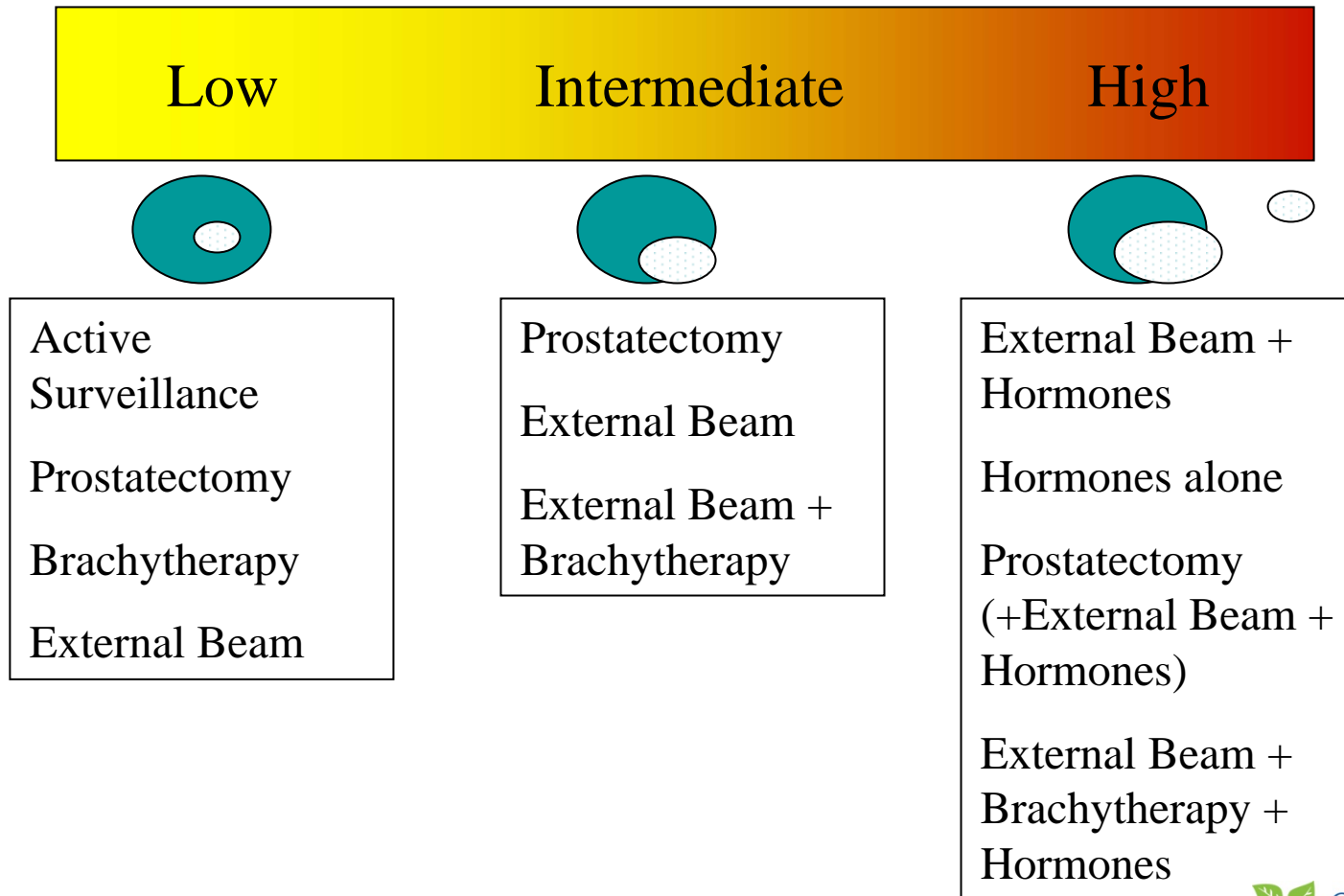


- How aggressive the cancer looks under the microscope
- 2 areas graded from 2-5 and added together.
- Total Gleason Score usually 6-10
 - 6 is good
 - 7 is intermediate
 - 8-10 is aggressive

Prognostic Groups



Prostate Cancer Treatment



Monitoring the cancer



- Active Surveillance an option for many
- Changes in PSA reflect changes in cancer
- Can calculate how quickly PSA is changing and what cancer is doing

Prostate Cancer Active Surveillance Program

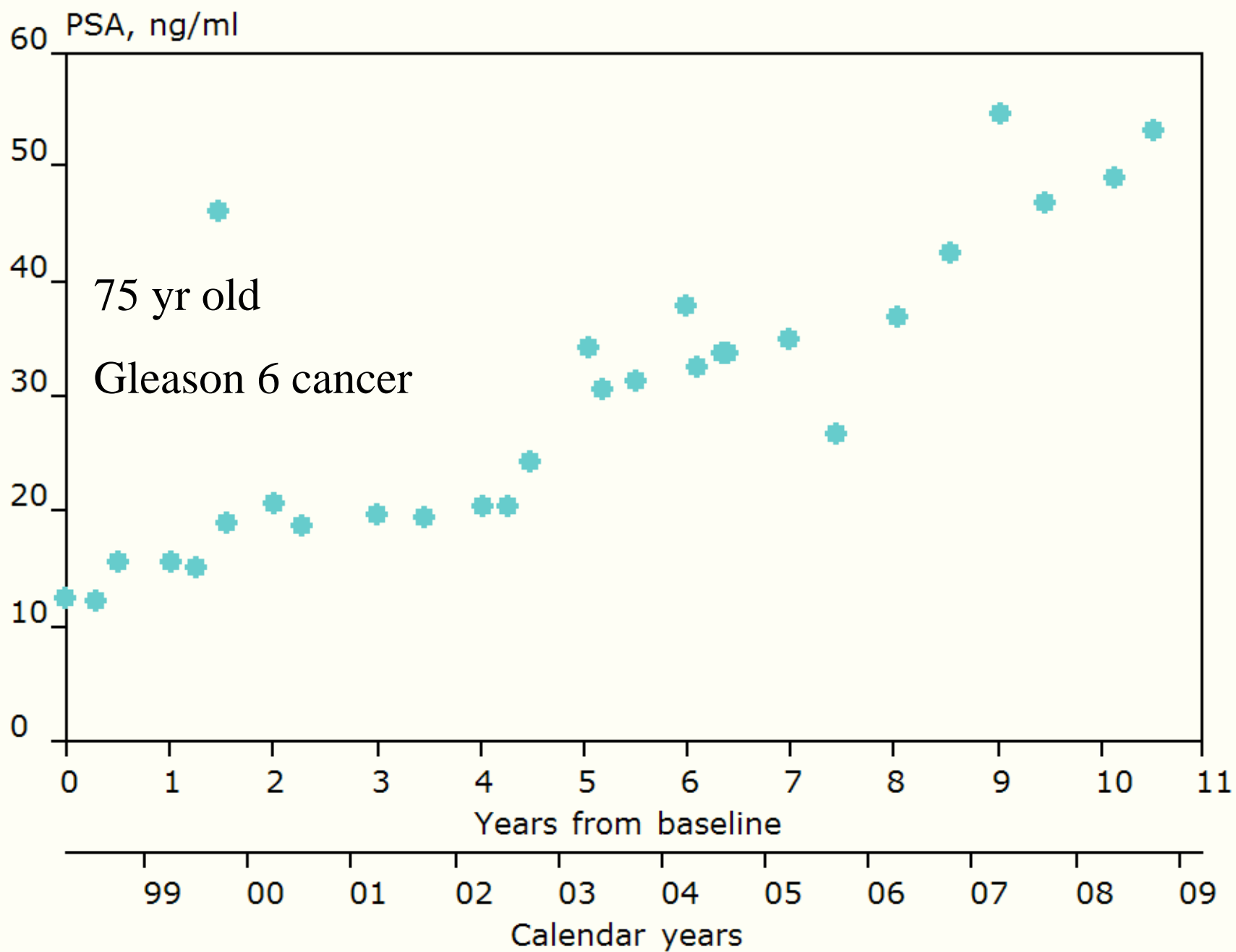
P.I.: Drs. Laurence Klotz and Andrew Loblaw

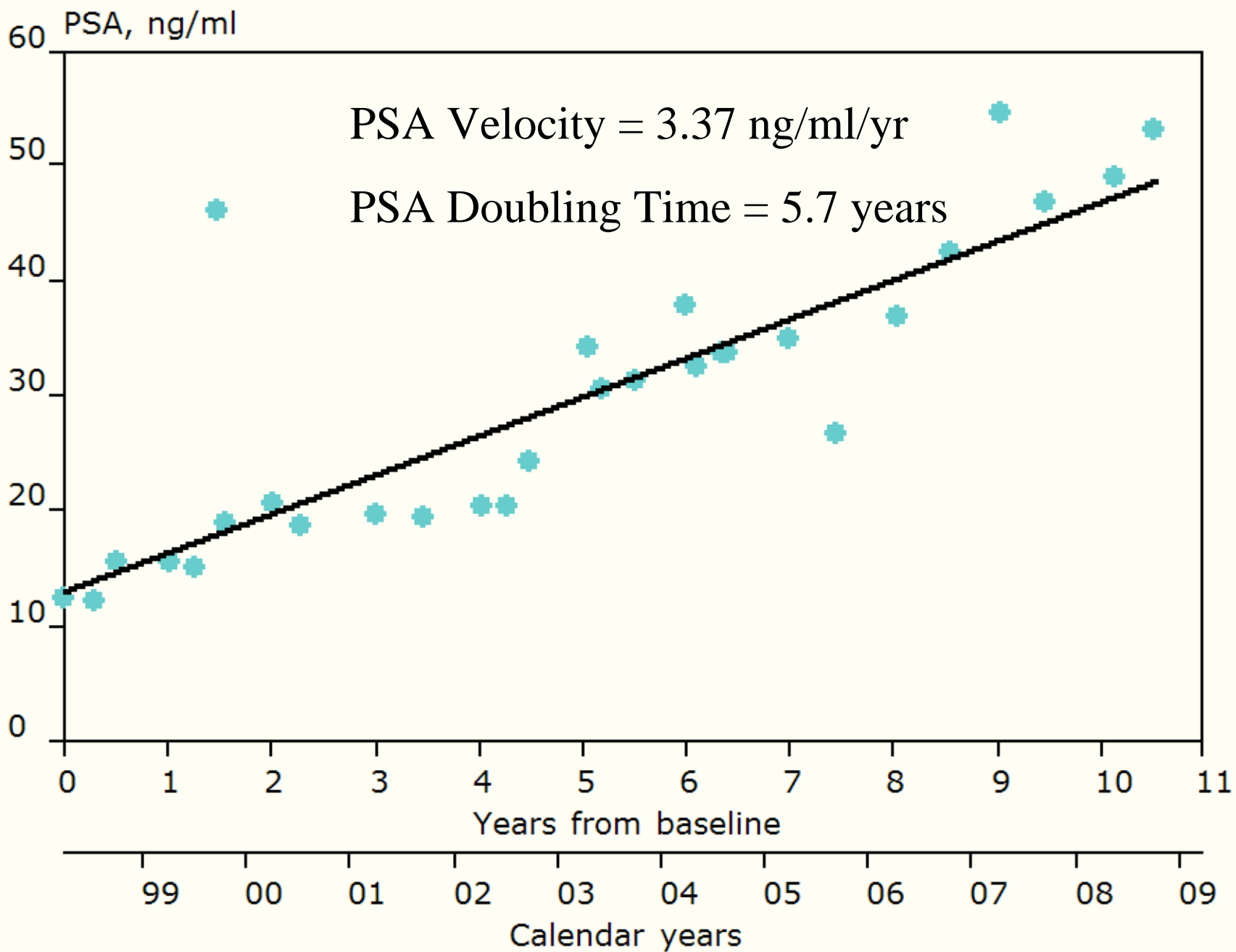
Biostatistician: Dr. Liying Zhang

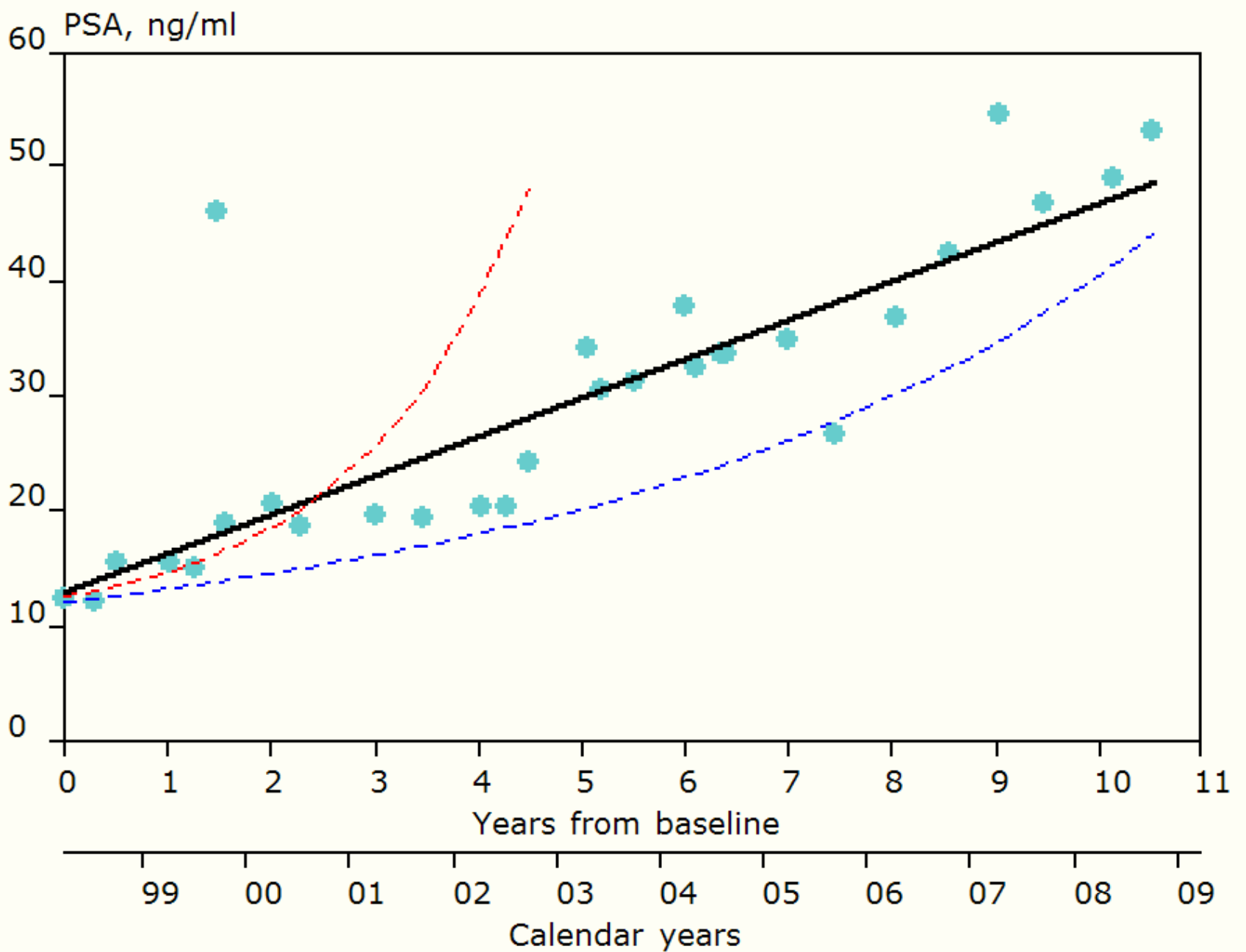
Webmaster/Programmer: Alexandre Mamedov

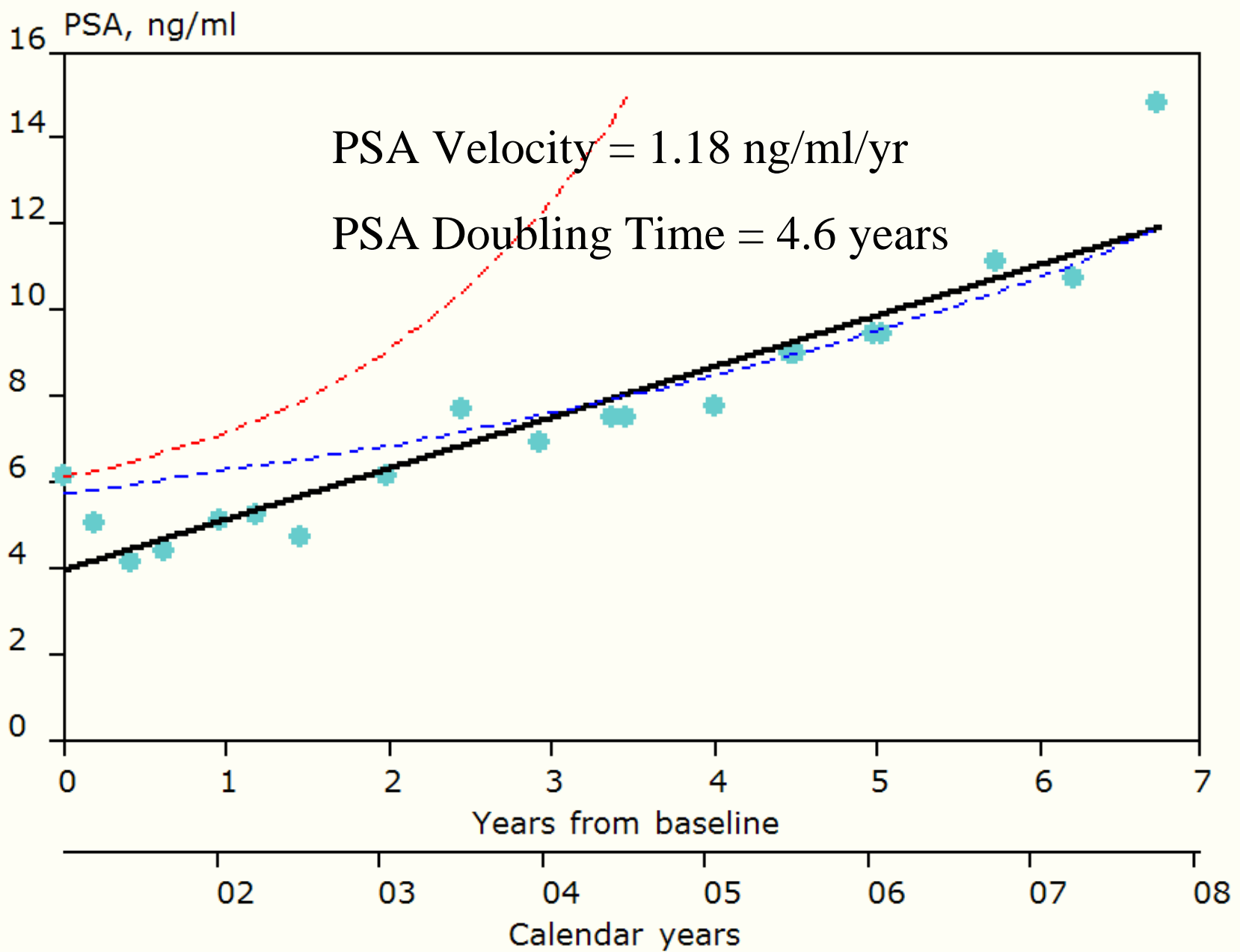
WELCOME TO THE SUNNYBROOK ACTIVE SURVEILLANCE PATIENT MANAGEMENT WEB SITE

Web-based Software Tool to Monitor PSA Changes



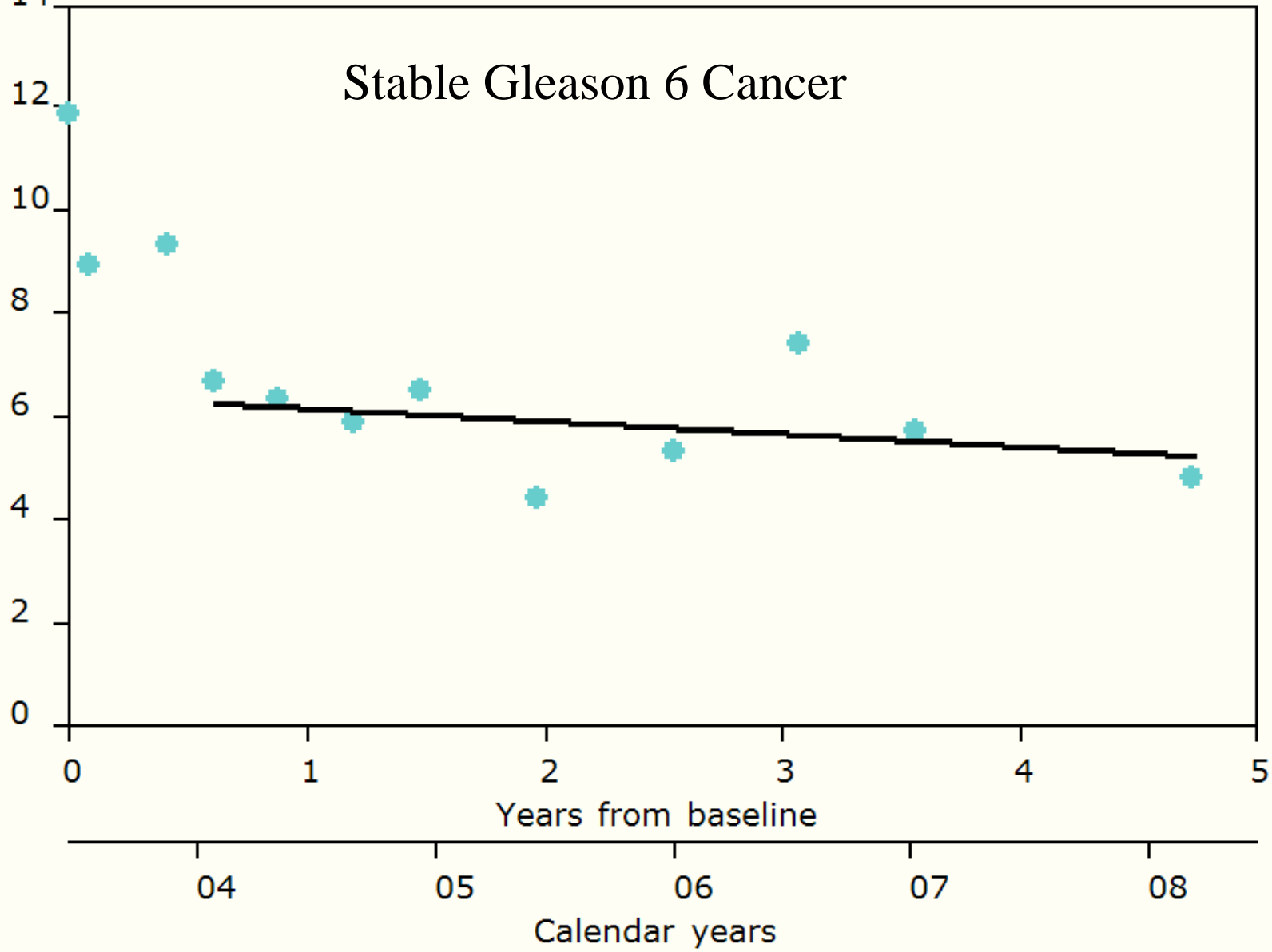




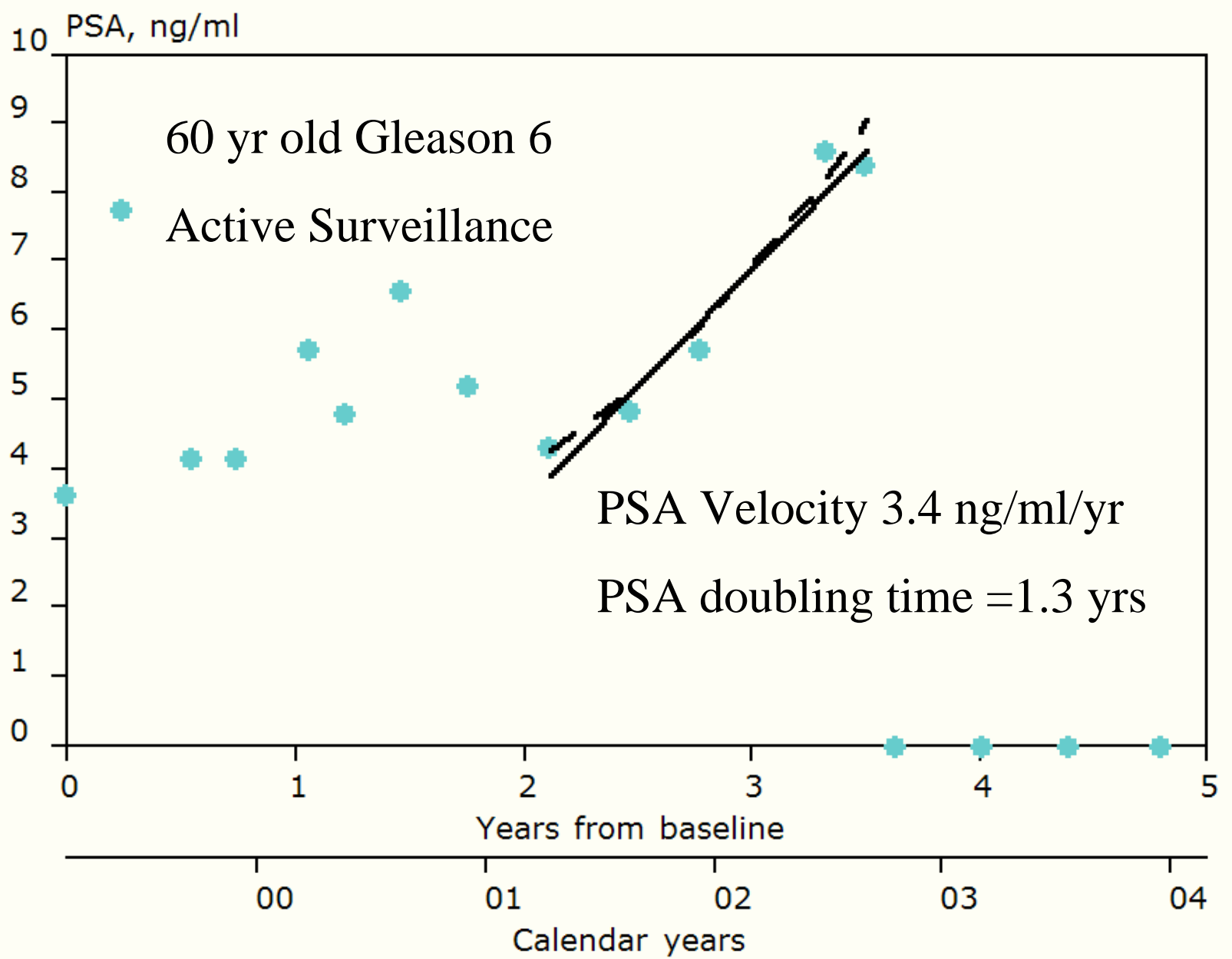


PSA, ng/ml

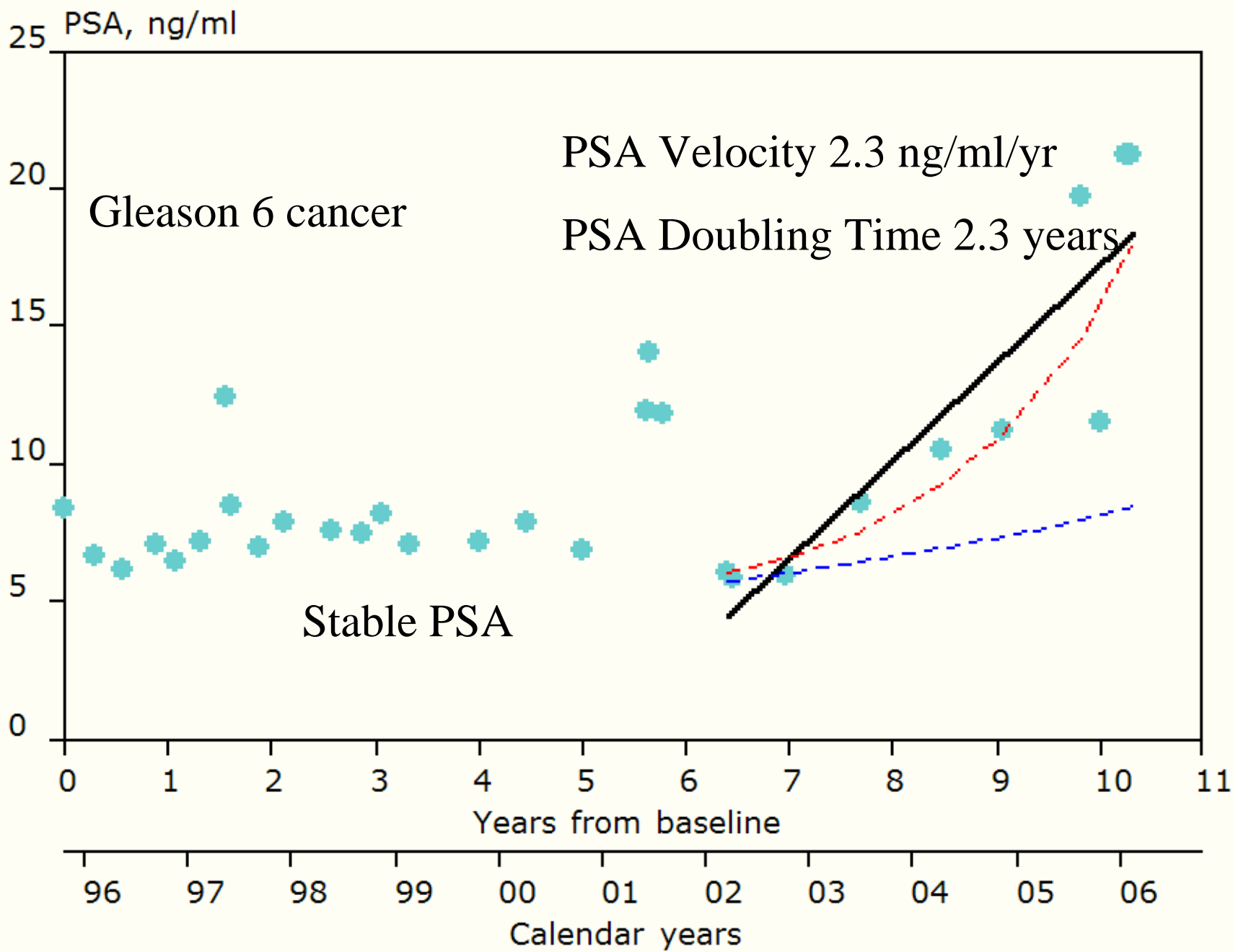
Stable Gleason 6 Cancer



↑
Avodart



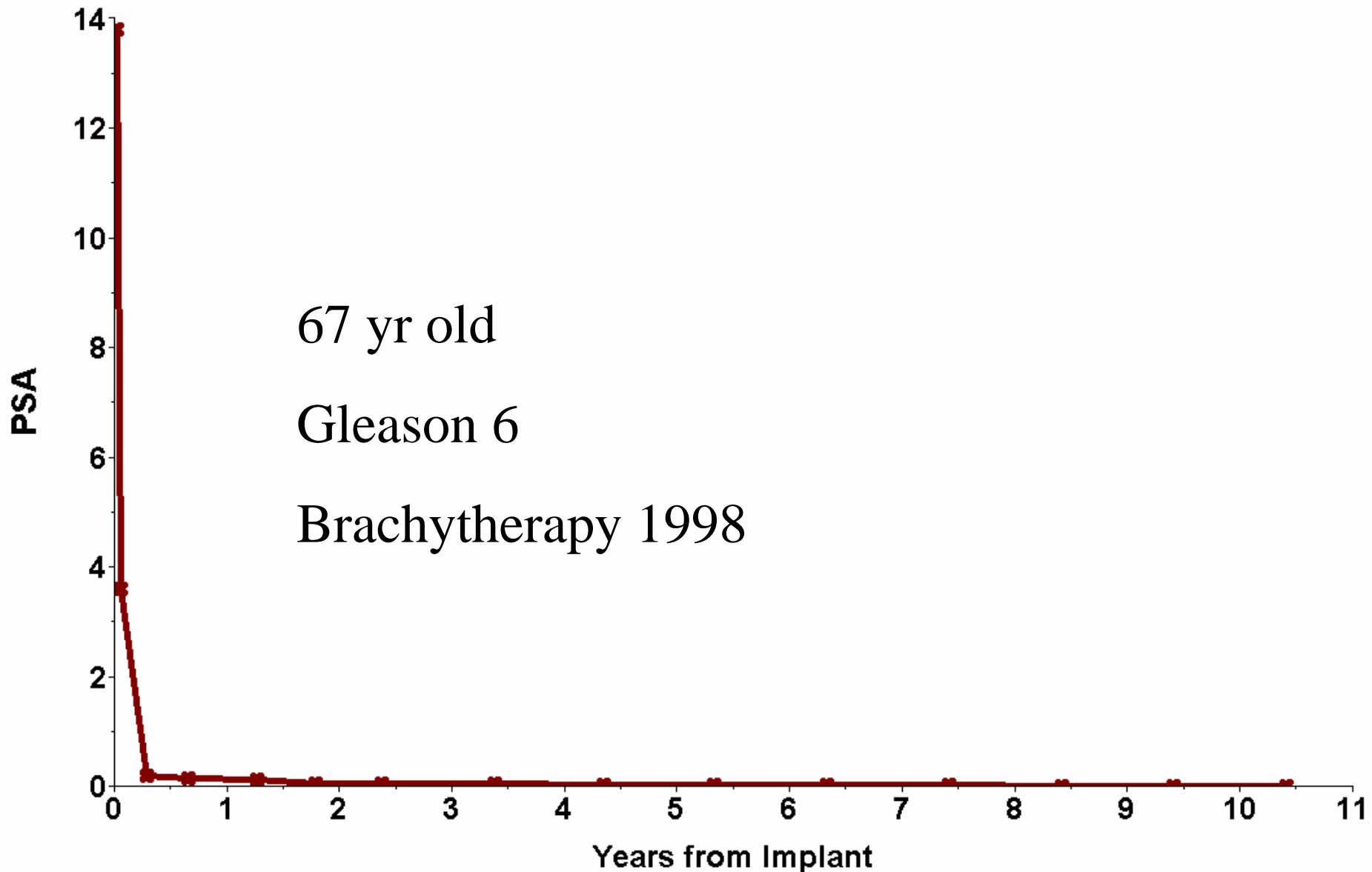
↑
RP

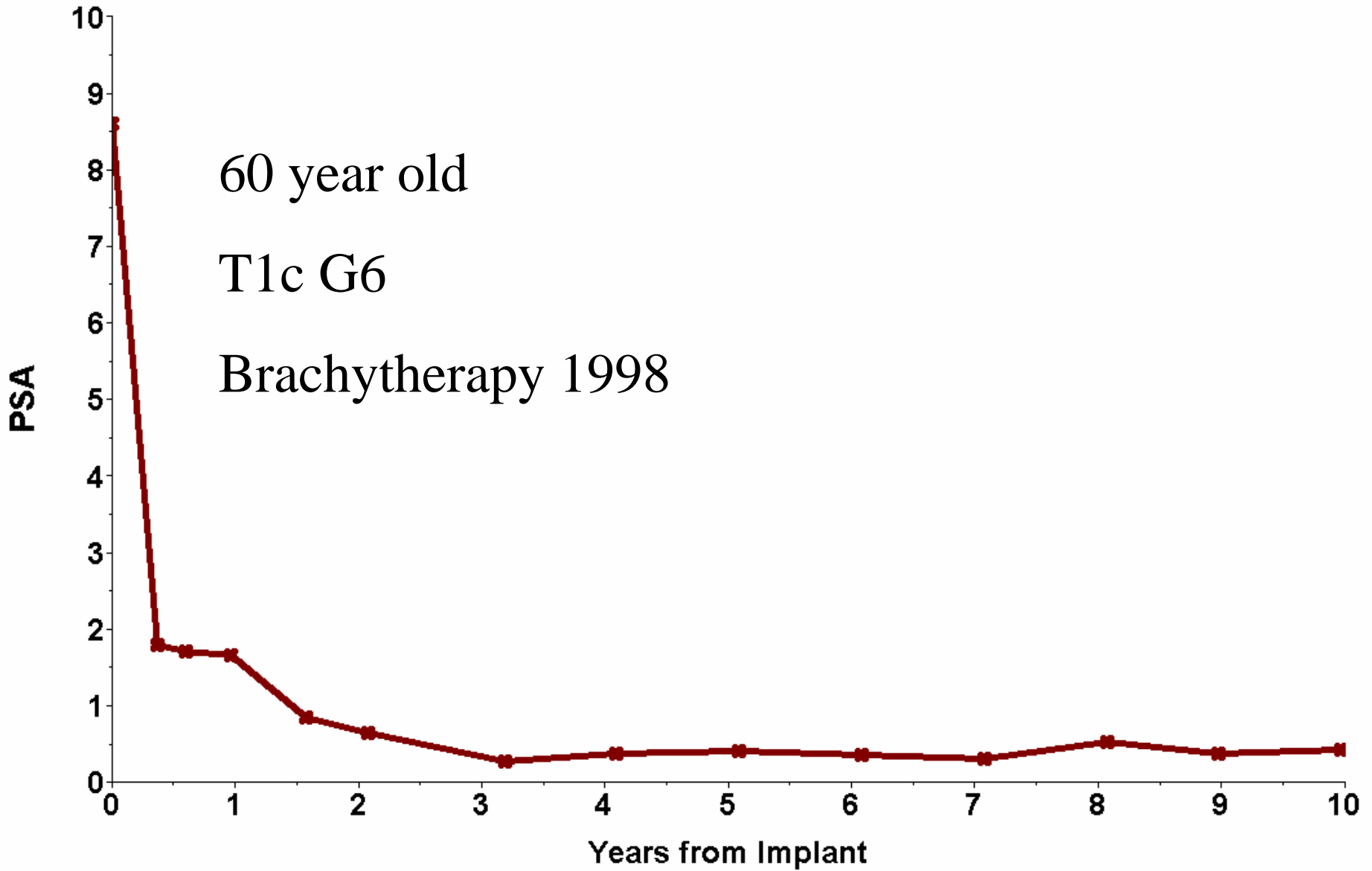


Response to Treatment



- After Radiotherapy PSA should fall to low value and stay there
- After Prostatectomy, PSA should be undetectable
- A rise in PSA after treatment is an early warning sign of future disease recurrence



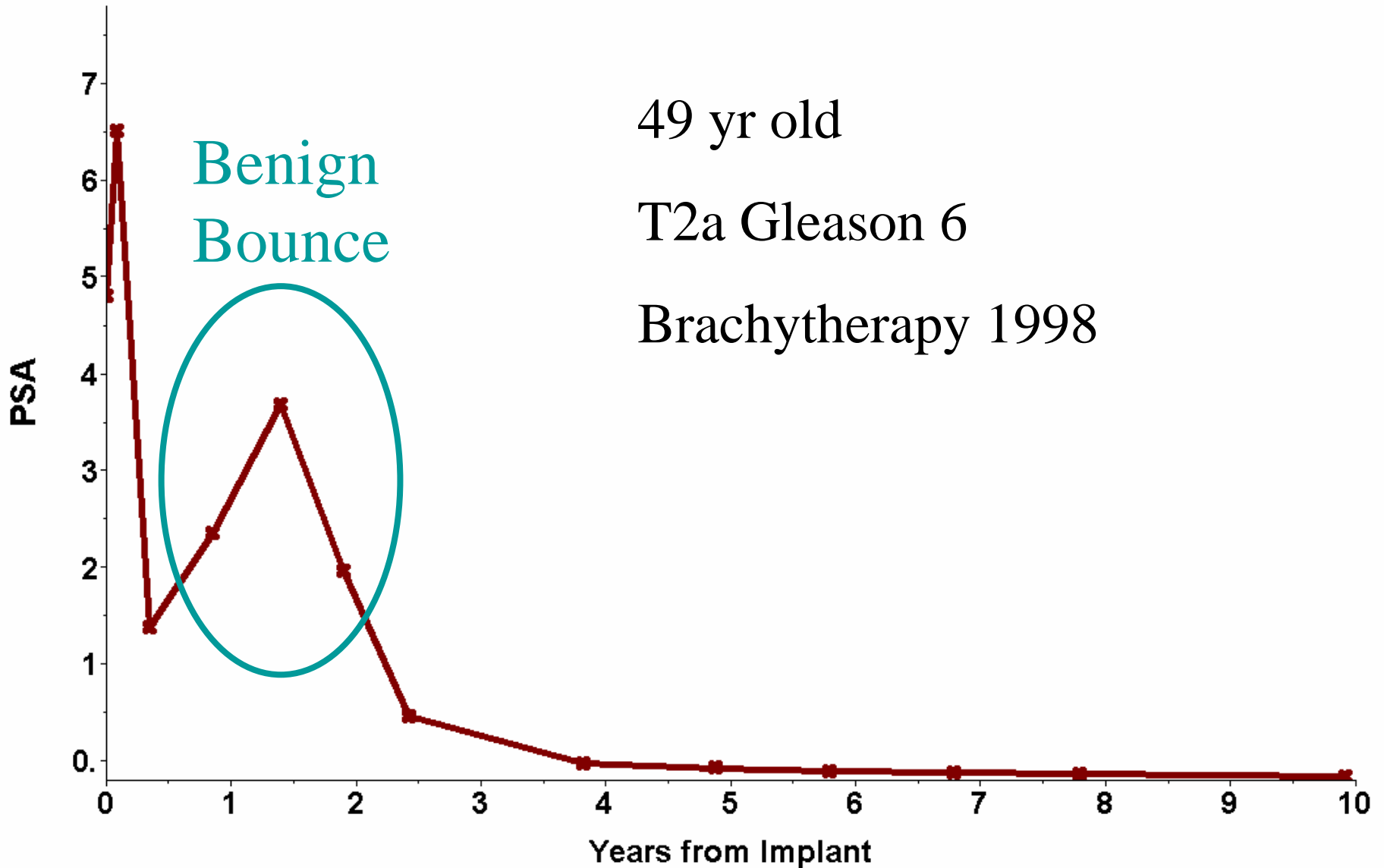


Benign
Bounce

49 yr old

T2a Gleason 6

Brachytherapy 1998

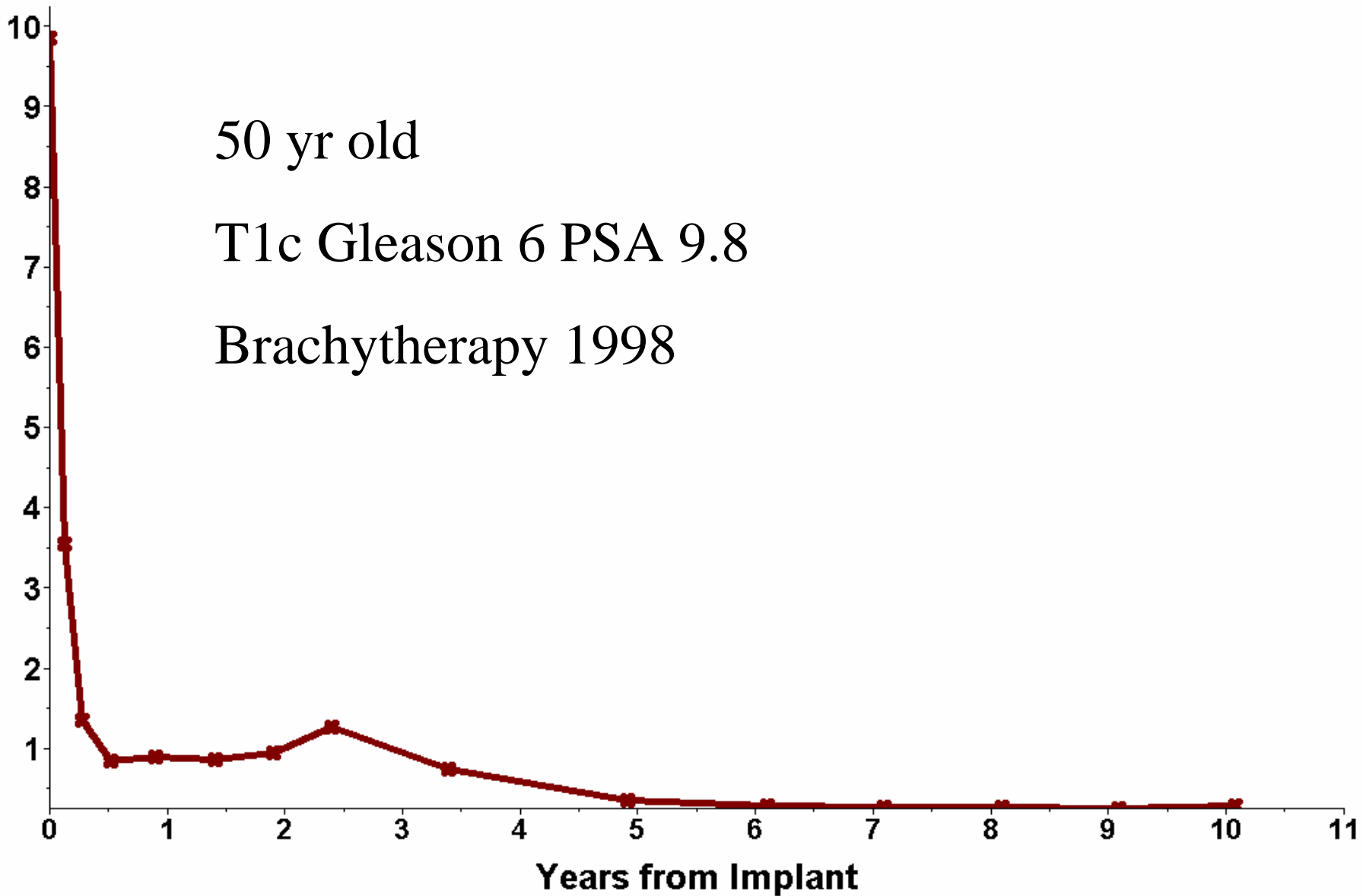


50 yr old

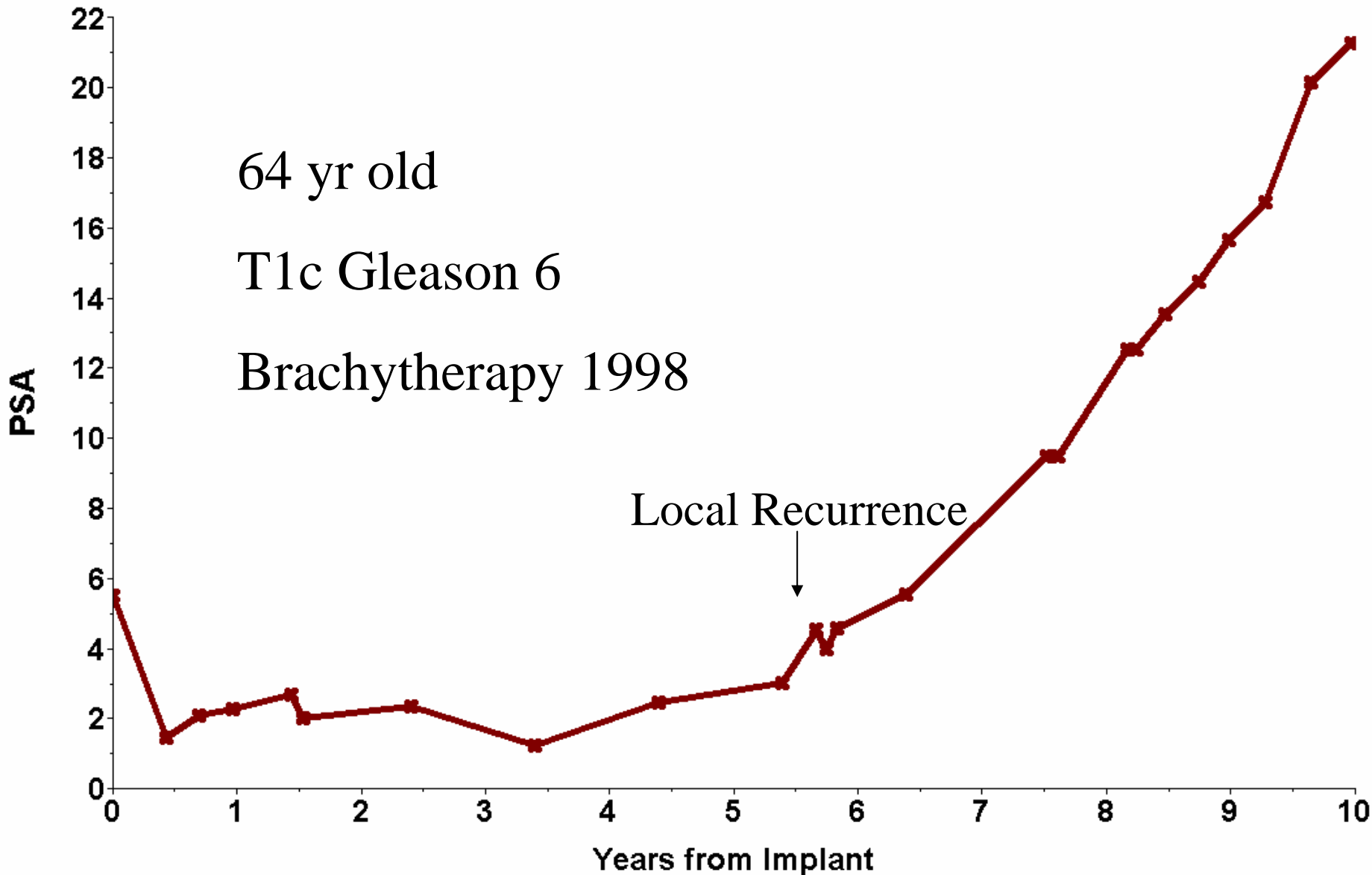
T1c Gleason 6 PSA 9.8

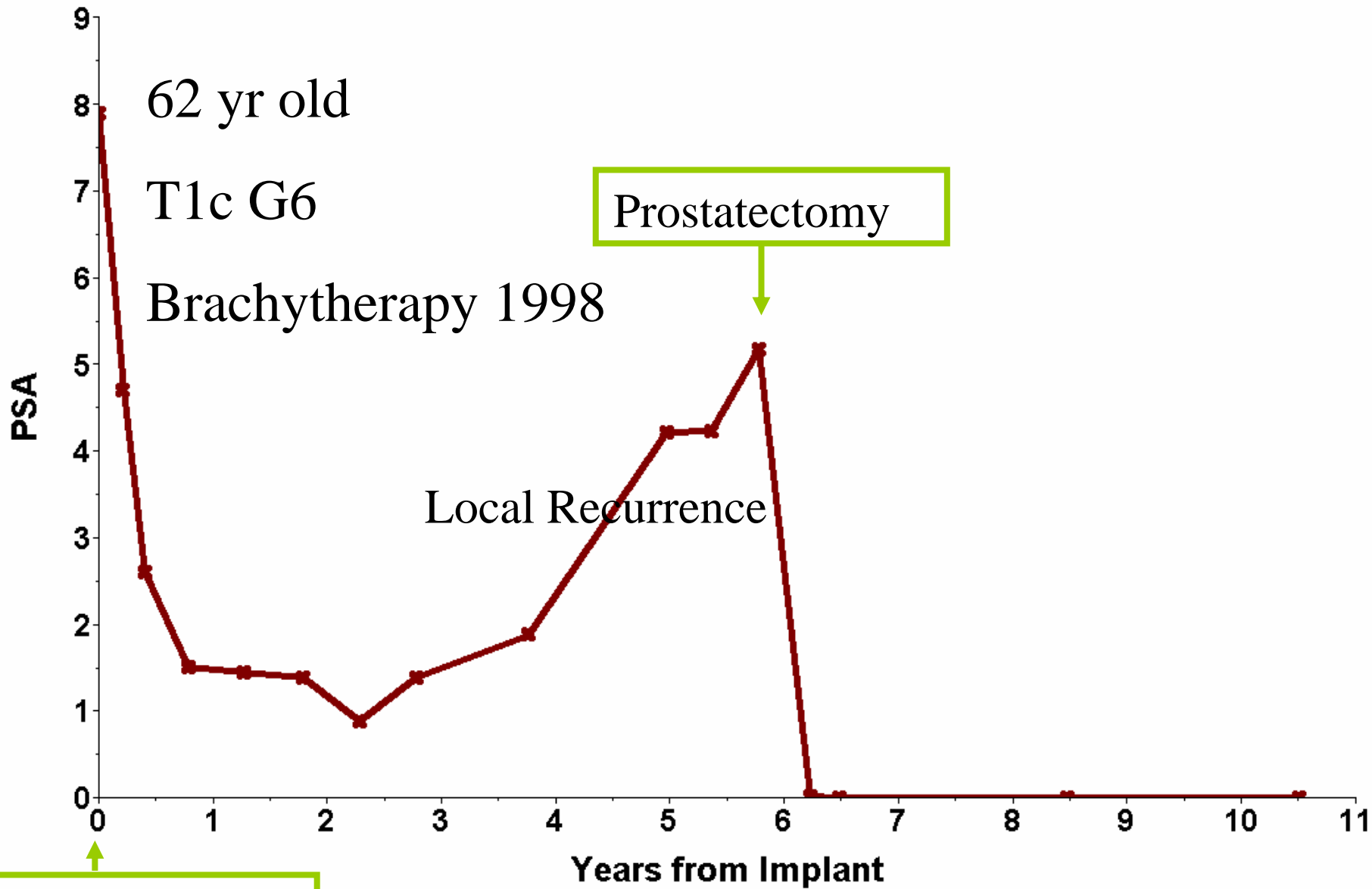
Brachytherapy 1998

PSA



64 yr old
T1c Gleason 6
Brachytherapy 1998





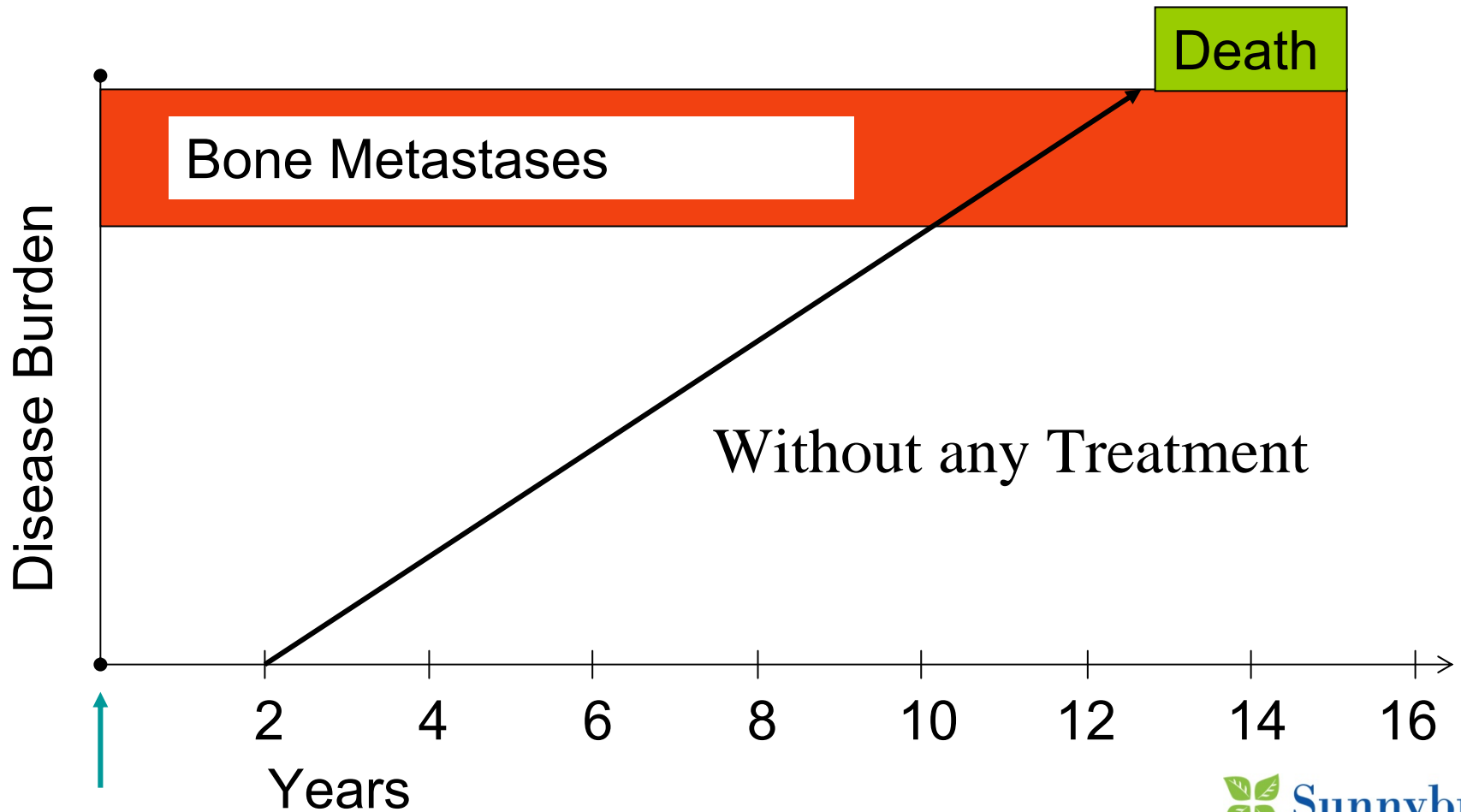
What should I do if my PSA is rising after surgery or radiotherapy?

- Don't panic
- Determine how quickly it's rising
- Decide if and when further treatment is needed

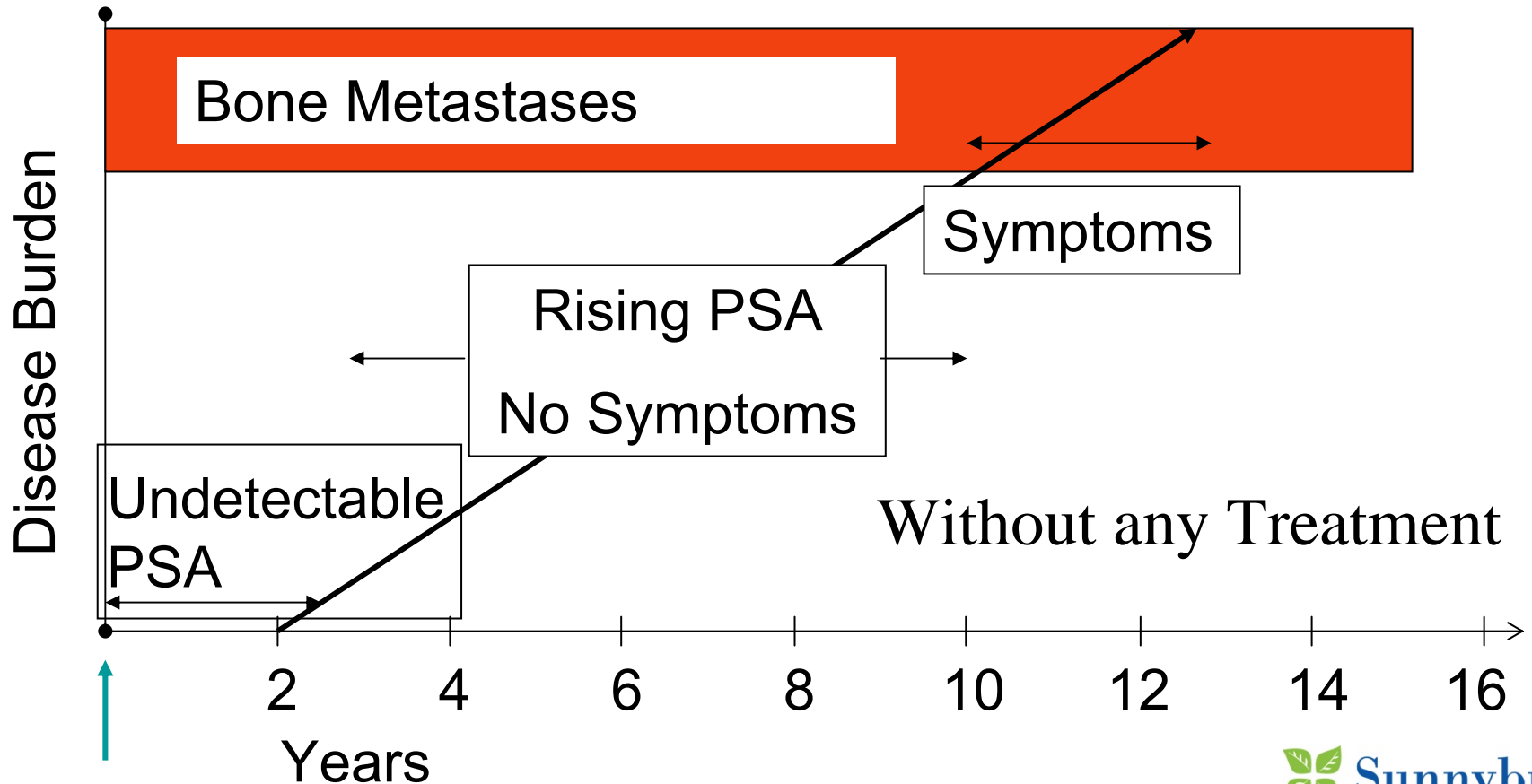
Natural History of Rising PSA

- Following Prostatectomy, 35% of men will develop rising PSA
- Without Treatment Average Time:
 - From surgery to rising PSA = 2 yrs
 - Rising PSA to spread to bone = 8 years
 - Spread to bone to death = 5 years
 - Survival from time of rising PSA > 15 years

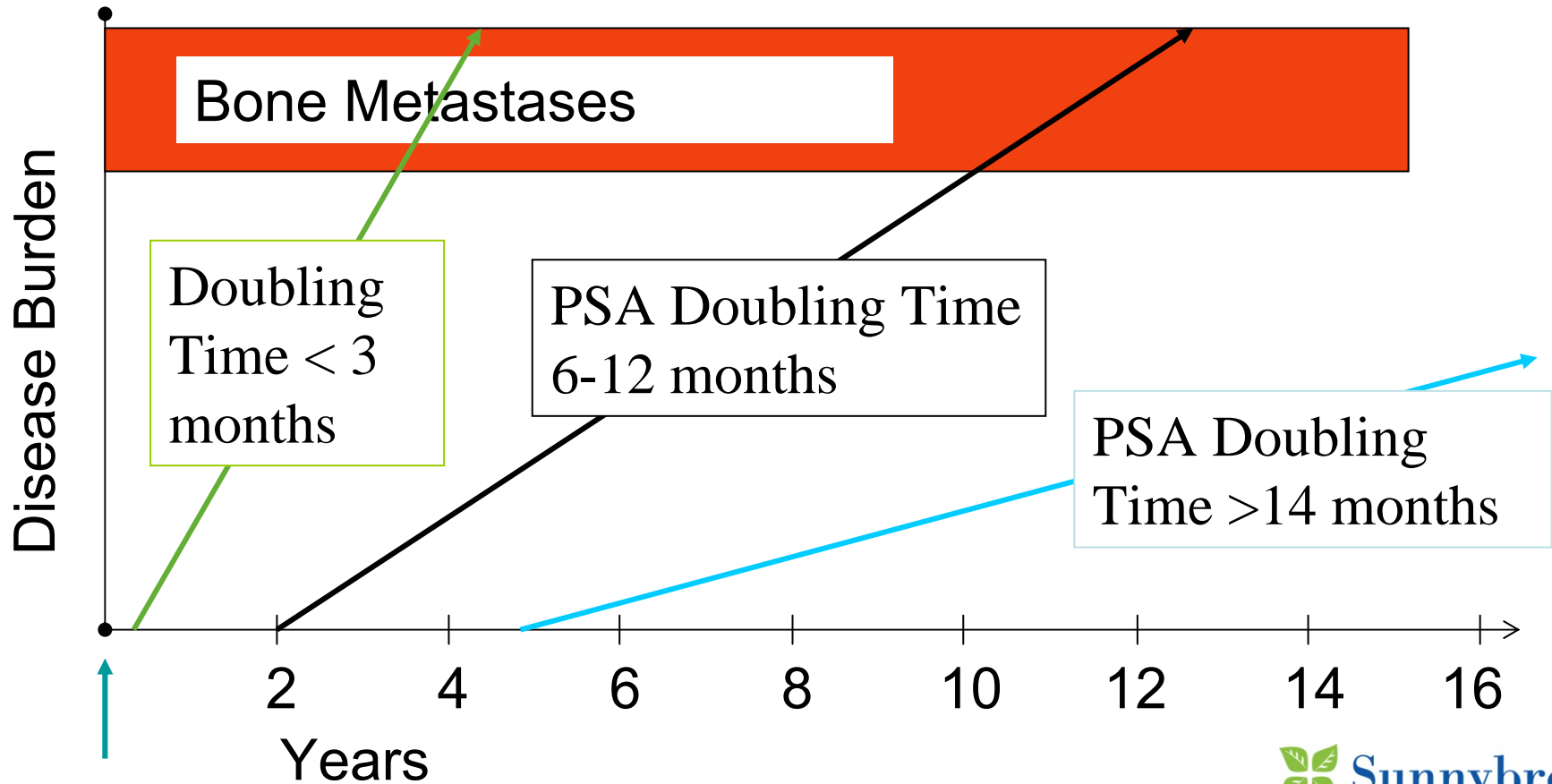
Natural History of Rising PSA



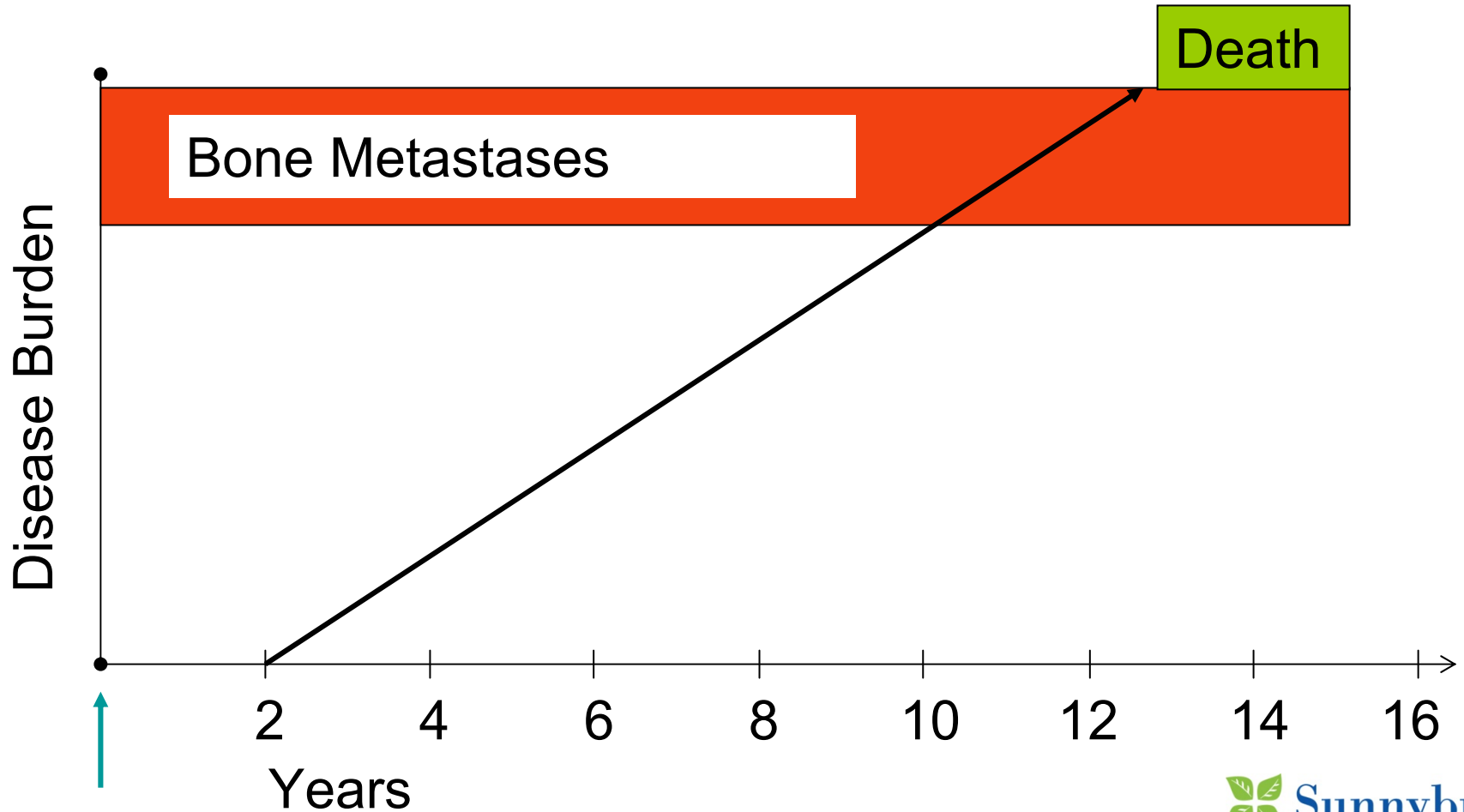
Natural History of Rising PSA



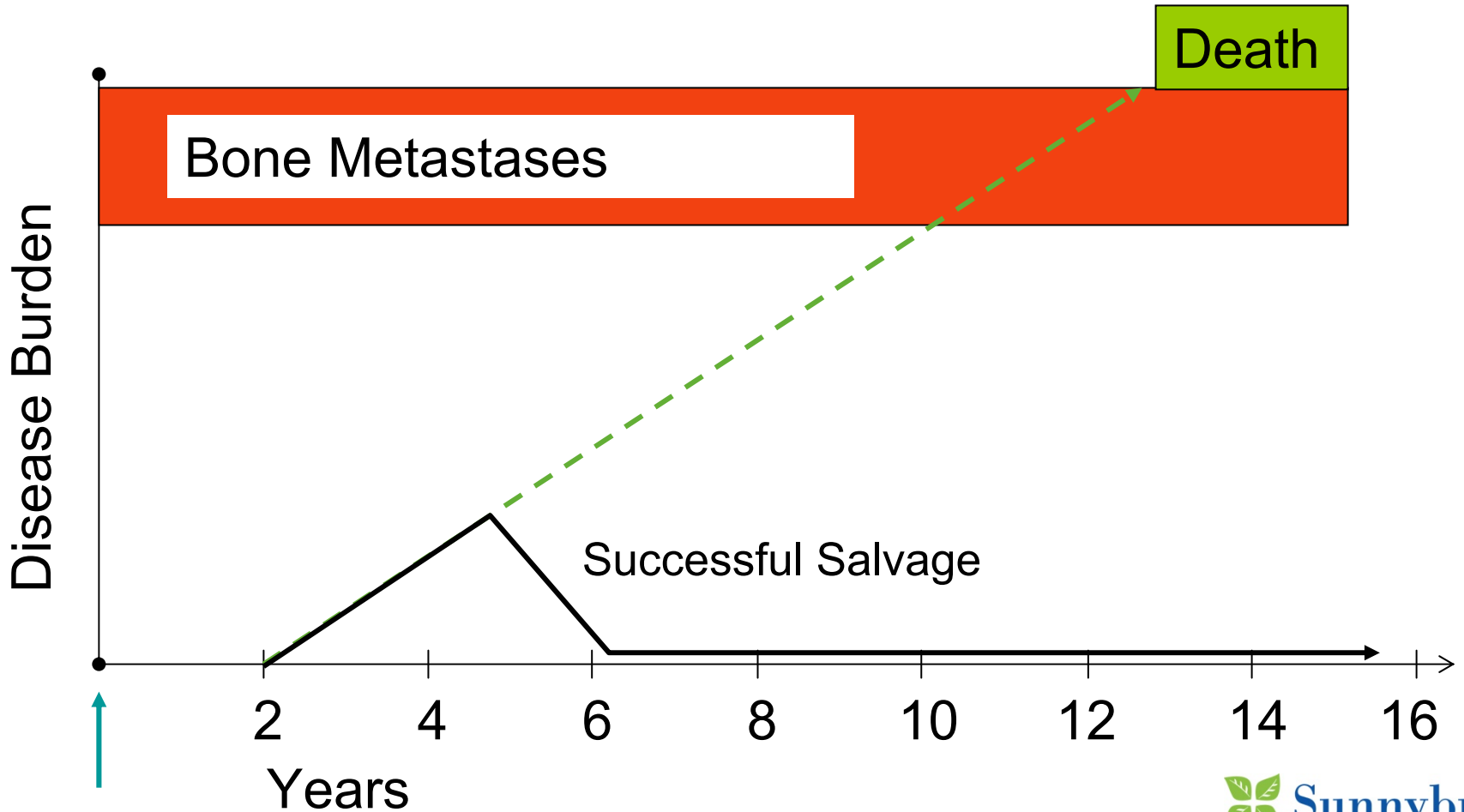
Natural History of Rising PSA



Management



Management



Management of Rising PSA

- If PSA rising quickly
 - Hormones +/- Radiation
 - Chemotherapy
- If PSA rising relatively slowly
 - Consider local salvage
- If PSA rising very slowly
 - Watching may be appropriate or salvage

Summing Up

- PSA is produced by the prostate and prostate cancer
- Not all that useful for screening
- Very useful to help determine prognosis and treatment
- Monitors progress of cancer and response to treatment

ANY PERSONS (EXCEPT PLAYERS)
CAUGHT COLLECTING GOLF BALLS
ON THIS COURSE WILL BE
PROSECUTED AND HAVE THEIR
BALLS REMOVED

