



Us TOO University Presents: Understanding Diagnostic Testing for Prostate Cancer Patients

Today's speaker is Manish Bhandari, MD

Program moderator is Pam Barrett,
Us TOO International

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Agenda

- 7:00 pm Welcome & Introductions
- 7:04 pm Presentation by Dr. Bhandari begins
 - Overview of Different Diagnostic Testing
 - Prostate Cancer Staging
 - Monitoring Tools
- 7:45 pm Live Q&A Begins
- 7:58 pm Wrap-up
- 8:00 pm Call/Webinar Ends

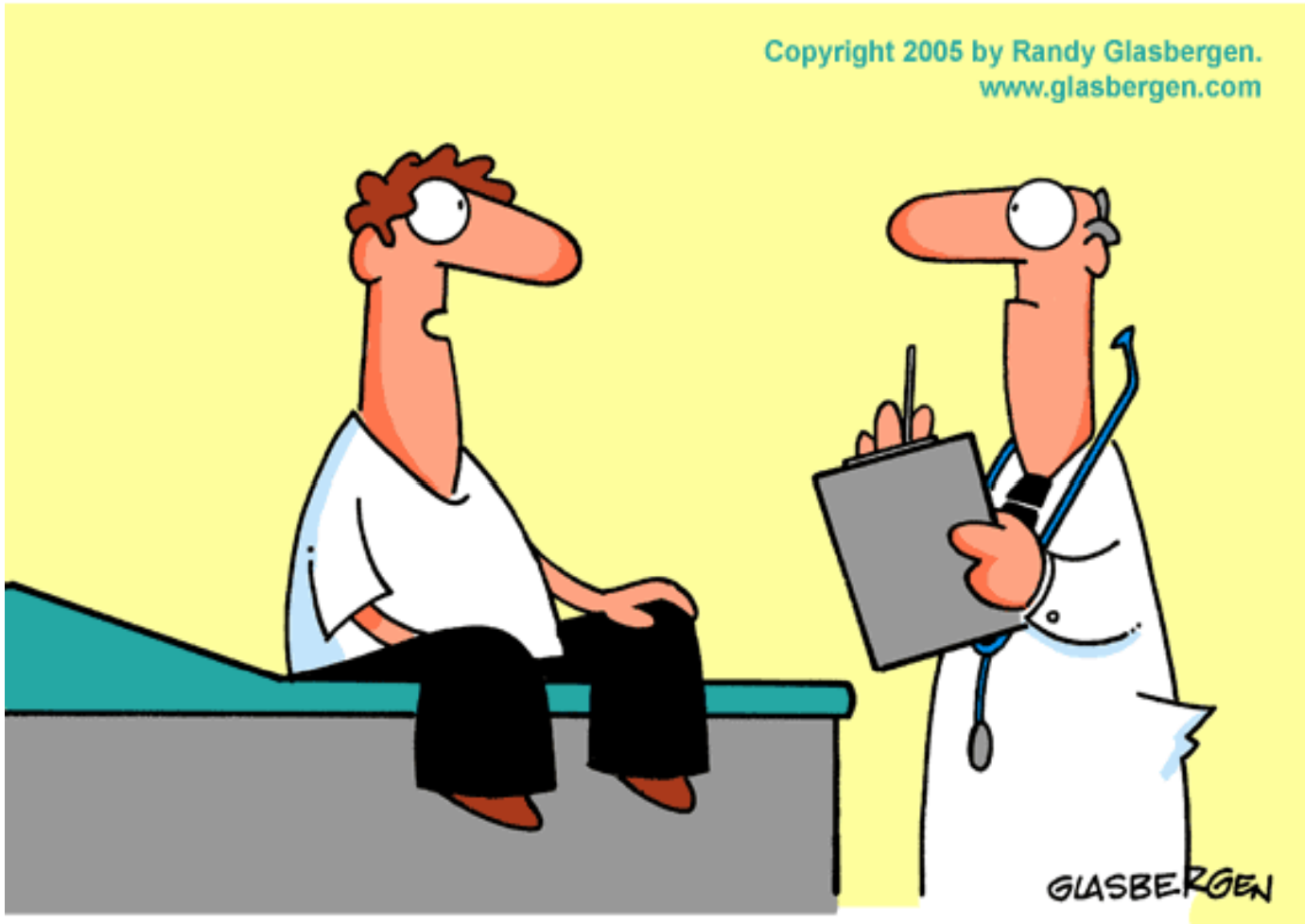


Manish Bhandari, MD

Dr. Bhandari is a practicing oncologist in Cincinnati, OH and focuses on genito-urinary cancers including systemic therapy for prostate cancer. He did his medical school training in Boston at Harvard Medical school and Oncology training at University of Michigan at Ann Arbor.



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**“I already diagnosed myself on the Internet.
I’m only here for a second opinion.”**

Diagnostic Testing Along the Journey

Diagnostic tests are useful tools to help your physician manage your care throughout your journey with prostate cancer

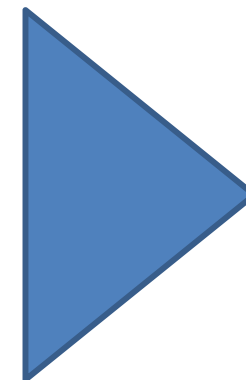
Initial Diagnosis

Monitor treatment response, progression, and prognosis

The Initial Diagnosis

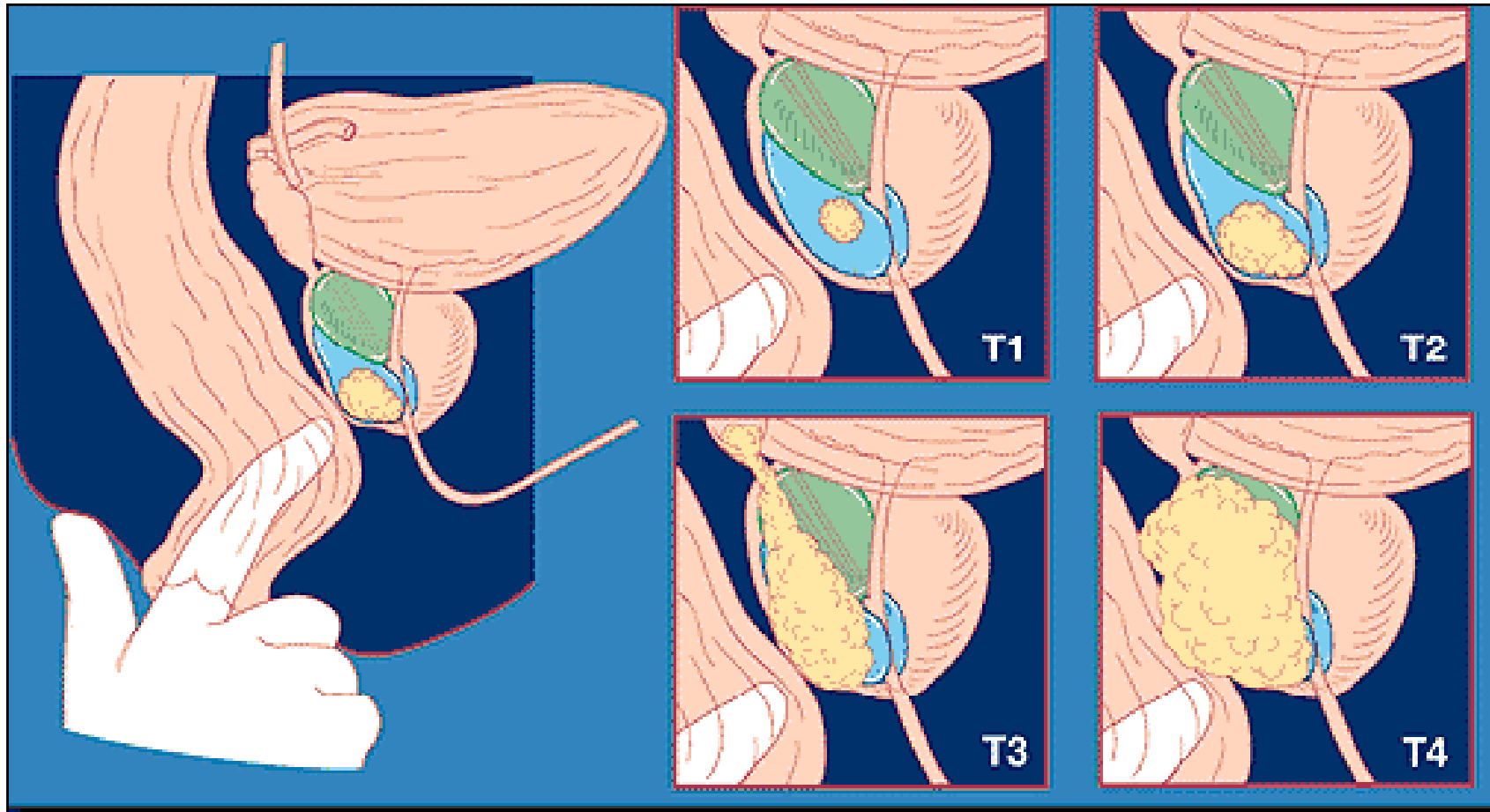
Key tools to confirm diagnosis:

Fluids	Measure levels of hormones and proteins in your blood or urine	<ul style="list-style-type: none"> • Testosterone & DHT • PSA • free PSA
Touch	Feeling the prostate for changes or abnormalities	<ul style="list-style-type: none"> • Digital Rectal Exam (DRE)
Tissue	Samples taken from the prostate to analyze for cancer	<ul style="list-style-type: none"> • Biopsy • Lymph Node Dissection • Cellular & Molecular Analysis
Image	Taken of internal organs and bones to help determine disease stage	<ul style="list-style-type: none"> • MRI • CT Scan • Ultrasound • P.E.T. Scan • Bone Scan



Staging
Gleason Score

Prostate Cancer Diagnosis Digital Rectal Exam (DRE)



**BUT only 1/2 of nodules are CA
and most men with CA have no nodules.**

Prostate Cancer Diagnosis

Prostate Specific Antigen (PSA)

- Glycoprotein (mw=34kD) secreted exclusively by prostate epithelium; a protease
- Enters serum in prostate disease/trauma states
- If serum level 4-10 ng/ml ~1/4 chance of CaP; >10 ng/ml ~ 2/3 chance of CaP
- Highest positive predictive value of any single test, but not specific for CaP:
 - Many men with BPH have PSA > 4.0 ng/ml
 - 25% of men with CaP have PSA < 4.0 ng/ml



Prostate Cancer Diagnosis Free PSA (fPSA or PSA-f)

- Most PSA are bound to proteins in the blood; however some are free-floating
- The free PSA test measures the proportion of free PSA to bound PSA in your blood sample
- Most men with prostate cancer have a low f-PSA (<15%)
- Percentages >25% are much less likely associated with prostate cancer
- The free PSA test may spare you an unnecessary biopsy

Gleason Score – How is it calculated?

- Calculated from tissue obtained during biopsy
 - Biopsy needle used to remove several cores of tissue from various areas on prostate gland
- Describes different types of cells to help estimate
 - How fast the cancer is likely to grow
 - A patient's life expectancy
- Two numbers determined by the pathologist
 - First number indicates type of cancer cells that are most numerous in the tissue
 - Second number indicates the type of cancer cell that is second most numerous in the tissue
 - **Gleason Score = first number + second number**

Gleason Score – What does it mean?

2 to 4	Cancer is very low on aggression scale
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5 to 6	Cancer is mildly aggressive
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7	Cancer is moderately aggressive
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8- 10	Cancer is highly aggressive
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Note: 3+4 \neq 4+3

Cancer Staging

Stage I

- Cancer is found only in the prostate
- Small enough that no tumor is felt by the physician during the DRE

Stage II

- Cancer is found only in the prostate
- May be big enough to be felt by the physician during the DRE

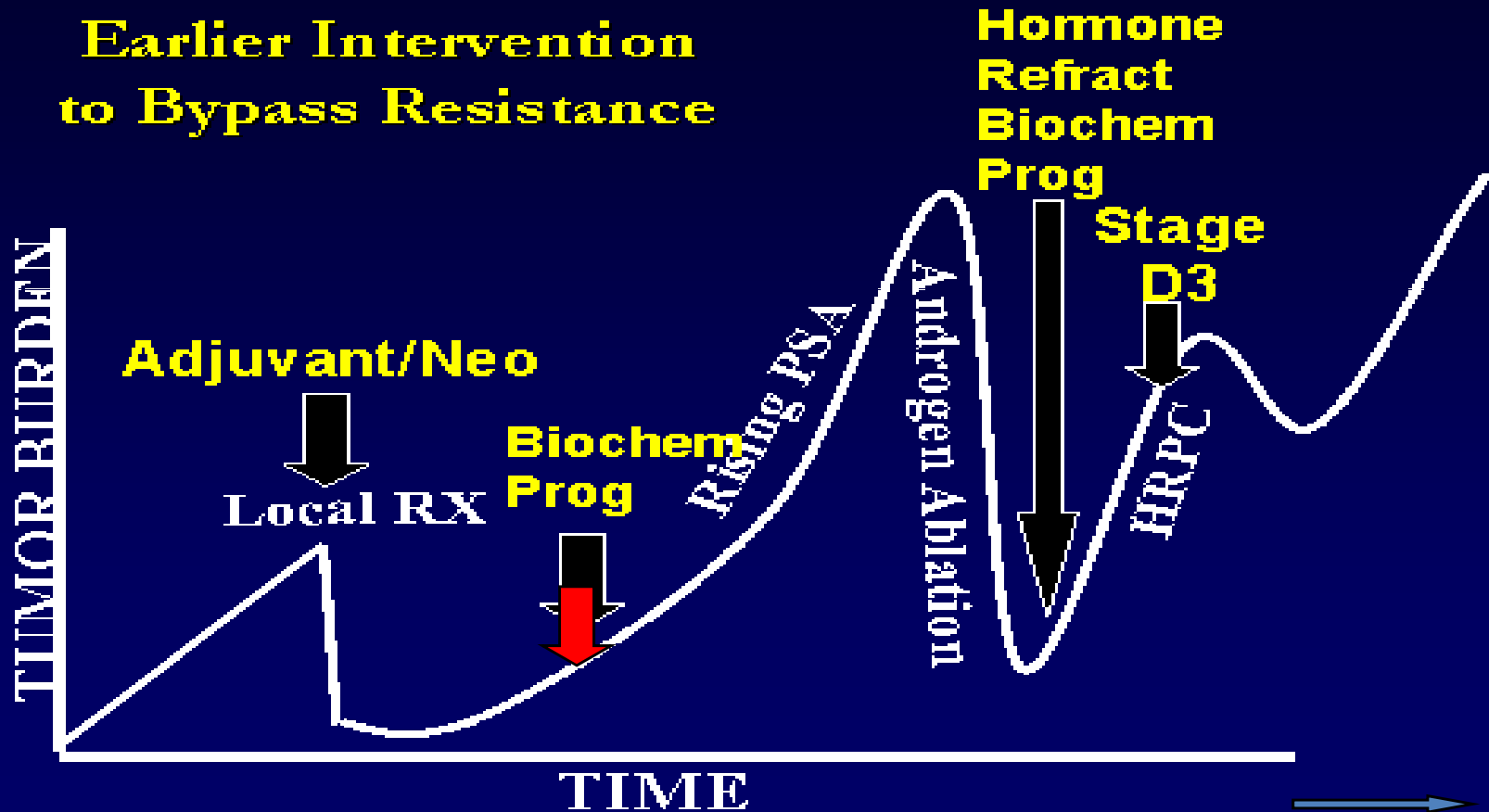
Stage III

- No longer confined to just the prostate
- Has not yet spread (metastasized) to tissues outside the pelvic area.
- Tumors may have spread to nearby seminal vesicles

Stage IV

- Cancer is detected in tissue far from prostate
- N+ indicates cancer has spread to lymph nodes
- M+ indicates the cancer has metastasized or spread to distant tissue or bone

Disease Course of Prostate Cancer



Tumor Burden refers to the number of cancer cells, the size of a tumor, or the amount of cancer in the body. Also called tumor load.

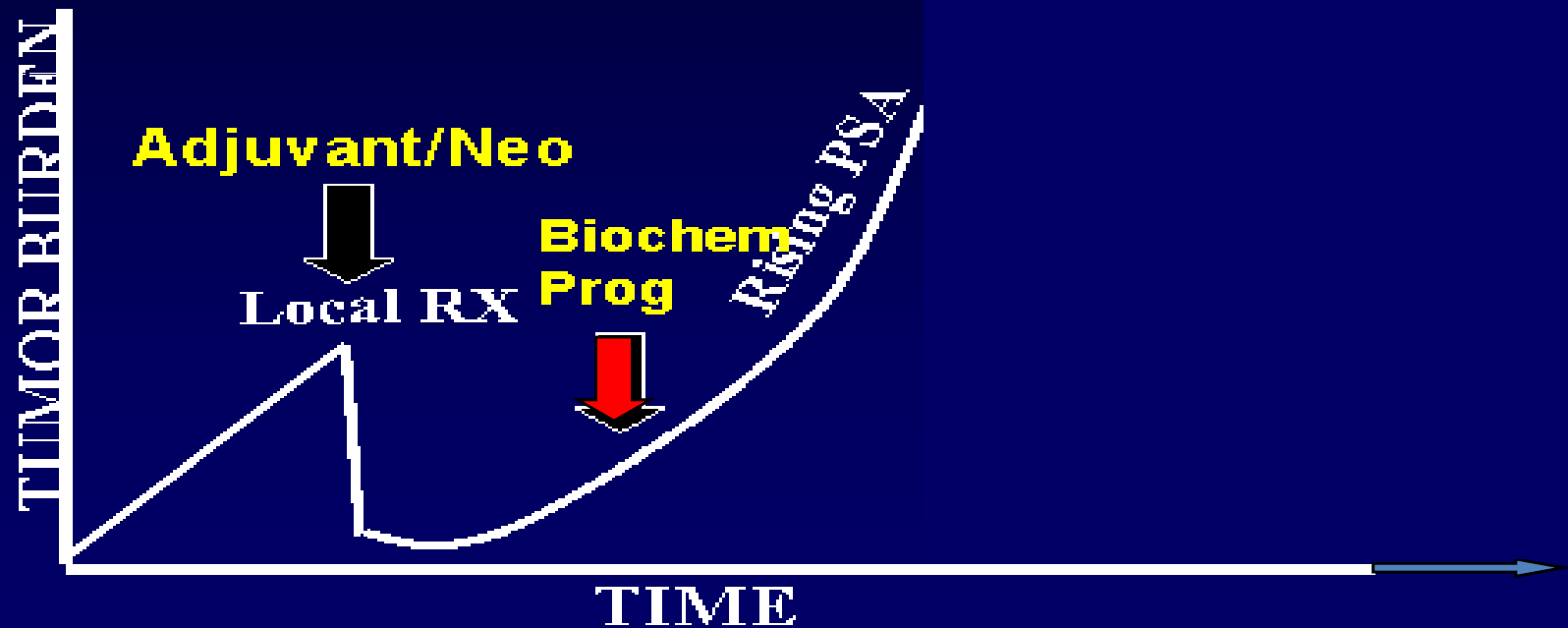
Disease Course of Prostate Cancer:

Primary = FIRST, LOCAL prostate treatment



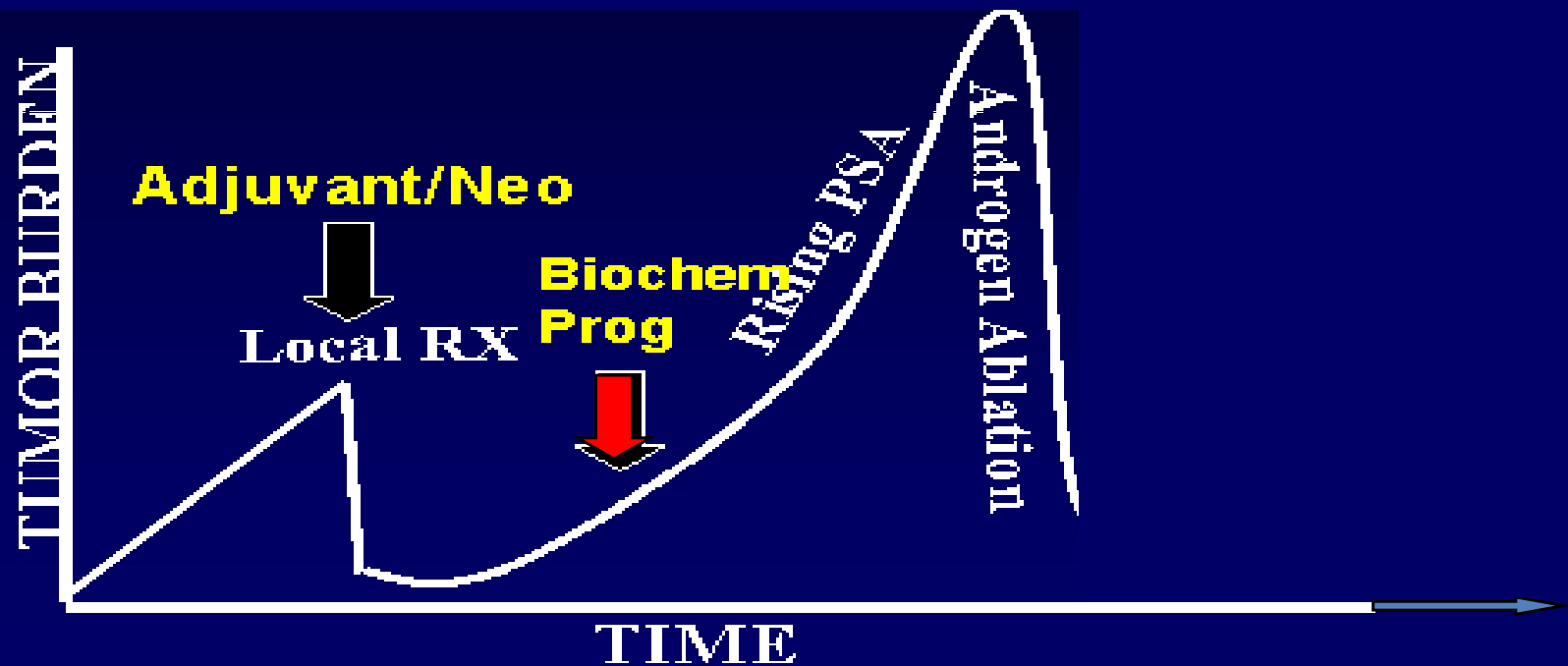
Disease Course of Prostate Cancer:

Biochemical progression = "PSA relapse"



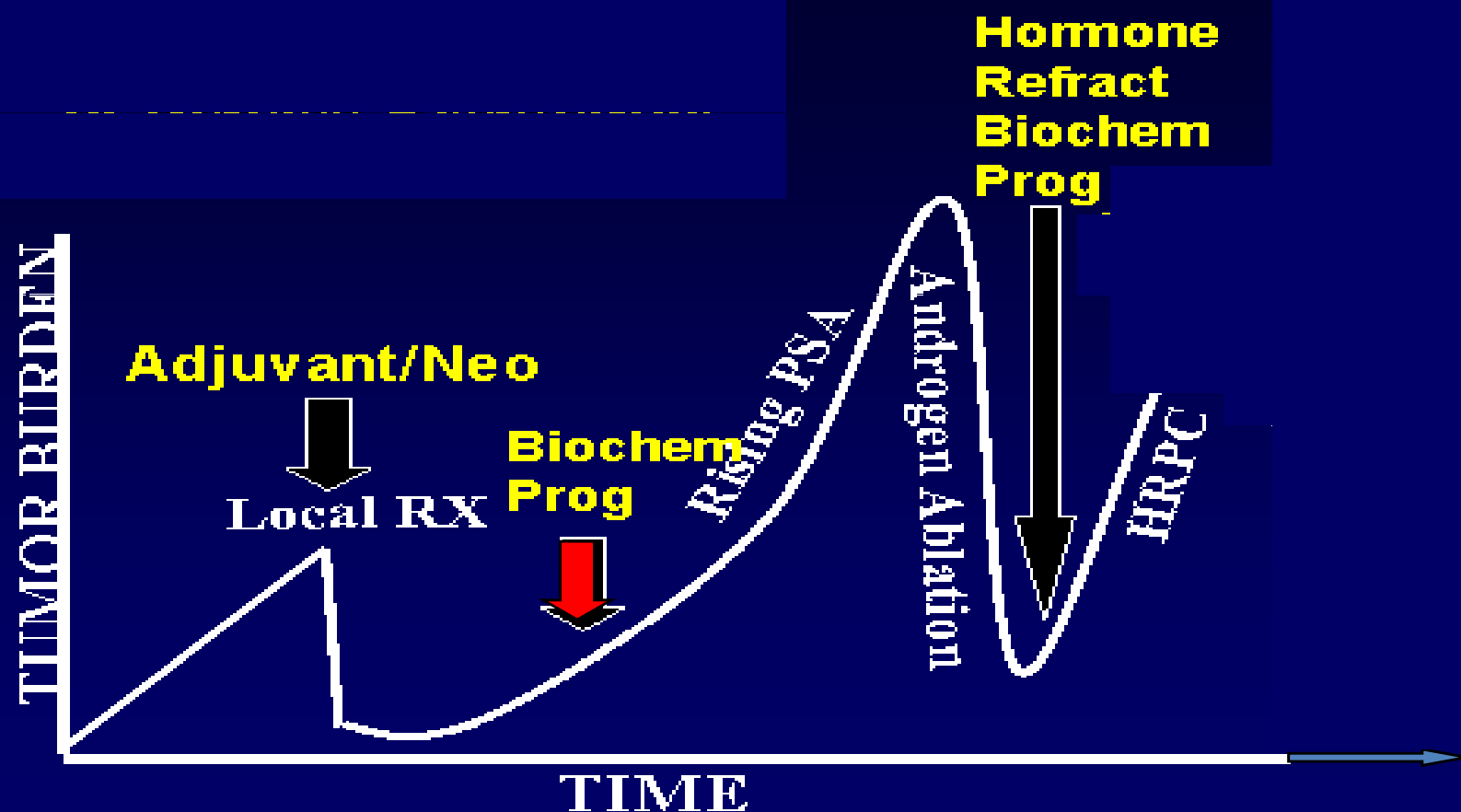
Disease Course of Prostate Cancer:

Hormone responsive = “Androgen sensitive” Prostate Cancer



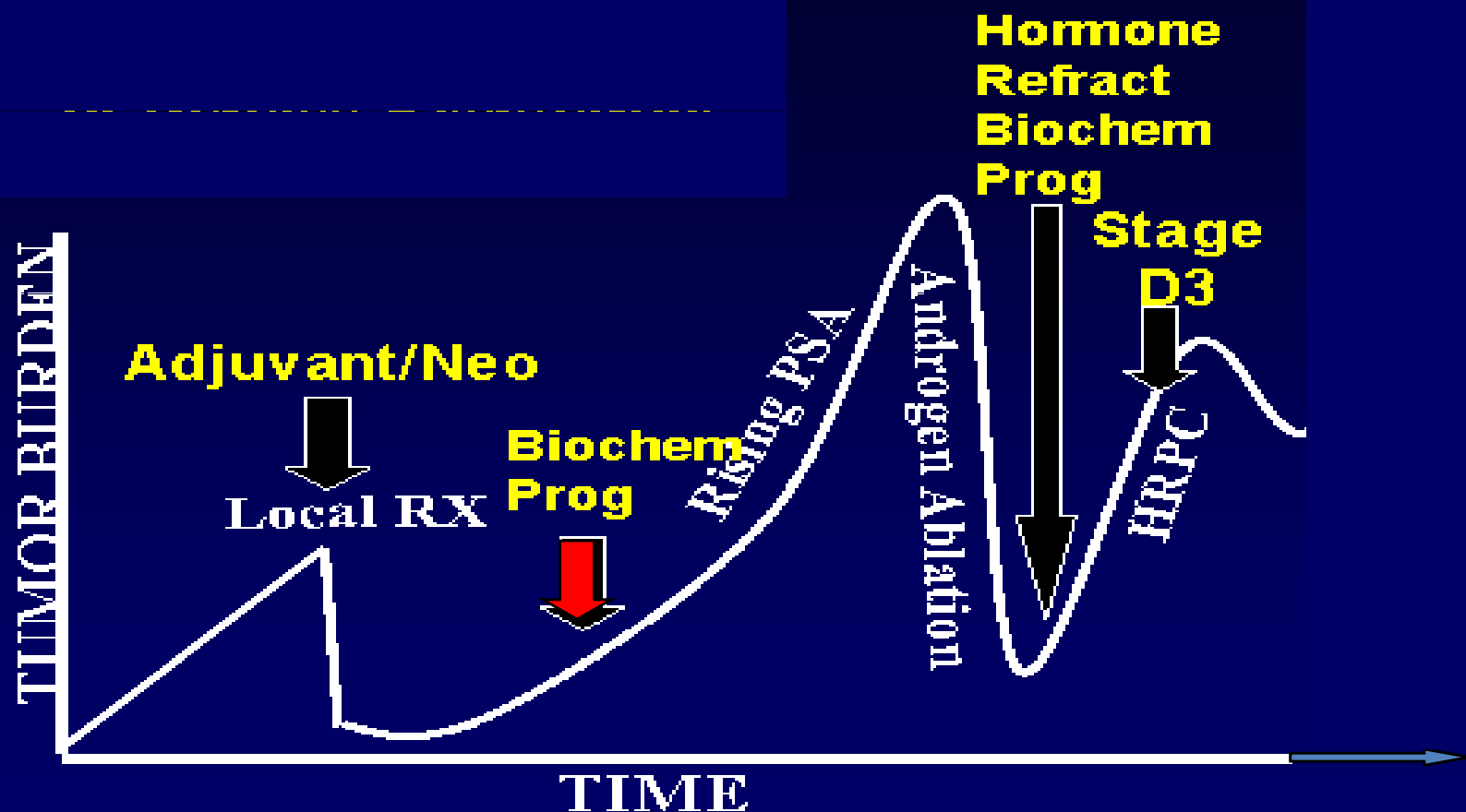
Disease Course of Prostate Cancer:

Hormone refractory (HRPC) = "Androgen resistant" PSA-only Prostate Cancer

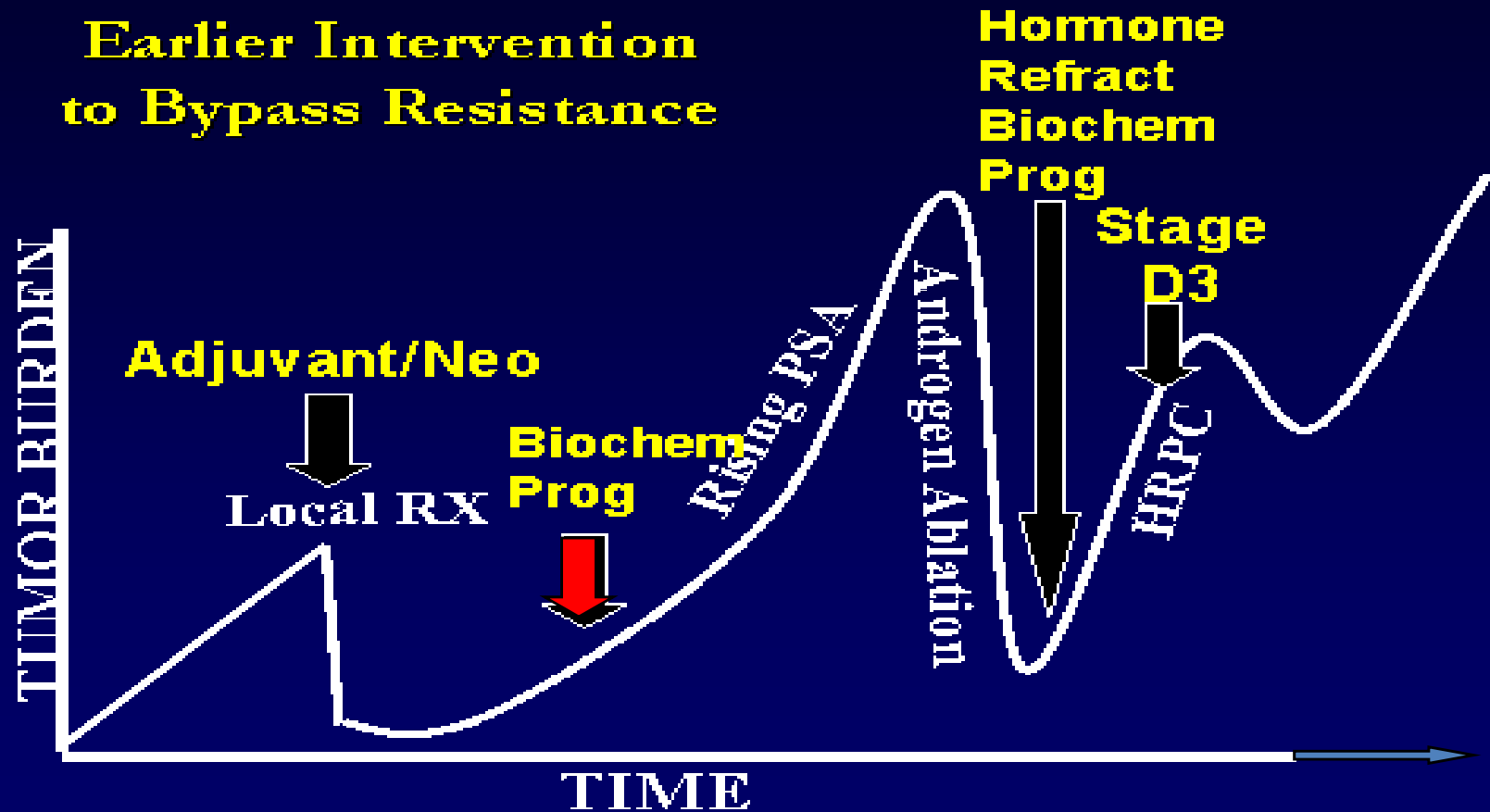


Disease Course of Prostate Cancer:

Metastatic HRPC = Stage D2, D3 = Bone scan positive Prostate Cancer



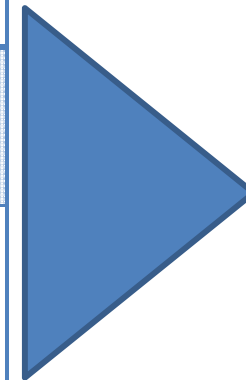
Disease Course of Prostate Cancer



Monitoring Your Condition

Many of the same tools can be used for monitoring after initial diagnosis:

Fluids	Measure levels of hormones and proteins in your blood or urine	<ul style="list-style-type: none"> • Testosterone & DHT • PSA, free PSA • free PSA • Circulating Tumor Cells (CTCS)
Touch	Feeling the prostate for changes or abnormalities	<ul style="list-style-type: none"> • Digital Rectal Exam (DRE)
Tissue	Samples taken from the prostate to analyze for cancer	<ul style="list-style-type: none"> • Biopsy • Cellular & Molecular Analysis
Image	Taken of internal organs and bones to help determine disease stage	<ul style="list-style-type: none"> • MRI • CT Scan • Ultrasound • P.E.T. Scan • Bone Scan



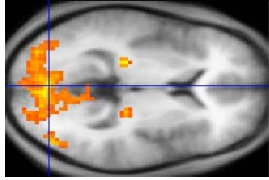

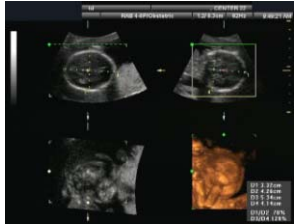
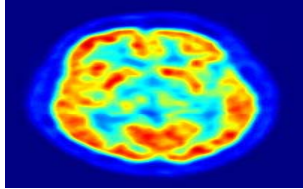
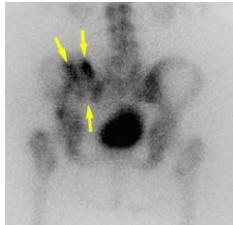
Monitor for changes to your condition

Monitoring Tools

A closer look at some key tools:

Imaging	Used to monitor whether cancer has spread to near or distant tissue or to the bones
PSA	One indicator of abnormal activity in the prostate gland
Testosterone & DHT	Measures the effectiveness of hormonal blockade treatment. It also is useful in assessing causes of sexual dysfunction.
Cellular / Molecular Analysis	Used to develop a better understanding of the underlying biology of the tumor cell
Circulating Tumor Cells (CTCs)	The number of circulating tumor cells in your blood is predictor of progression free and overall survival and is monitored for change in prognosis over time

Imaging

MRI (Magnetic resonance imaging)		<ul style="list-style-type: none">• Takes cross-sectional slices (views) from several angles• Looks for signs that cancer may have metastasized (spread)
CT Scan (Computed tomography scan)		<ul style="list-style-type: none">• Scans show a slice, or cross-section, of the body• Image is created using controlled amounts of x-rays -- beams of high-energy radiation that are passed through the body
Ultrasound		<ul style="list-style-type: none">• Creates images called sonograms by giving off high-frequency sound waves that go through your body• Ultrasound cannot tell a benign (not cancer) tumor from one that is cancer
P.E.T Scan (nuclear imaging)		<ul style="list-style-type: none">• Used to find tumors, especially in the bones and thyroid gland. They are also used to study a cancer's stage (extent of its spread) and to evaluate whether treatment is working
Radionuclide Bone Scan		<ul style="list-style-type: none">• Small amount of radioactive material is injected into a vein and travels through the bloodstream. The radioactive material collects in the bones and is detected by a scanner• Used to check for cancer cells in the bone

Testosterone & DHT*

- Prostate cancer cells utilize male hormones known as androgens (testosterone is the most well known)
- Blocking these hormones generally reduces prostate cancer growth, at least temporarily and sometimes for a very long time
- Levels of these hormones are assessed using a blood test which measures the effectiveness of hormonal blockade treatment

* Dihydrotestosterone

PSA for Monitoring

- Your doctor may monitor for a rise in your PSA level over time to watch for signs of recurrence or metastatic disease
- If your PSA continues to rise, your doctor is likely to order additional tests (e.g. imaging) to decide whether additional treatment may be necessary
- A rise in PSA does not always mean your cancer has recurred or spread.
 - Prostate inflammation or enlargement may cause PSA to rise

Prostate cancer is a complex disease. PSA along with other variables should be considered by you and your doctor to make the best decision for you

PSA Doubling Time (PSADT)

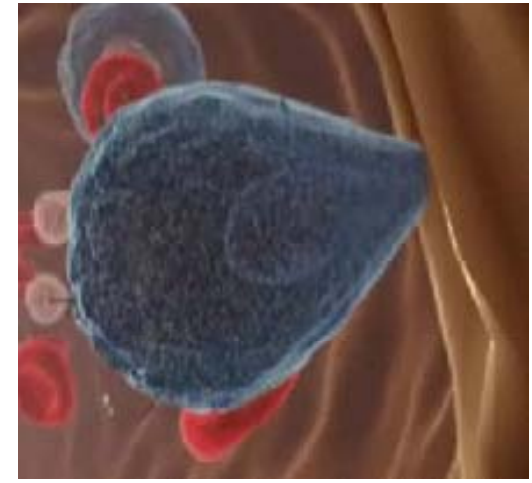
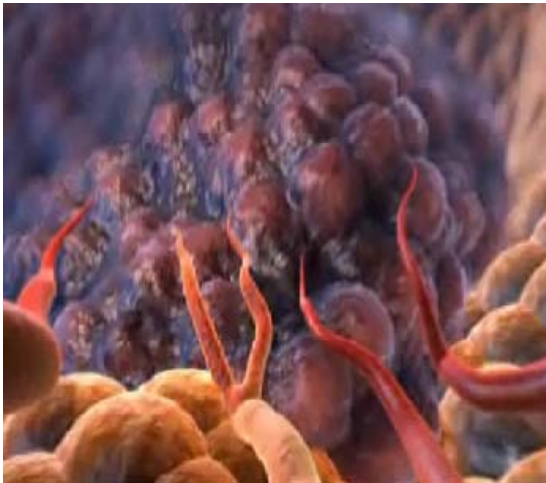
PSA Doubling Time = time it takes for PSA to double

- Used to help predict risk of recurrence, metastases, and cancer related death
 - < 3 months associated with higher risk of a poor outcome
 - >15 months associated with a more favorable outcome
 - 3-15 months – other clinical factors are better for determining risk
- See Memorial Sloan Kettering online tool for calculating PSA doubling time
<http://www.mskcc.org/applications/nomograms/prostate/PsaDoublingTime.aspx>

Reference: <http://prostatecancerinfolink.net/2008/05/29/guidelines-on-psa-doubling-time>

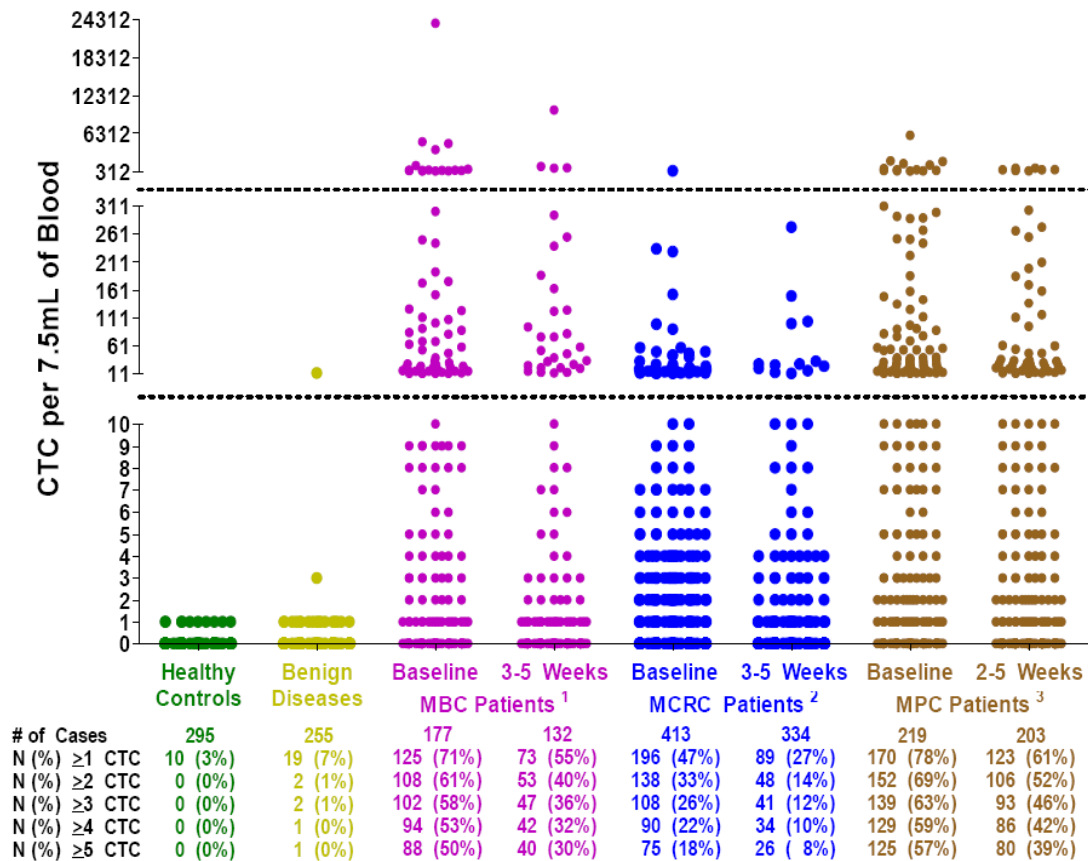
What is a Circulating Tumor Cell?

A Circulating Tumor Cell (CTC) is a cancer cell that has detached from a solid tumor lesion and entered the peripheral blood circulation



Why are CTCs Important?

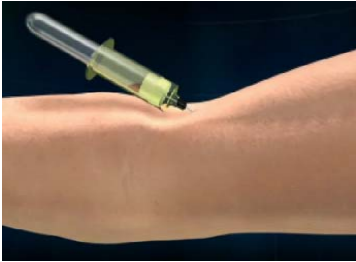
Figure 1. Frequency of CTC in Controls (Subjects without Cancer) and Patients with Metastatic Breast¹ (MBC), Metastatic Colorectal² (MCRC) or Metastatic Prostate Cancer³ (MPC) before Initiation of a new line of Therapy (Baseline) and ~2-5 weeks After the Initiation of Therapy.



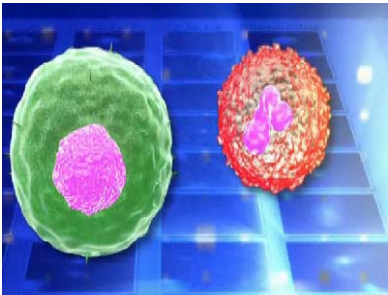
* In Controls (Subjects without Cancer) and Patients with MBC1, MCRC2, or MPC3 before Initiation of a new line of Therapy (Baseline) and ~2-5 weeks After the Initiation of Therapy.

- CTCs are rarely found in healthy patients or patients with non-malignant or other benign diseases
- Certain number of CTCs in the blood stream are correlated with poor prognosis in metastatic breast, prostate, & colorectal cancer patients

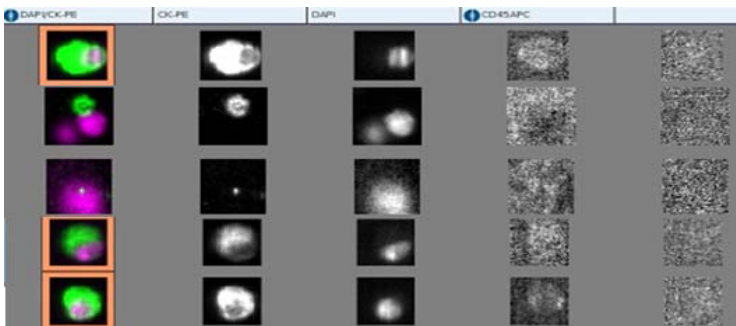
How are CTCs Measured?



- A tube of blood is drawn & sent to a lab for testing

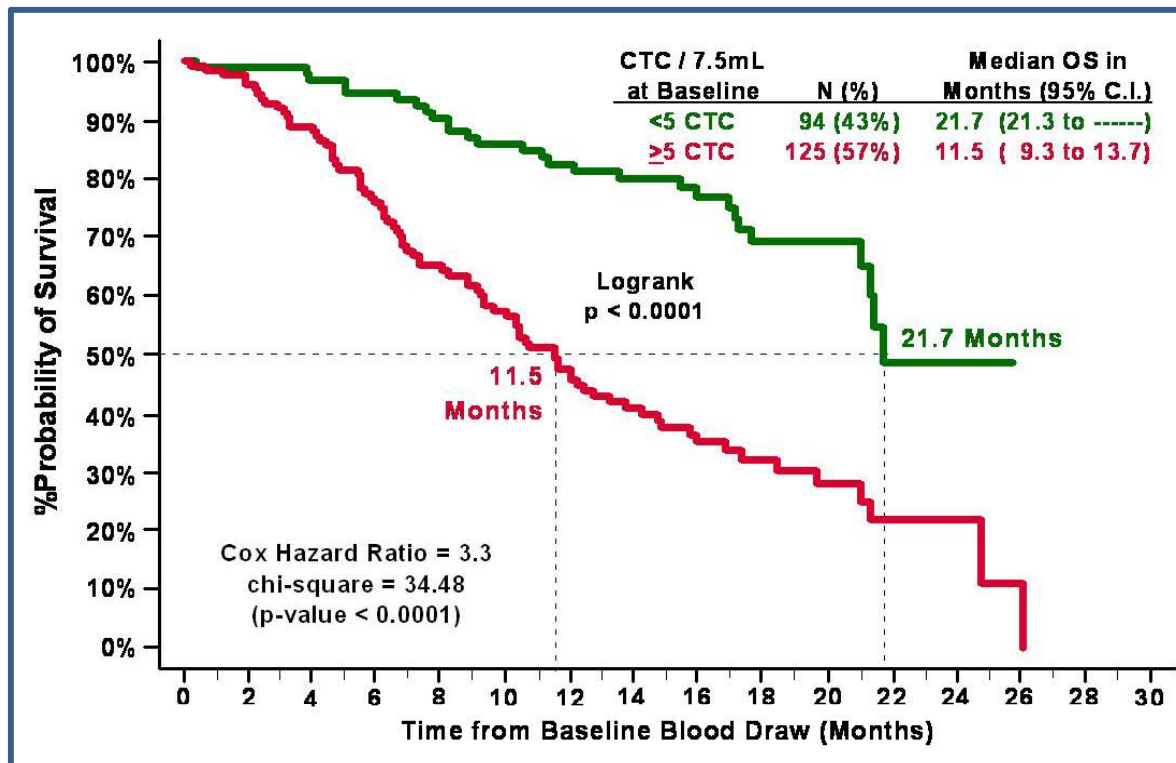


- The blood sample is processed on an automated system
- Antibodies are added to the blood to capture CTCs & to differentiate them from other cells (e.g. white cells)



- Images of cells are reviewed by the lab to determine if the cells are CTCs
- The system reports out the total number of CTCs found in the tube of blood

CTC Count – What does it mean?



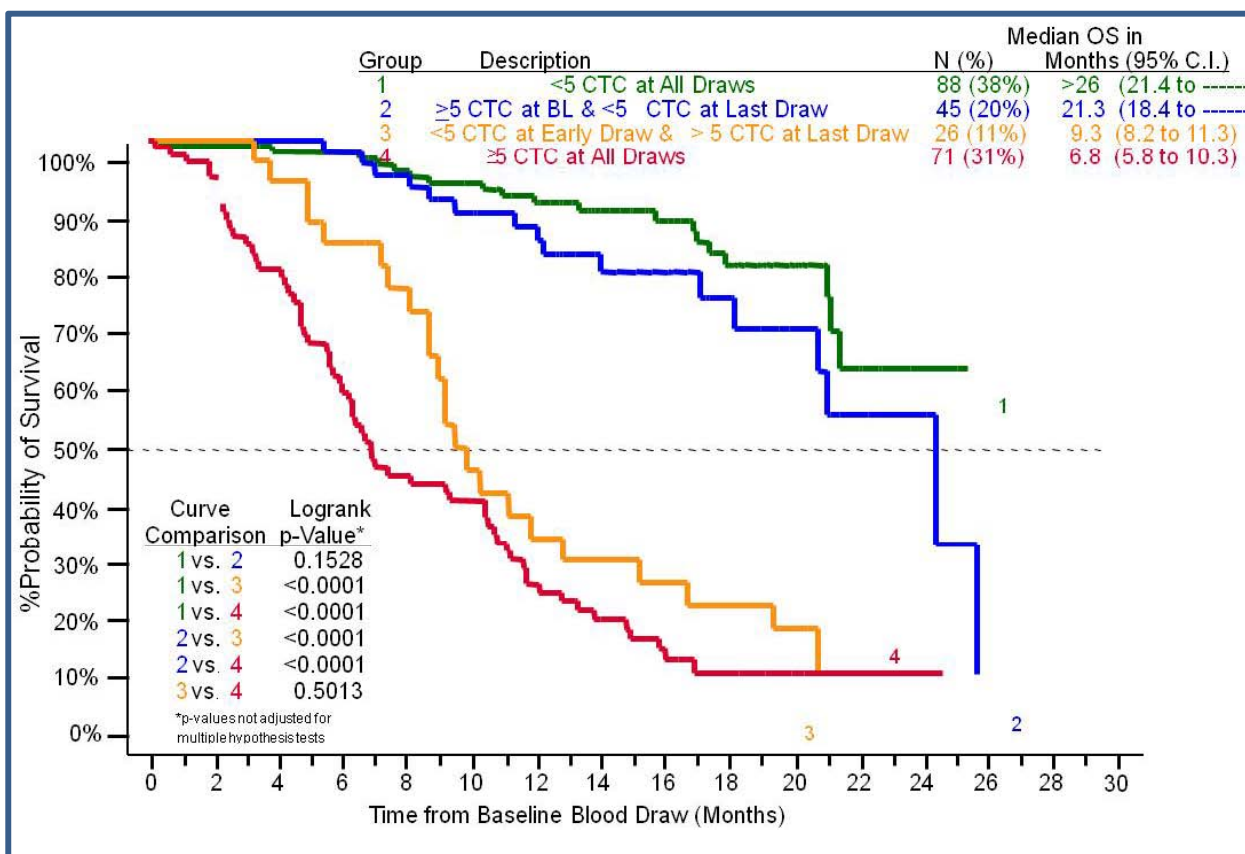
- Patients with <5 CTCs (GREEN) have greater median overall survival (almost double) versus patients with ≥5 CTCs (RED)

Data from CELLSEARCH® CTC Test Clinical Trials

Results are similar for predicting progression free survival

The Value of Monitoring CTCs

Prognosis can change



- **GREEN LINE:** Patients with <5 CTCs at all measurement points
- **RED LINE:** Patients with ≥5 CTCs at all measurement points
- **BLUE LINE:** Patients who started off with ≥5 CTCs but changed to <5 CTCs
- **ORANGE LINE:** Patients who started off with <5 CTCs but changed to ≥ 5 CTCs

Data from CELLSEARCH® CTC Test Clinical Trials

Results are similar for predicting progression free survival

CTC Summary

- A monitoring tool for patients with Metastatic Prostate Cancer
- A simple blood test that provides your physician with additional information to help manage your overall care
- Obtain initial CTC count prior to initiation of a new line of therapy
- Monitor CTC count over time to detect changes in prognosis

Limitations:

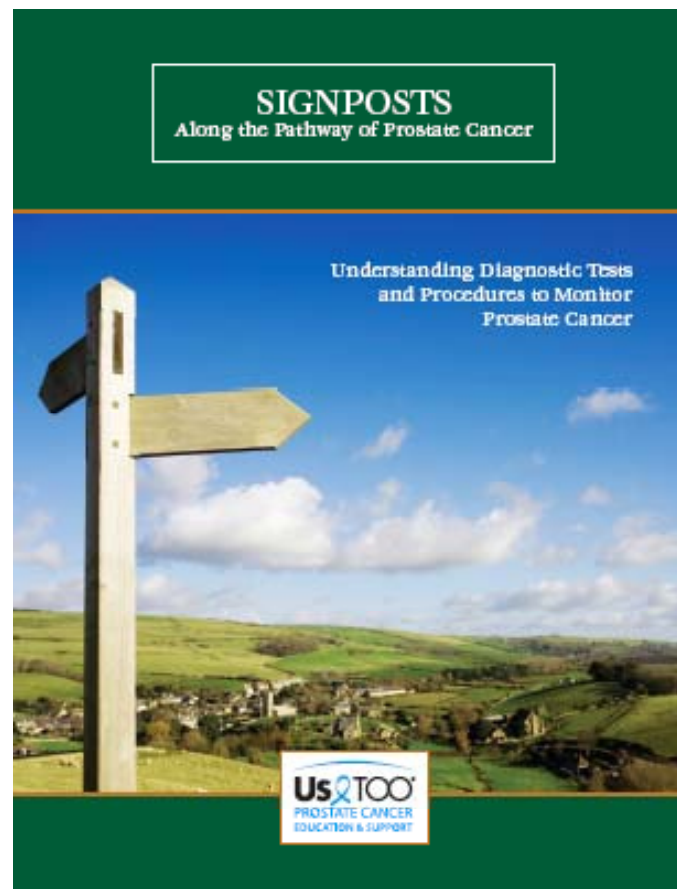
- CTCs are not used for initial diagnoses of prostate cancer
- If you are a patient with metastatic prostate cancer, your doctor must use your CTC count along with other medical information, including tests like imaging and PSA, to monitor how you are doing
- CTC tests cannot be used to determine how you will respond to treatment

Actions You Can Take

- Keep an eye on other indicators and make sure to talk to your doctor if you have any questions or concerns!
- Some considerations include
 - Diet / Nutrition
 - Exercise / Flexibility
 - Weight
 - Incontinence
 - Sexual Function

Diagnostic Resources

- There are a variety of diagnostic tests designed to identify how you are doing and to assist in determining the most appropriate actions to take for YOU.
- Continue to educate yourself about these options so that you can provide input into your care.



Recommended resource available at www.ustoo.org

Questions / Discussion

- Web participants can ask a question by typing it in the CHAT box
- Callers can ask a question by pressing *1 on their telephone keypad, and will initially talk with Jackie from Us TOO

For More Information

- An audio and video archive and transcription of this presentation will be available at www.ustoo.org
- Read these Us TOO educational brochures:
 - *Prostate Cancer Patient's Guide to Hormone Therapy*
 - *What You Need to Know for Better Bone Health*
 - *What now? Hope and options when experiencing a rising PSA*
 - *The Prostate Cancer Playbook: For Prostate Cancer Recurrence, Rising PSA, and Advanced Disease*
- Participate in an online discussion group
- Thank you!

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