

Prostate Cancer

Awareness, Diagnosis,
Treatment and
Proton Therapy

Updated: 2015

Prostate Cancer Facts

- Most common cancer in men
- 1 in 6 men will be diagnosed
- 2nd leading cause of cancer death in men
- 241,000 men will be diagnosed this year in U.S.
- 1 in 36 men will die this year
- PCa and breast cancer statistics are almost identical



August 10, 2000

The day I was diagnosed.



Objective: To Educate

- Prostate cancer (PCa) awareness
- Prevention
- Detection/diagnosis
- Treatment options
- **Your role**



No Medical Advice

Material appearing here represents opinions offered by non-medically-trained laypersons. Comments shown here should NEVER be interpreted as specific medical advice and must be used only as background information when consulting with a qualified medical professional.

Sources of information presented here: LLUMC, UFPTI, MD Anderson, MGH



What makes me an authority?

- Prostate cancer survivor
- Read every book, researched Internet
- Interviewed dozens of physicians
- Interviewed hundreds of patients
- Founded/run international support group
- Studied PCa for 11years
- Serve on Hospital Advisory Board
- Wrote a book!
- And there is much I don't know.



What do these men have in common?



More Prostate Cancer Facts

- **350,000+ men died of PCa in US in 1990s**
 - same number as breast cancer deaths in women
 - 3 times as many deaths as caused by AIDS
- **Breast cancer & AIDS receive 10-25 times the \$\$\$**
- **25% of those diagnosed are under 65 years old**



Risk Factors

- **Male over 50 (>40 if at high risk)**
- **Family history**
 - 1 relative: risk doubles (2/6)
 - 2 relatives: five fold increase (5/6)
 - 3 relatives: 97% chance (roughly 6/6)
- **Race/ethnicity**
 - High: African American, NA, NW Europe
 - Low: Asian, Hispanic, Native American
- **Red meat, high fat, low fiber diet**
- **High testosterone levels**
- **BPH (4 times the rate)**



PCa Signs and Symptoms

- Urine flow problems
- Blood in urine
- Loss of appetite and weight
- Pain in lower back, pelvis, or upper thighs
- Lump or roughness in prostate felt by DRE (digital rectal exam)
- And, the most common symptom?

No symptom at all!

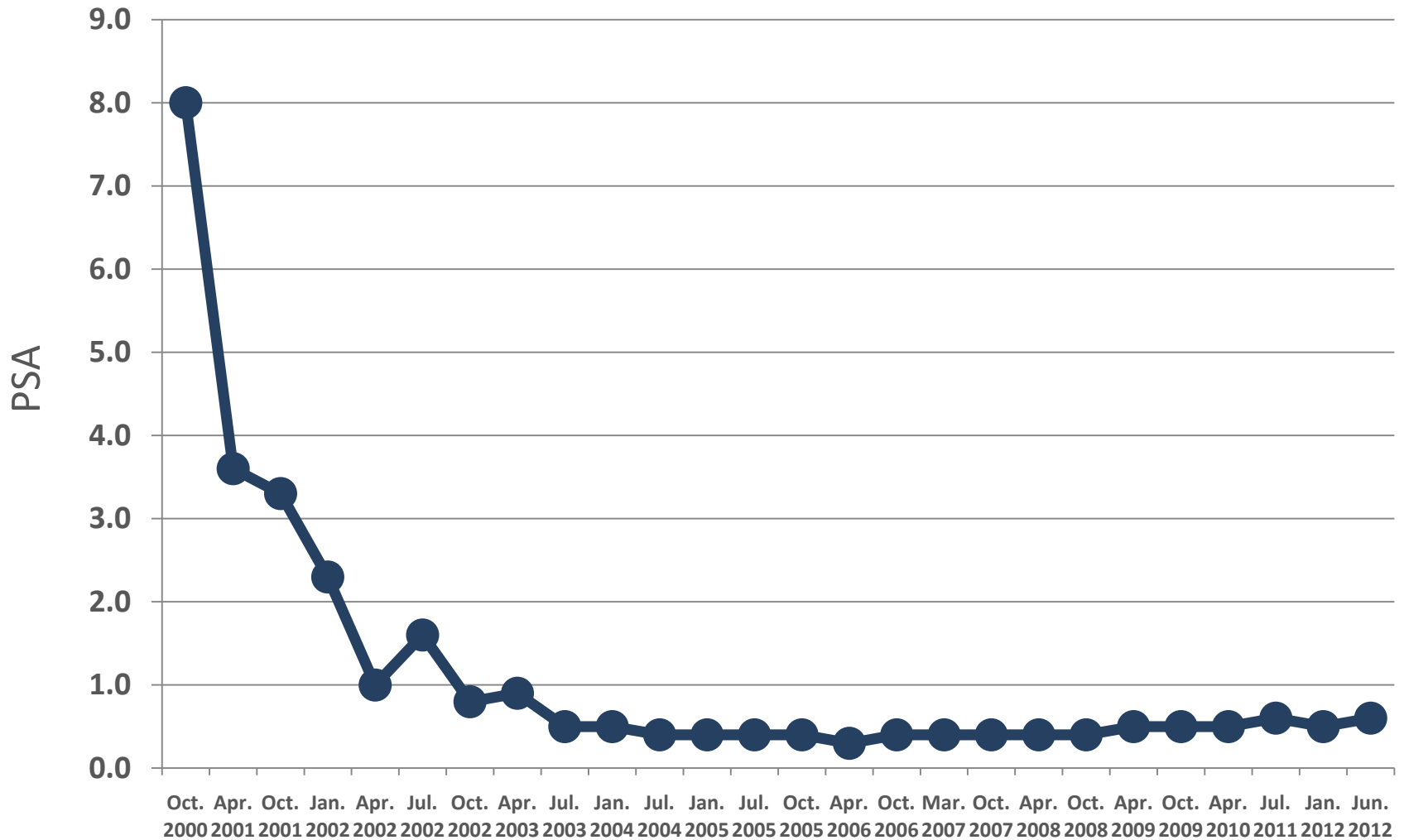


My Story

- Older brother had PCa—chose surgery
- My PSA was rising—3 biopsies/diagnosed 2000
- The more research . . . the more confused
 - “Poster boy” for surgery, seeds, EBRT, Cryo
- **Patient interviews** provided answers
- Chose advanced form of radiotherapy (proton)
 - Urologist vehemently opposed
 - Painless, non-invasive, no side effects
 - 2 months in CA
- Results beyond my expectations



My PSA Trend





A photo of me, undergoing treatment ...



What friends back home thought I was going through ...



But here's what I was really doing ...

Questions

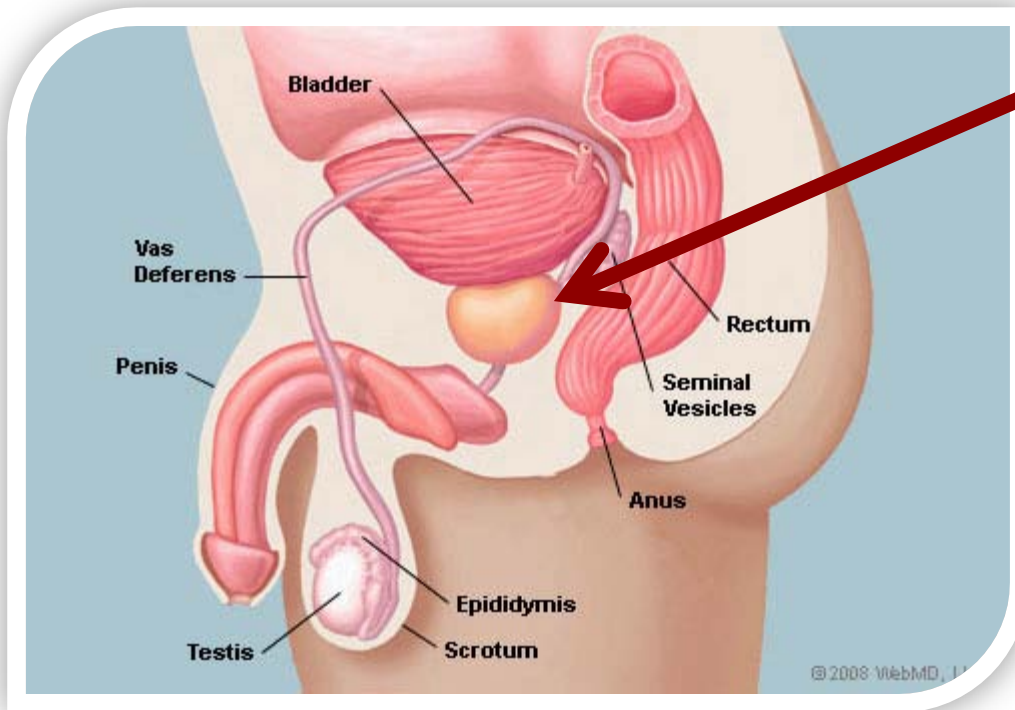
- What and where is the prostate and what is its function?
- What 2 important screening tests should all men have annually?
- How is prostate cancer detected?
- What are the treatment options?
- How can prostate cancer be prevented?
- What role should **you** play in all this?



The Prostate

Function:

To provide fluid which activates sperm to make semen



Prostate

size of prostate



PSA Test

PSA is a protein produced by the prostate. It is also produced by prostate cancer cells.

- **PSA test measures the level of PSA in the blood**
- **“Normal” range is 0 - 4 ng/ml**

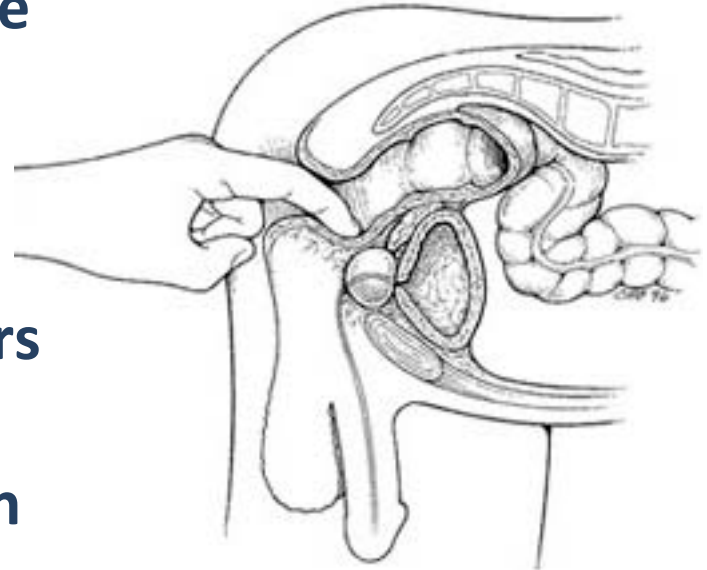


PSA Facts

- PSA can be elevated due to **cancer ... or benign conditions** (BPH, infections, etc.).
- PSA rises slowly with age & prostate size (BPH).
- **Any prostate stimulation can elevate PSA.**
- High PSA does not mean you **have** PCa.
- Low PSA does not mean you **do not** have PCa.
- High PSA or rapidly rising PSA points to a **higher probability** of prostate cancer.
- Elevated PSA, and **especially rising PSA** should always be taken seriously (rapid rise, **even in normal range**, is red flag).
- **Doctors vary in their response to high PSA or rising PSA.**

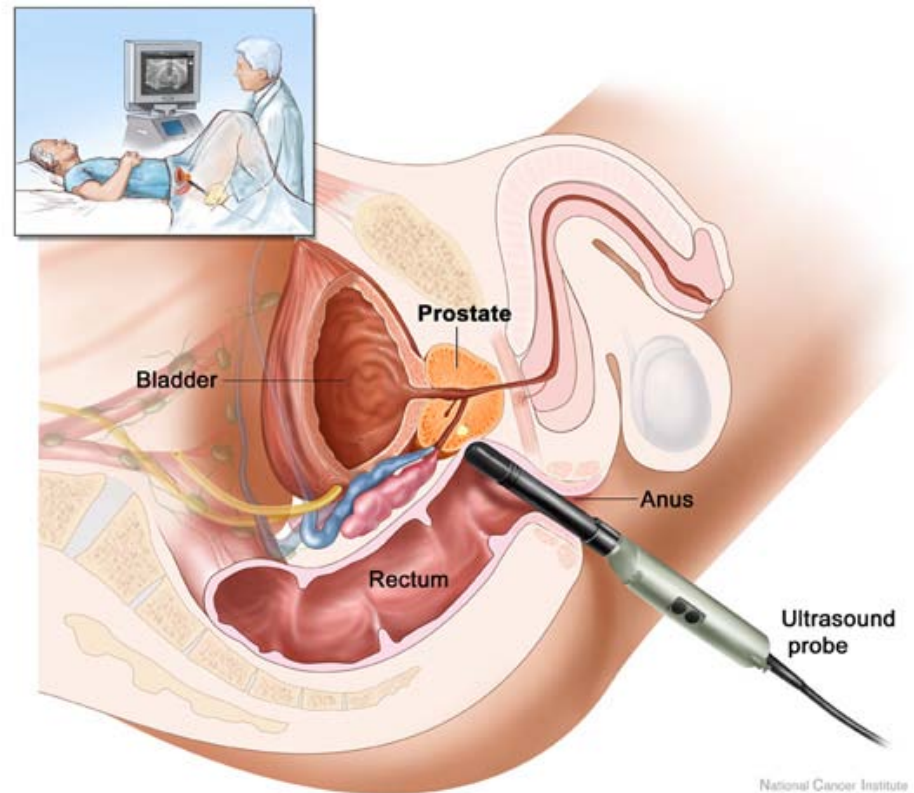
Digital Rectal Exam (DRE)

- Doctor inserts gloved finger into rectum to feel the prostate gland through the rectal wall.
- A lump or abnormality raises **suspicion** of cancer.
- Early stage, microscopic cancers **cannot** be felt by DRE.
- DRE is used in conjunction with PSA test to determine if a biopsy is called for.



Prostate Biopsy

- Ultrasound probe inserted in rectum to provide image
- Hollow needle inserted to remove tissue samples
- Samples examined under microscope
- Given “grading score” if cancer present
- **Note 1: More samples, better chance of finding early stage cancer**
- **Note 2: Not painful with local anesthesia**



Staging and Grading Prostate Cancer

- Gleason Score – scale 5 to 10
- TNM Staging
 - T1 – T4 (Re/ Tumor lumps)
 - Nx – N3 (Re/ Lymph Node)
 - M0 – M1 (Re/ Metastasis)
- My cancer: PSA 8, Gleason score 6, T1c Nx Mo
- **Key Point: Get 2nd opinion on Gleason Score**



Treatment Options: 3+ Major Categories

1. Radical Prostatectomy
(surgery), incl. laparoscopic

2. Radiation
(several types)

3. Cryosurgery

Cut it, cook it, freeze it

4. Active surveillance is growing in popularity

Other

Hormones, chemotherapy, HIFU, alternative medicine, and others...



1. Radical Prostatectomy (Surgery)

“The Gold Standard”

- Major surgery . . . 8 - 12 week recovery
- Benefit: organ confined disease cured
- **Extremely** practitioner dependant
- Common side effects
 - Impotence, incontinence, infection, strictures
- Generally limited to “younger” men
- Recently Laparoscopic RP introduced
 - Less intrusive, quicker recovery . . . but comparable side effects



2. External Beam Radiation Therapy (EBRT)

X-Rays (Photon Radiation)

- Painless, non-invasive
- Comparable to surgery in cure rate
- Requires 8 - 9 weeks of treatment
- Possible side effects:
 - Impotence, incontinence, strictures, rectal injury, secondary cancers

IMRT (Intensity Modulated Radiation Therapy)

- Multiple X-Ray beams of varying intensity
- More precise, side effects reported to be less severe
- Other forms: CyberKnife, TomoTherapy, RapidArc, Calypso

2. Brachytherapy (seed implants)

“Internal” Radiation

- Placement of 80-125 radioactive seeds in prostate
- Marginally invasive
- Quick procedure with short recovery time
- **Extremely** practitioner dependant
- Possible side effects
 - Impotence, incontinence, strictures, rectal injury
- Restrictions around pregnant women & children
- Radioactive seeds stay behind, migration common
- Newer HDR is available



3.

Cryosurgery

- **Freezes the cancer with liquid nitrogen**
- **Relatively new**
 - Growing in use as salvage treatment
- **Marginally invasive**
- **Practitioner dependant**
- **Possible side effects**
 - Impotence, incontinence, urinary complications



4. Active Surveillance

No real consensus, but generally:

- PSA < 10
- Slow PSA velocity
- Stage T2a or less
- Gleason Score 6 or lower
- Small % of cancer in each core
- Age 70 or older

And ... *monitor closely.*



Hormonal Therapy

Also known as Hormone Ablation Therapy (HAT) or Androgen Deprivation Therapy (ADT)

- Uses drugs to prevent testosterone production
- Does not “kill” cancer—slows down growth
- Occasionally used with other treatments
- Often used when other options fail
- Possible temporary side effects
 - Impotence, hot flashes, fatigue, breast enlargement



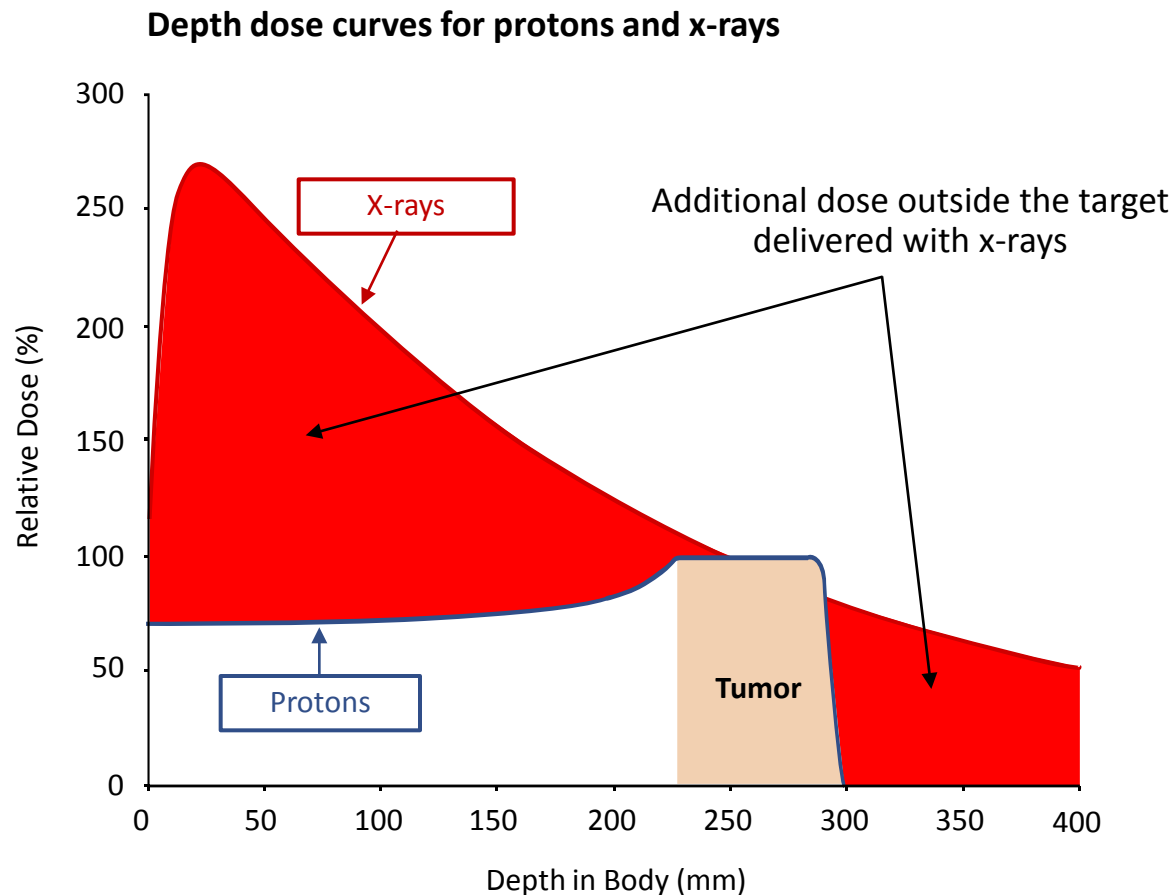
Proton Treatment

- A form of **advanced** external beam radiation
- Uses proton particle (Bragg peak)
 - Permits precision targeting
- Painless & non-invasive, 8–9 weeks
- Cure rates **at least** comparable to other options
- Not practitioner dependant
- Potential side effects
 - Changes in potency, minor rectal injury
- **Less** collateral damage, *significantly fewer side effects*



The Physics of Protons

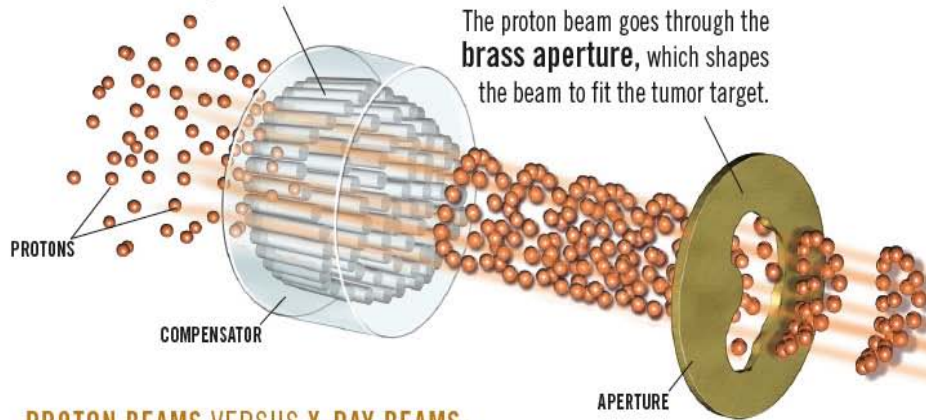
In order to deliver the same dose to the tumor, x-rays *must* deliver a greater dose to healthy tissue



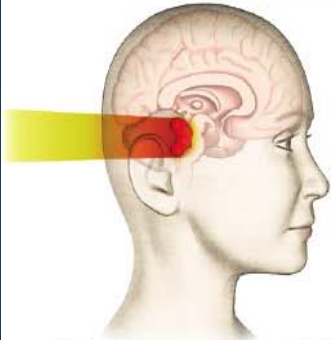
DEPTH CONTROL

The impressive difference between **proton beam** and X-ray therapy is the ability to control how deep the proton beam must travel to reach the tumor and deposit its energy. The precision of proton beam therapy is particularly beneficial in treating childhood cancers, such as medulloblastoma shown here, to prevent damage to developing healthy tissue.

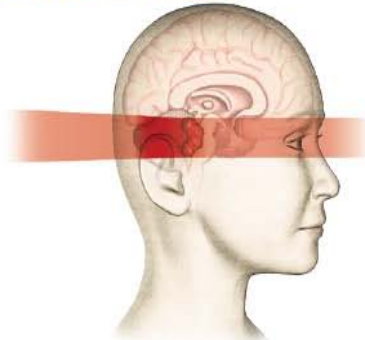
The **compensator** controls how far the proton beam needs to travel before reaching the tumor.



PROTON BEAMS VERSUS X-RAY BEAMS:



Proton beams can be controlled to deposit the bulk of their energy, known as the Bragg peak, at the exact tumor location.



The depth of **X-ray beams**, on the other hand, cannot be controlled. They enter the body and almost immediately reach the maximum dose followed by a gradual reduction as the beams travel all the way through the body, affecting healthy and cancerous tissue along the way.

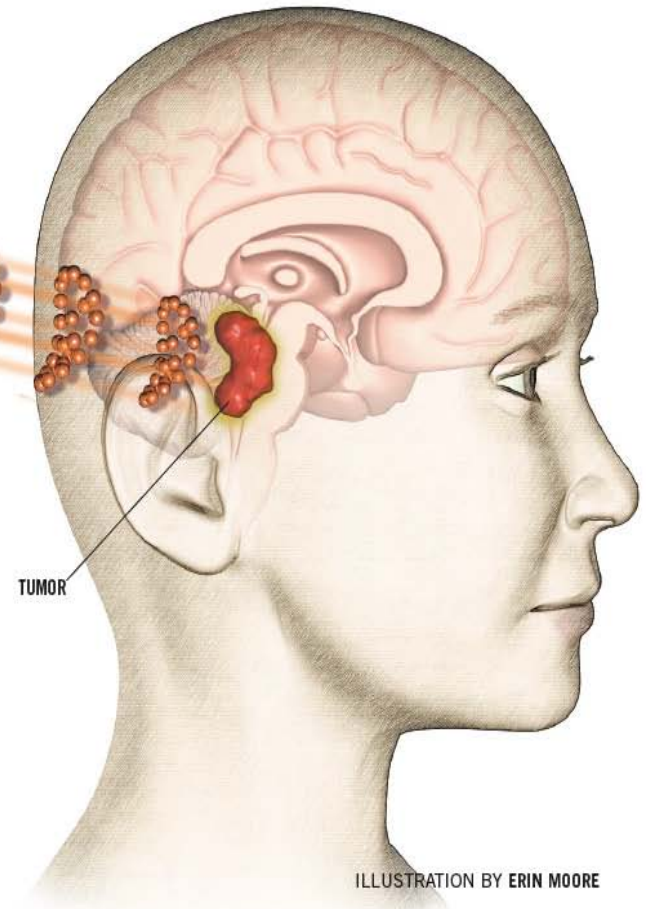
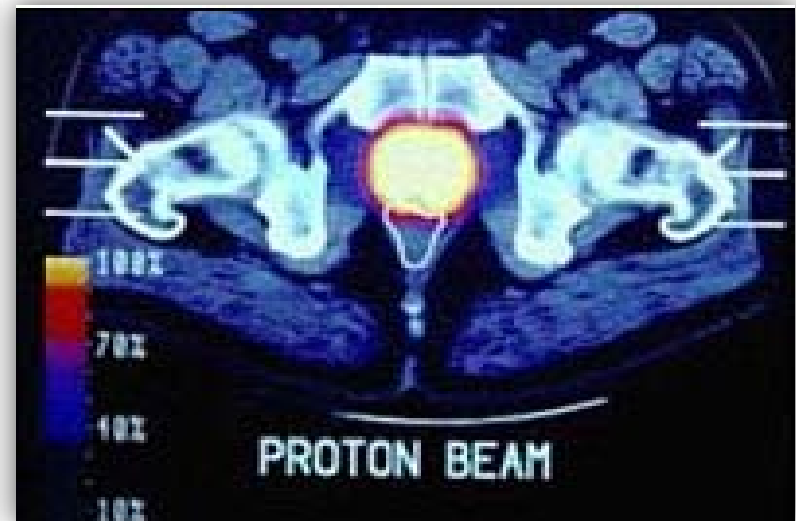
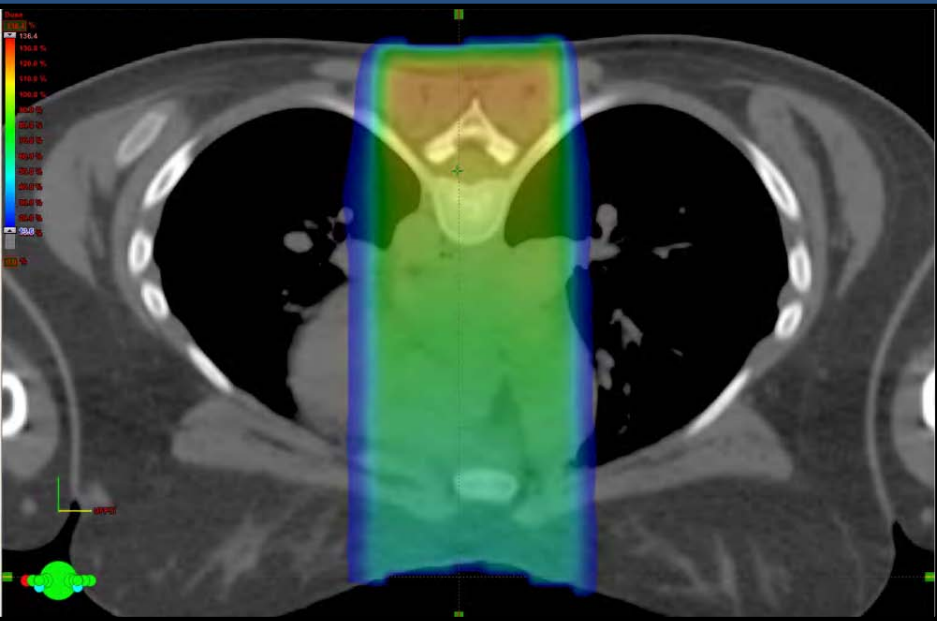
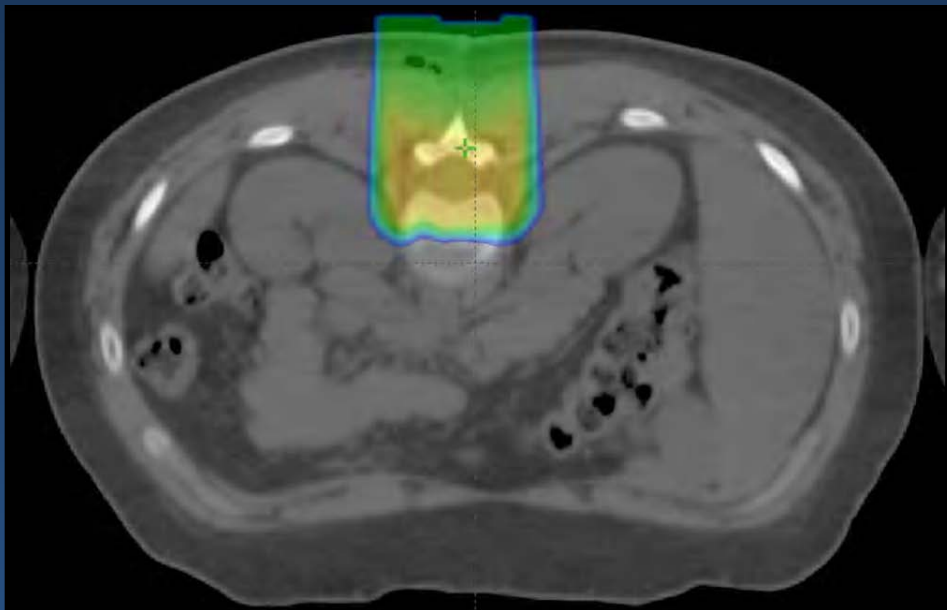
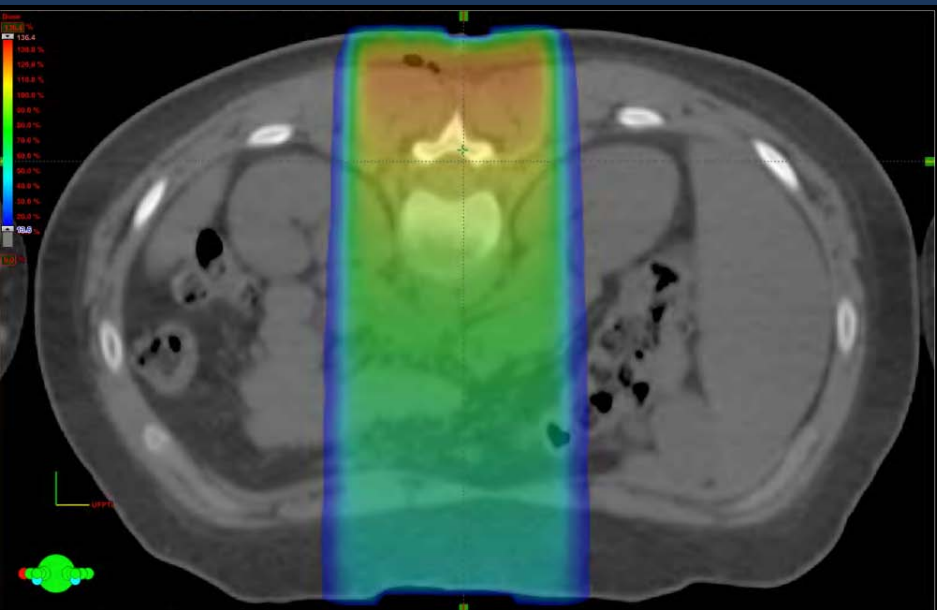


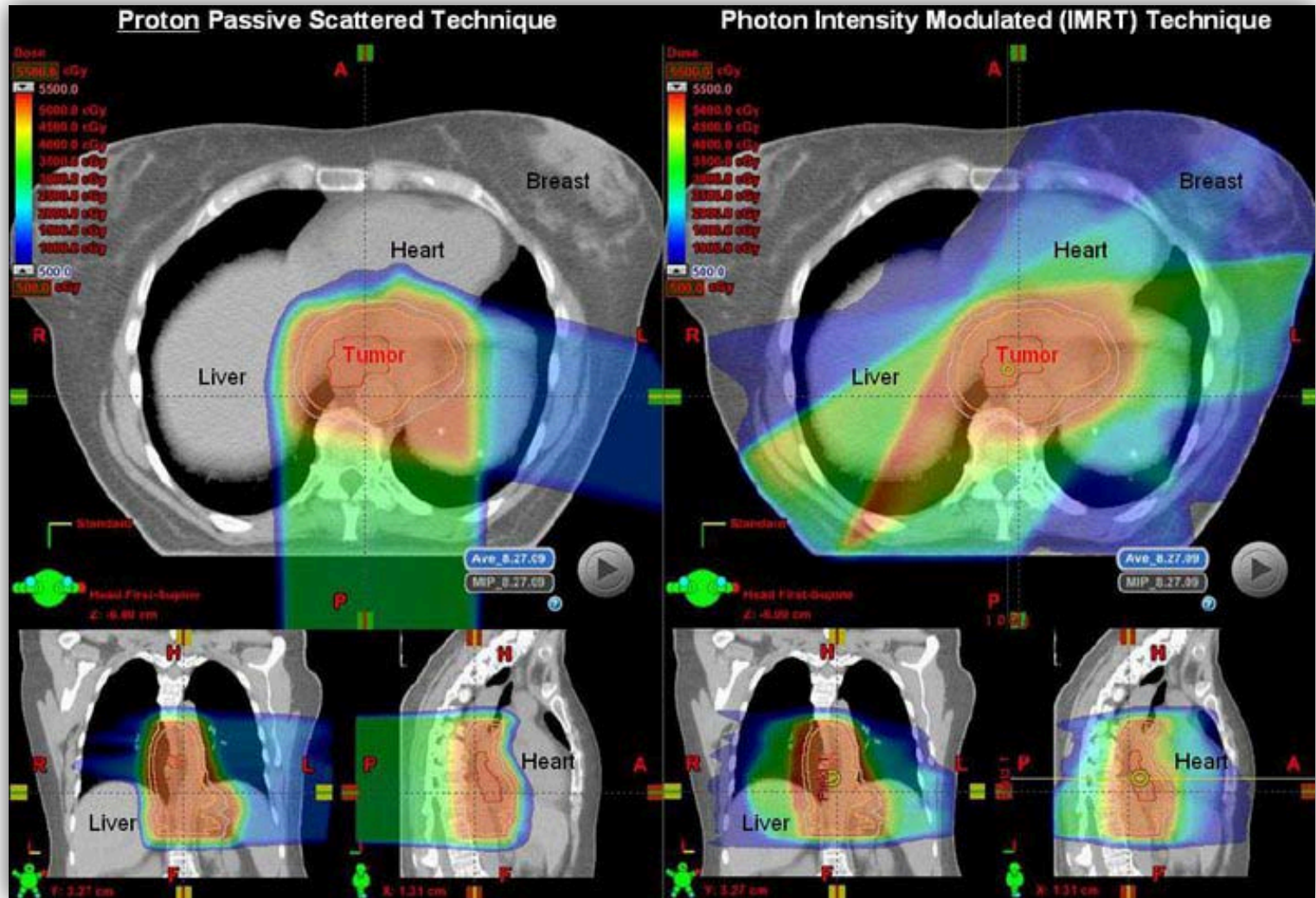
ILLUSTRATION BY ERIN MOORE

Treatment of Prostate Cancer

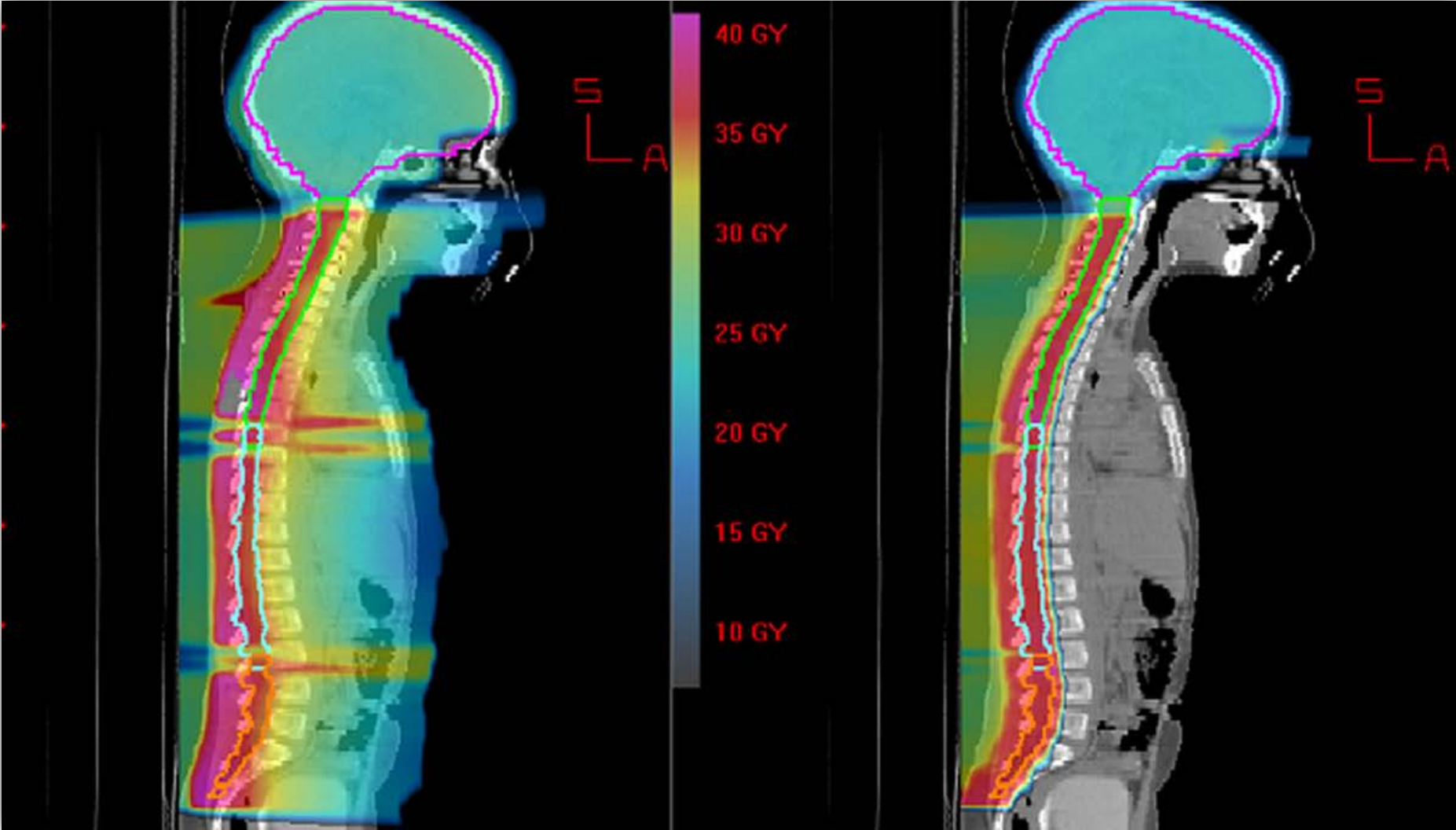




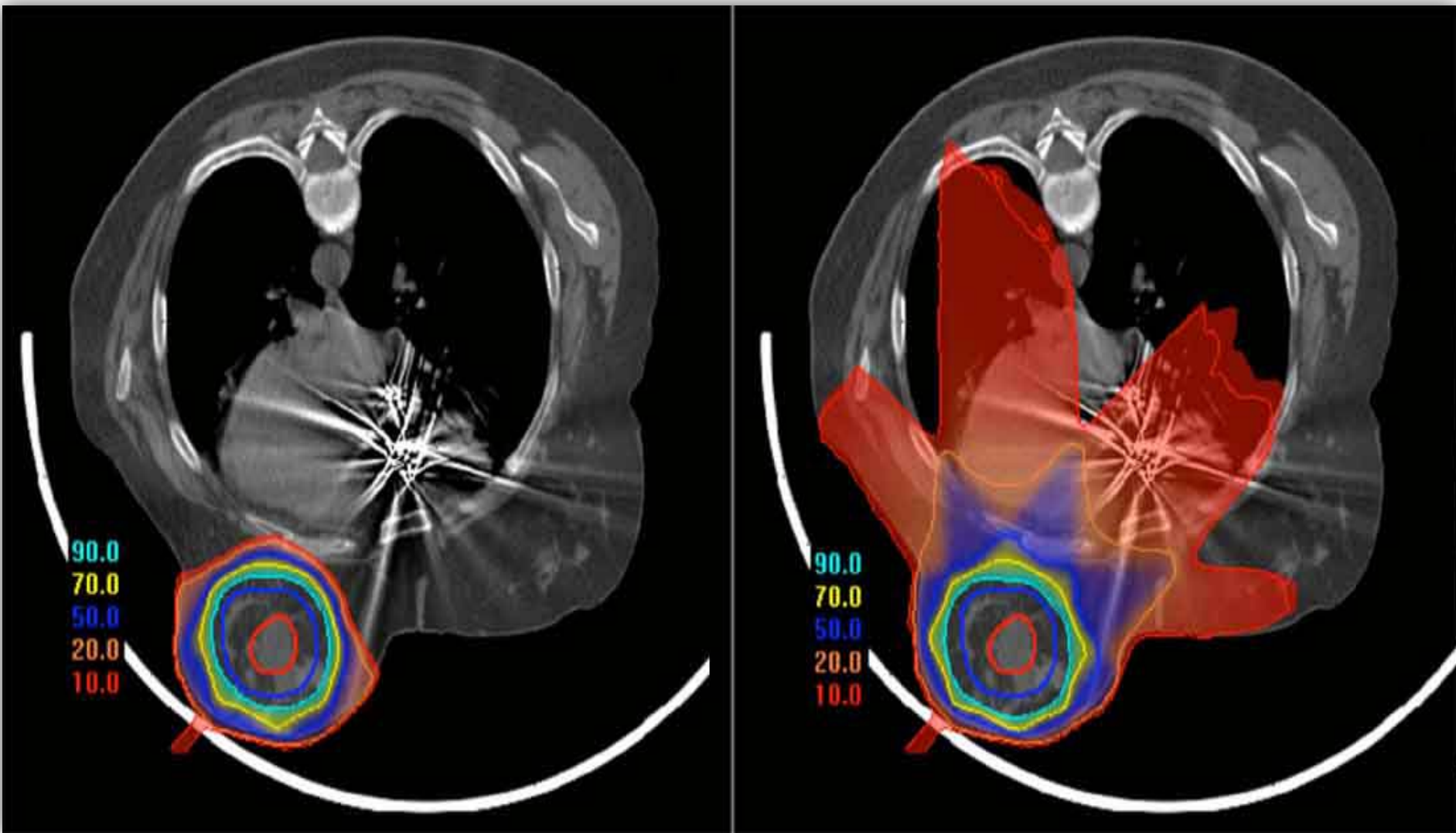
Proton vs. IMRT



Spine Tumor in 3-Year-Old Child



Breast Cancer – Proton vs. IMRT



How Safe are Protons Compared to X-Rays?

Randomized trials	Boost Modality	Planning Technique	High dose arm	5-year control	GI toxicity	
					≥G2	≥G3
MD Anderson	X-rays	2-D/3-D	78.0 Gy	78%	28%	10%
CKVO96-10	X-rays	3-D	78.0 Gy	64%	32%	5%
MRC RT01	X-rays	3-D	74.0 Gy	71%	33%	10%
PROG 95-09	Protons	3-D	79.2 Gy	92%	17%	1%

Protons offer a **lower complication rate** than conventional X-rays.



How Effective are Protons compared to IMRT?

Study	Radiation	Planning	Dose	Control for Favorable Risk Patients
PROG 95-09	Protons	3-D	79.2 Gy	93% (10 year)
MSK	IMRT	3-D	81.0 Gy	85% (8 year)



Protons offer control **at least as good as IMRT** for low risk prostate cancer.

Risk of Secondary Malignancies

Study from MD Anderson Cancer Center (*IJROBP 2009*)

MGH Study showed patients treated with protons *alone* had **zero** secondary malignancies.



Sexual Function

- 3 published studies show testosterone suppression with **photon (X-ray)** prostate treatment
- UFPTI study published March 2011:
No testosterone suppression with proton treatment



Sexual Function (Cont.)

- **UFPTI study of men 55 & younger**
 - 95% sexually active a year later
 - 94% sexually active 1 ½ years later
- **According to a BMJ and JAMA:**
 - 60 to 80% impotent after surgery



Surgery Results?

From Johns Hopkins Study: 5,096 patients

“Approximately 35% of patients will develop a prostate-specific antigen (PSA) recurrence within 10 years after surgery.”

- JAMA, July 27, 2005 Vol 294, No. 4

That's only a 65% success rate!



Proton Results?

- **Overall**, 93.2% free from biochemical failure at 5 years.
- **Low risk** patients: 97.8% free from biochemical failure at 5 years.

(Low risk: PSA<10, Gleason score <7, T1, T2)

- JAMA, 2005;294[10]:1233-1239
- JAMA, February 27, 2008-Vol299, No. 8



Proton Results (Cont.)

2014 NAPT Proton Therapy Survey

- National Association for Proton Therapy (NAPT) commissioned Dobson DaVanzo & Assoc. (healthcare consulting firm) to investigate clinical outcomes/patient satisfaction among men treated with proton therapy for prostate cancer
- Survey instruments used: APECC, CAHPS, AHRQ and EPIC
- Designed to capture info about disease-free survival and quality of life outcomes



Proton Results (Cont.)

2014 NAPT Proton Therapy Survey

- Large response—nearly 4,000 from 12 proton centers
- Represents 17% of all patients who received proton for PCa over 24 years
- Almost 70% college grads (indicates more highly educated men seem to research treatment options)
- 98% believed they made best treatment decision
- 96% have recommended proton to others
- 98% rated experience as “excellent” (88%) or “good” (58%)



Proton Results (Cont.)

2014 NAAPT Proton Therapy Survey

- 96% were “satisfied” (15%) or “extremely satisfied” (81%) with treatment
- 85% reported quality of life was “better than” (27%) or “same as” (58%) than before treatment
- Patients who received proton only (no additional photon or hormones) reported urinary, bowel, and sexual function outcomes consistent with a cancer-free control group that *never* had any treatment for prostate cancer
- **97% reported no recurrence of their cancer**



Proton Results (Cont.)

2013 BOB Member Survey

- Conducted survey of BOB membership—EPIC format
- Patient reported data
- Data analyzed by team of best radiation oncologists/scientists
- Compared to men never treated—control group
- Results profoundly positive
 - No difference in urinary or rectal/bowel function
 - Some difference in sexual function (HT, older, advanced cancers)



Proton Results (Cont.)

2009 BOB Member Survey

- Patient reported data
- 99% said they made the best decision
- 98% have recommended proton to others
- 96% reported cancer was in remission
 - Some said, “too early to tell”
- 97% reported their treatment experience as “outstanding”
- Minimal to no urinary or bowel issues
- 4% reported ED: Remainder had minimal to no changes in sexual function

Proton Results (Cont.)

2013 BOB Member Survey

- 99% said they made the best treatment decision
- 96% were satisfied or extremely satisfied with proton therapy
- 92% reported their quality of life was same as or better than before treatment
- Overall—similar urinary and bowel function to untreated men
- Sexual function for some diminished—mostly hormone therapy or age related

Compare these results to results from patients who chose surgery or conventional radiation!

Proton Results (Cont.)

2014 NAPT Proton Patient Survey Results

- Almost 4,000 former patients responded (from 1 to 24 years post-treatment)
- 98% rated their experience good or excellent
- 98% said they made the best treatment decision
- 96% were satisfied or extremely satisfied
- 85% said the quality of their lives was same as or better than before treatment
- ***97% of proton (only) patients reported they were still disease free.***



Is Proton Treatment New?

- **No. First used in 1954—physics labs**
 - 100,000 patients treated
 - FDA Approved, covered by Medicare & private insurers
- **First hospital-based facility at Loma Linda, CA, 1990**
- **Proton facilities today in US:**
 - CA (2), MA, FL, TX, OK, PA, VA, IL, NJ, WA, TN, MO
 - Many others under construction or planned
- **Several in Asia and Europe**



Is Proton Treatment New? (Cont.)

If proton treatment is so good, why aren't there more proton centers?

- **Cost:** \$150–200 million; large building/staff
- **Higher Cost of Treatment:** But cost is coming down
- **Opposition:** From practitioners of competing technologies

Preventing Prostate Cancer

- No one knows for sure how to prevent PCa
- Heredity and race play a role
- Diet and lifestyle **negative** factors:
 - Red meat, processed meats, dairy products
 - Smoking, excessive alcohol
 - Obesity, inactivity



Preventing Prostate Cancer (Cont.)

- Diet and lifestyle **positive** factors:
 - Vegetables & fruits—especially w/ lycopene
 - Cruciferous vegetables
 - Soybeans, soy milk
 - Beans, lentils, nuts
 - Lower fat diet
 - Exercise



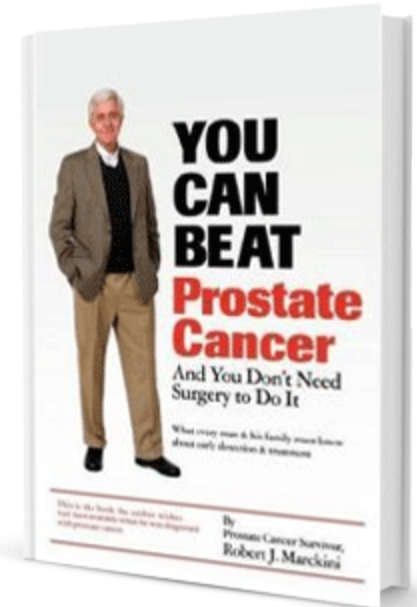
Summary: Preventing Prostate Cancer

- **Weigh what you ought to weigh**
- **Exercise regularly**
- **Eat smart**
 - Less food (calories) overall
 - Less animal products
 - More soy
 - More plant foods
 - Foods containing lycopene
- **Choose different parents**



You Can Beat Prostate Cancer And You Don't Need Surgery To Do It

- The book I wish had been available
- Preventing PCa, recurrence, slow progression
- Take control of the diagnosis
- Pros & cons of each treatment option
- My personal journey and what I learned along the way
- Includes the **ten steps for taking control of the detection and treatment of prostate cancer**



You Can Beat Prostate Cancer And You Don't Need Surgery To Do It

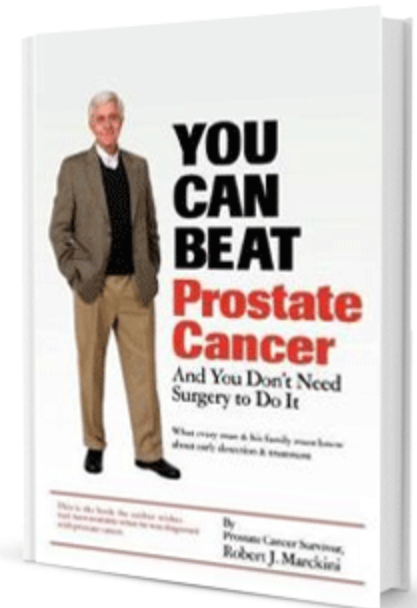
Endorsed by

NAPT, NewsUSA, U. Penn, UF, LLU,
ProCure, Prominent Physicians, Others

Currently

#1 all-time best seller at Lulu Press

#3 out of 33,000 on Amazon (search for
“prostate cancer” books and products)



Most Important Message

Take control of your prostate health!

- Live a healthy lifestyle (diet, exercise, weight)
- Have PSA test and DRE annually
- **Track your own PSA** (0.75 change is red flag)
- Manage your biopsy
- If diagnosed, do your homework
 - Get multiple opinions
 - Talk with former patients



To learn more about proton therapy, visit:

Protonbob.com

Protonblog.com

Facebook.com/protonbob

Or send an e-mail to: DHickey@protonbob.com

And read . . . **“You Can Beat Prostate Cancer”**



Questions?