

Radiation Oncology: Integrating “High Tech” with “High Touch”



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Herndon Chair in Oncology Research

HFHS RadOnc Pledge:

“To optimally combine,
in a caring and compassionate setting,
cutting-edge radiation technology with
novel systemic or biologic strategies
to achieve the highest quantity and
quality of life for each individual patient”

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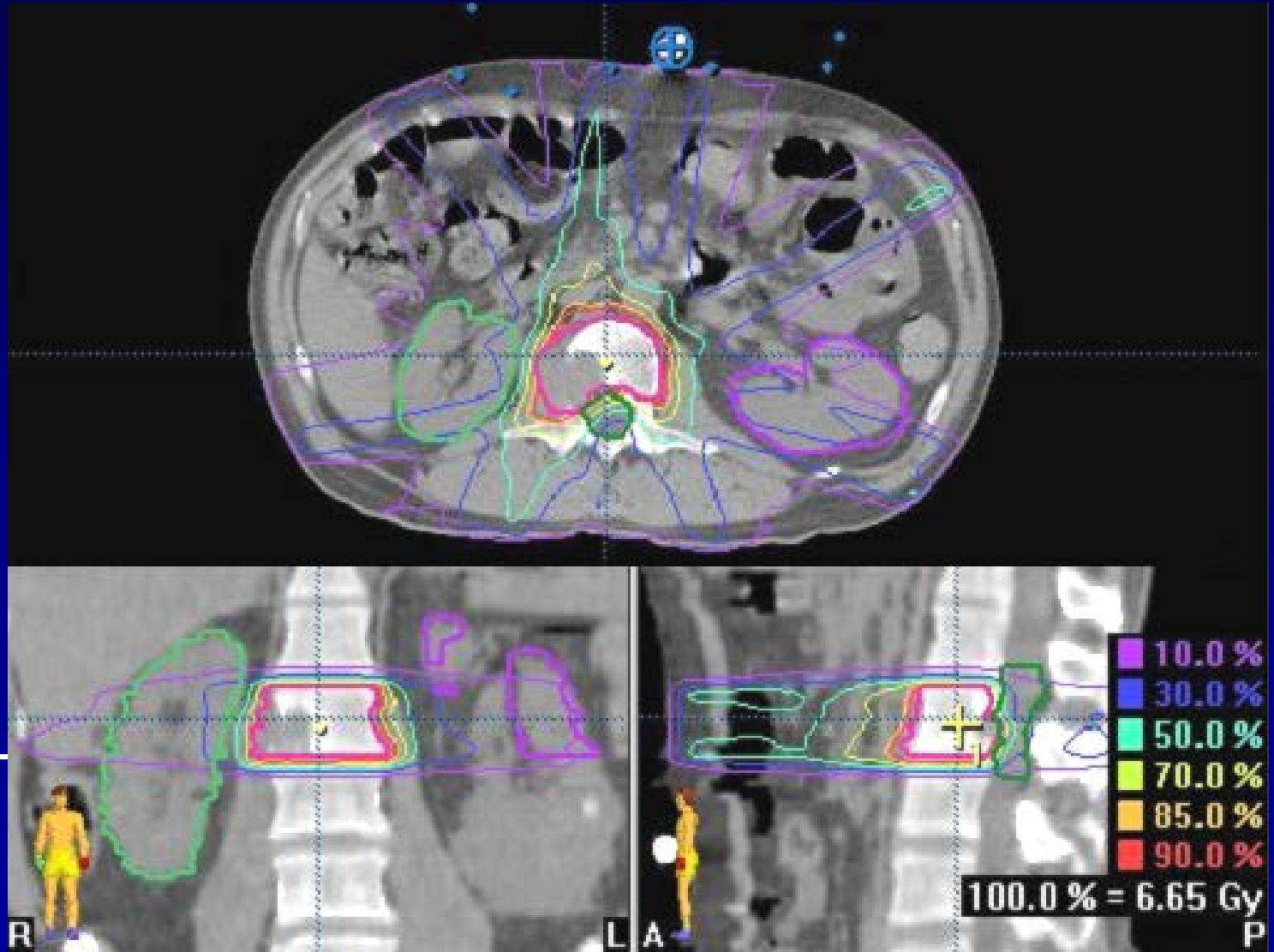
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Cutting-edge RT

- We've treated >4500 patients with stereotactic RT and >1800 with spine SRS
(great example of close collaboration bwn neurosurg, neuro-onc and radonc)

Radisurgery of Spine Metastasis



Cutting-edge RT

-5 years ago, spine SRS was being tested in early phase I (safety) studies

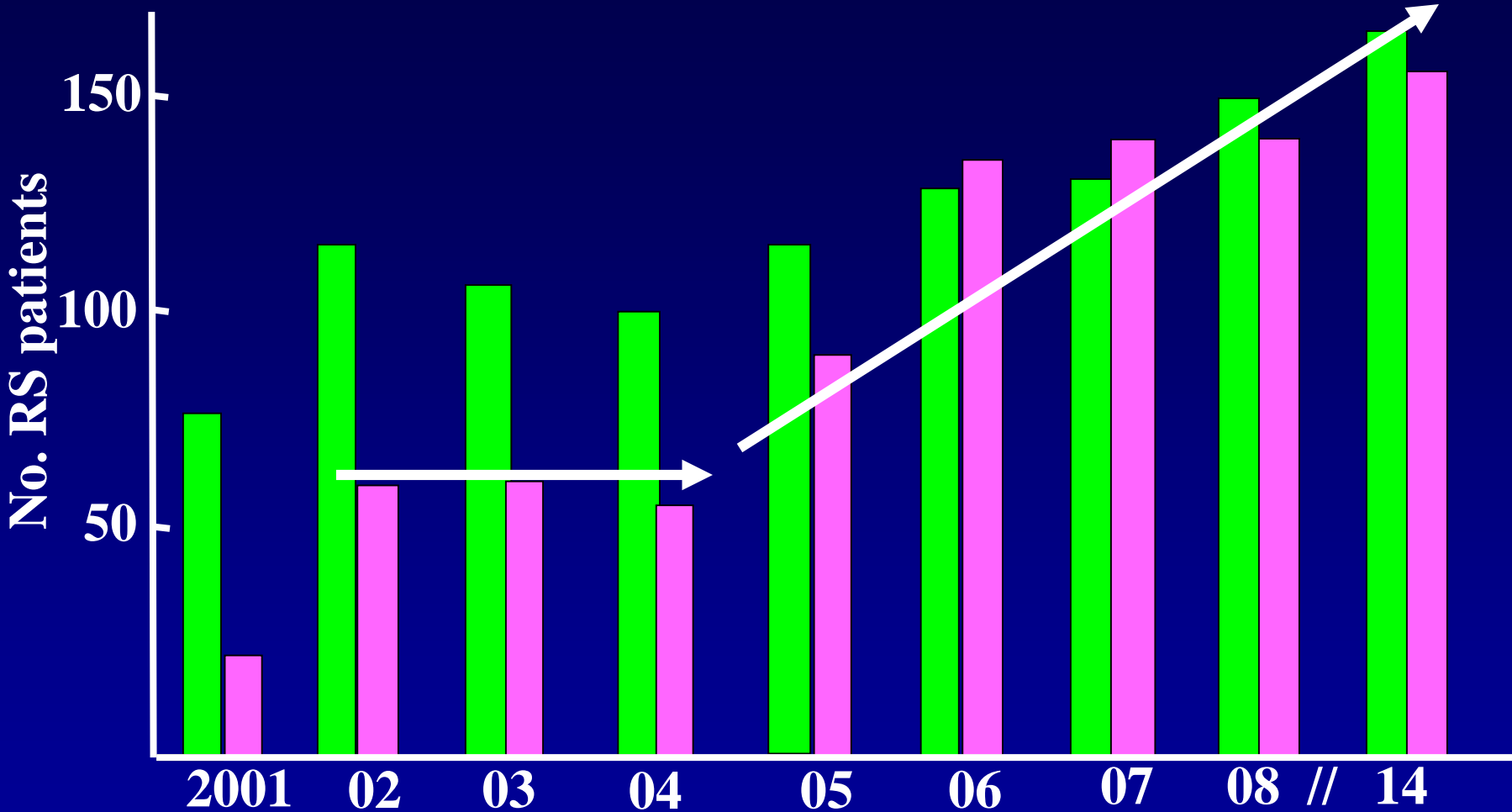
Cutting-edge RT: National Role

-5 years ago, spine SRS was being tested here in early phase I (safety) studies

-Now, a national randomized phase III landmark study has been opened by the NCI to test spine SRS vs. standard RT

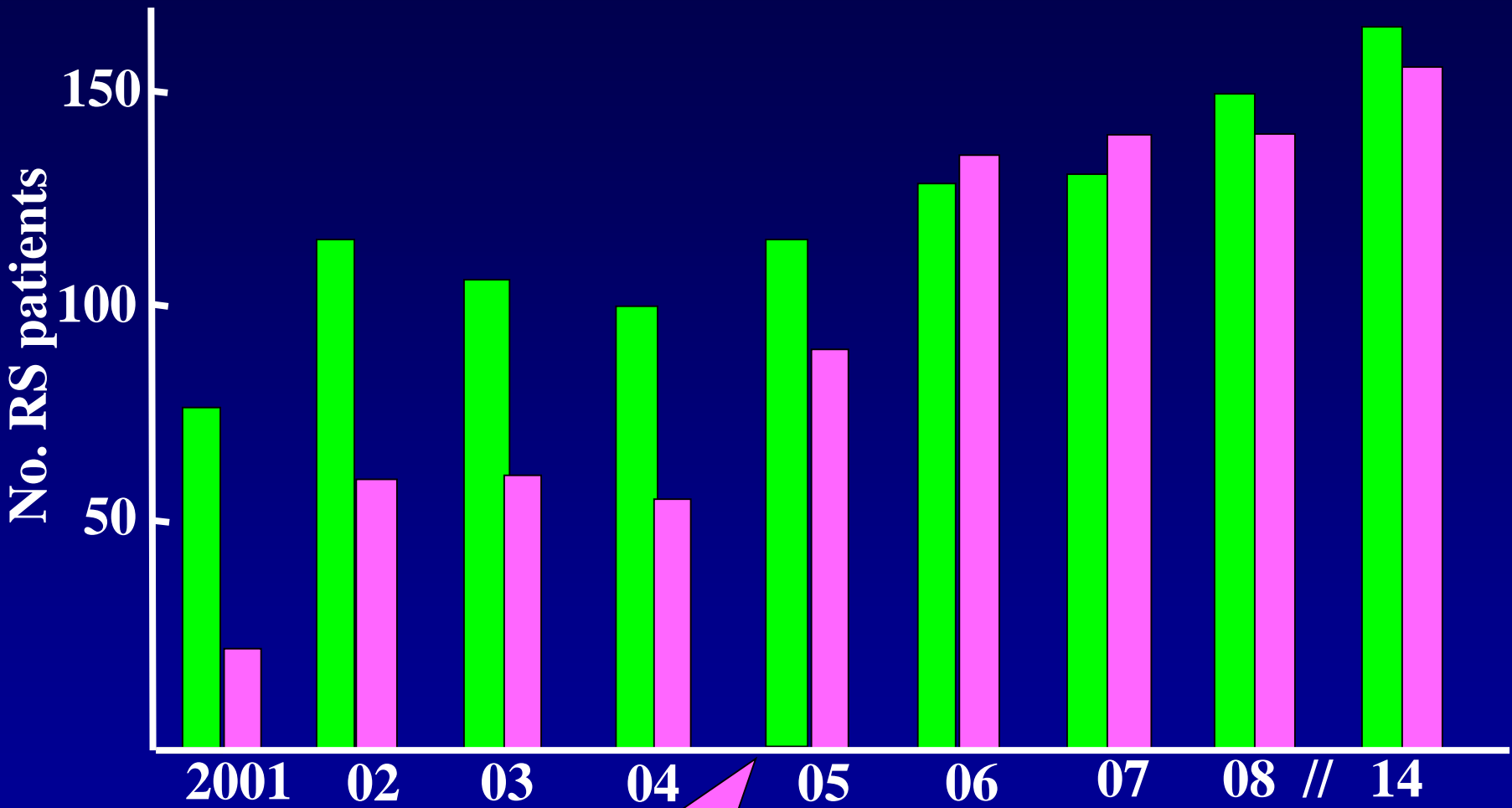
HFH Radiosurgery

Brain
Spine



HFH Radiosurgery

Brain
Spine



Spine Tumor Board

Neurosurgery

Orthopedics

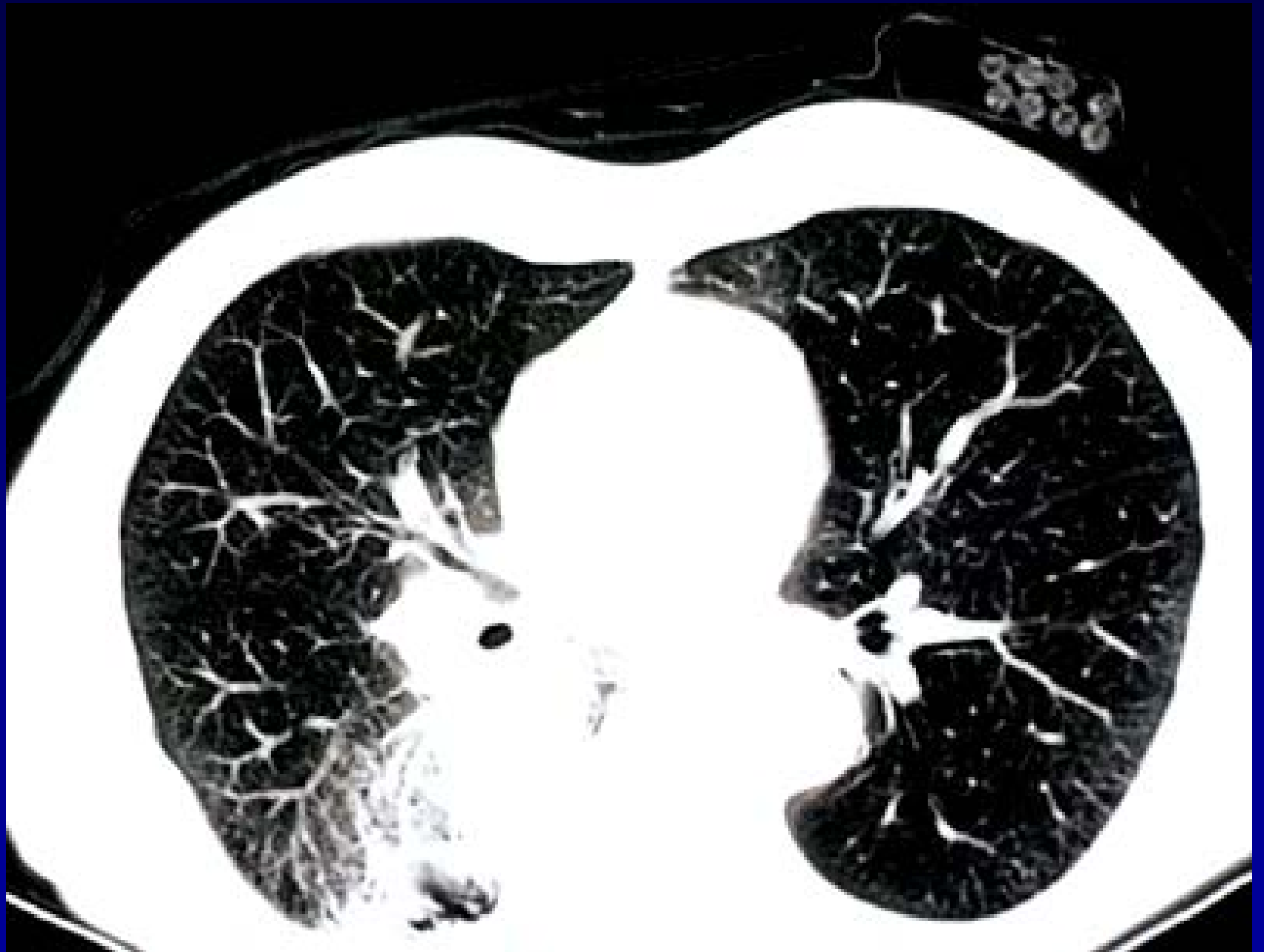
MedOnc

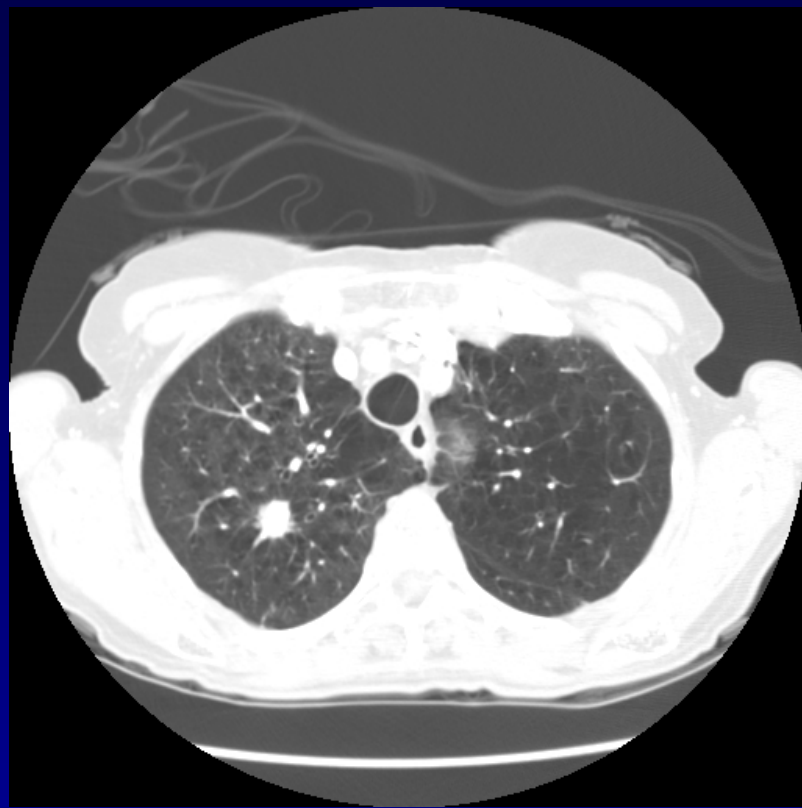
**Spine Radiosurgery
Multidisciplinary
Tumor Board**

Neuroradiology

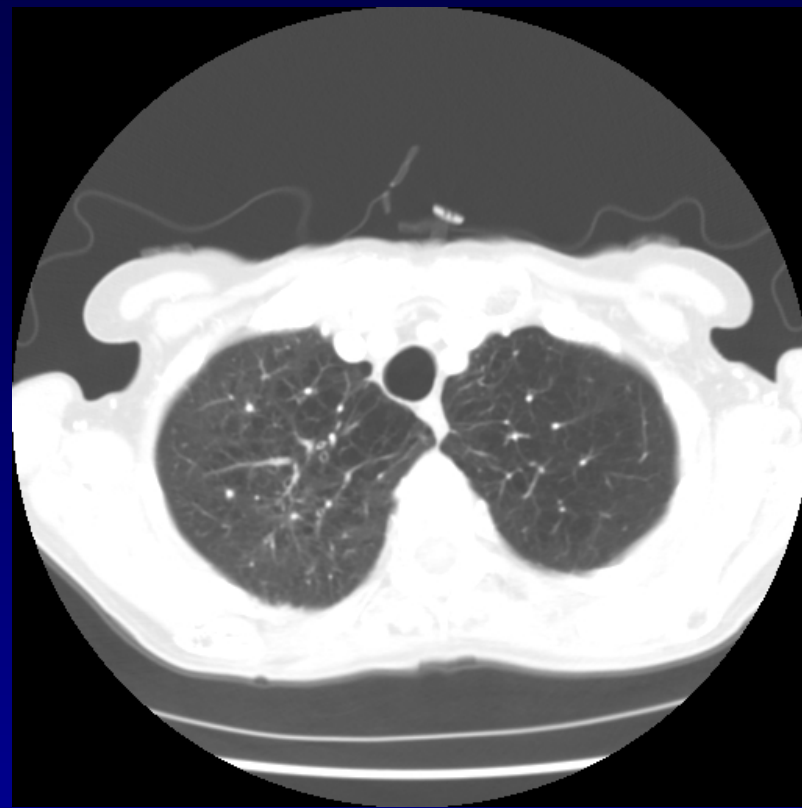
Pathology

Radiation Oncology





SRT
1 yr
later



Tumor Control Rate

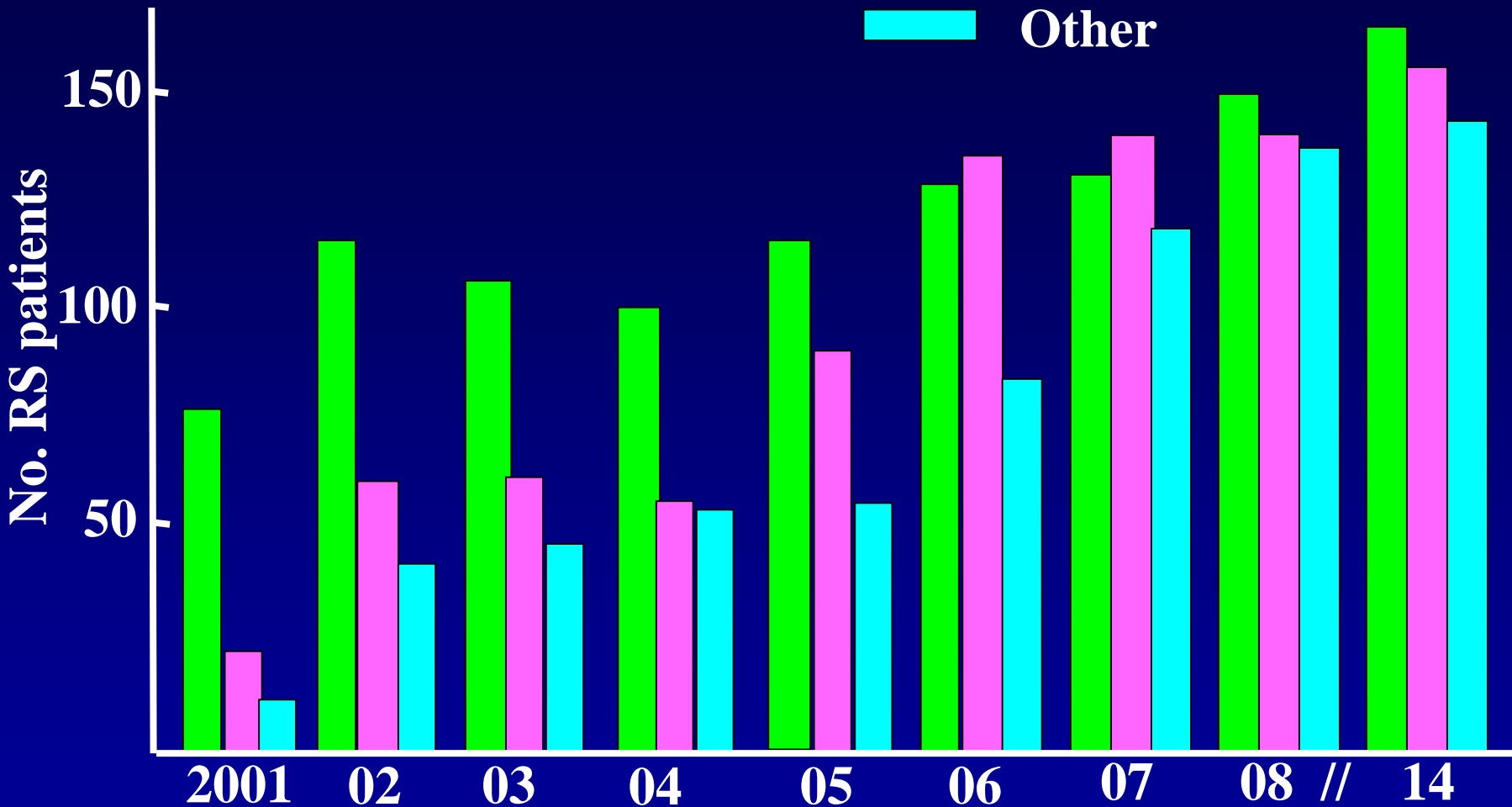
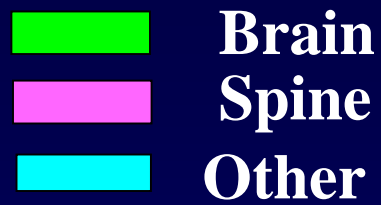
Stereotactic RT (4 days):

>90%

Standard RT (7 wks):

40%

HFH Radiosurgery



Novel Technologies!

We now have the very first dedicated Varian stereotactic unit in North America.....

the EDGE.....right here at.....





Henry Ford Hospital

Novel Technologies!

- Dedicated SRS unit (fully integrated)
- Treats SRS more rapidly (high intensity mode allows up to 2400 MU per minute!) so we can treat in 15-20 min (rather than taking > 1 hour!)
- Pioneering technology (taught by us in SRS course)





The Edge

- We have had site visits from Harvard, Cleveland Clinic, and many others
- Edge course was very well received!
"Really great 'hands on' course"







Thanks to Herman Moore for joining us in the Game on Cancer!



The Edge

- So far, have treated >400 patients on Edge
- The breakdown of tumor sites treated with SRS/SBRT techniques were brain (31%), lung (29%), spine (23%), GI (9%), adrenal glands (7%), and other.



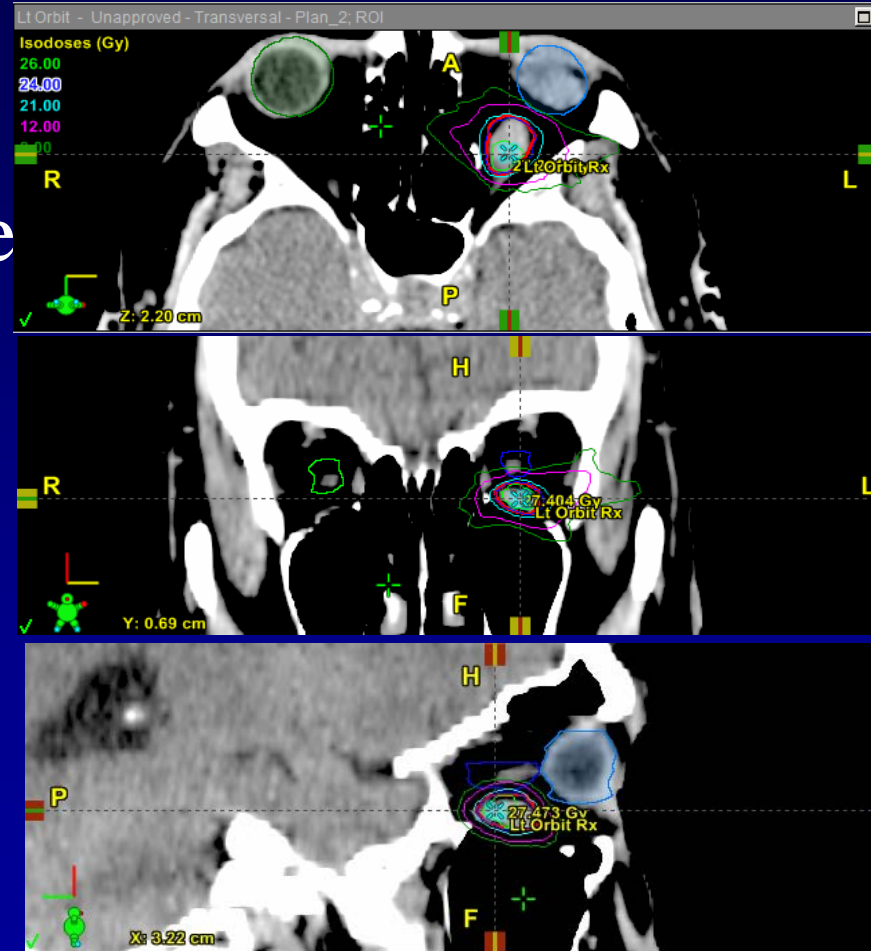
We have been pioneers of stereotactic radiation
and have noninvasively treated tumors
anywhere in the body (brain, spine, HN, lung, abdomen, etc)

In today's health care environment, it's critical to note that with
such a SRS unit, one can accurately treat the 98% of what a
proton center can at 2% of the cost of a proton unit.

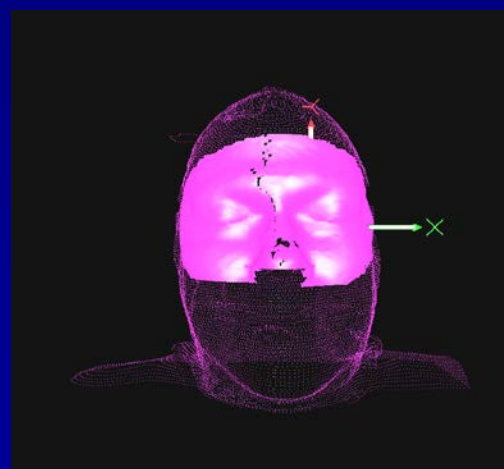
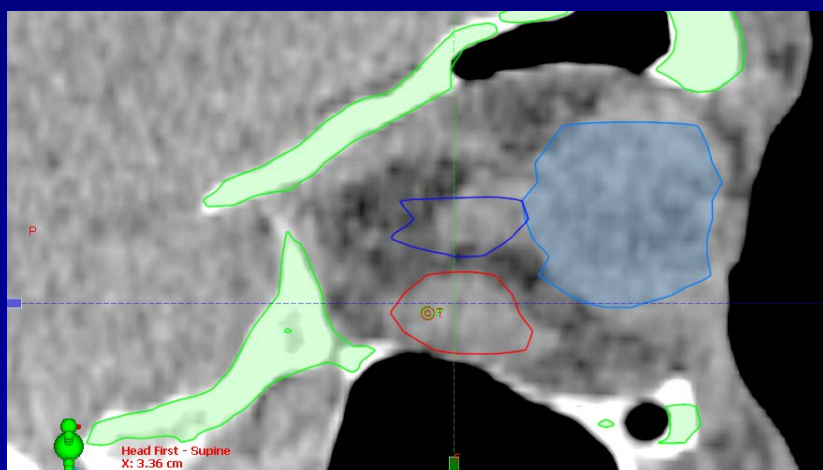
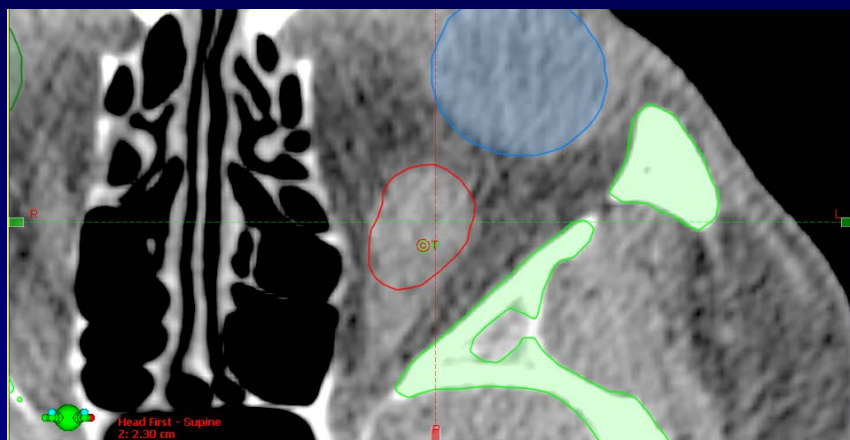


A Case Study

- 63 year old male
- stage IV neuroendocrine carcinoma
- Orbital met
- Prescription: 8 Gy x3
- 7 noncoplanar fields

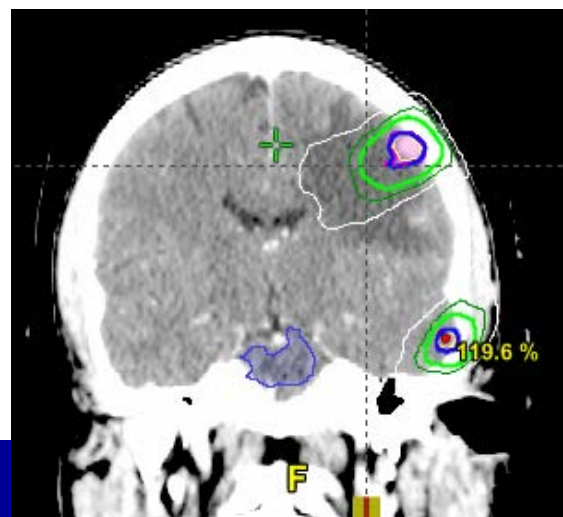
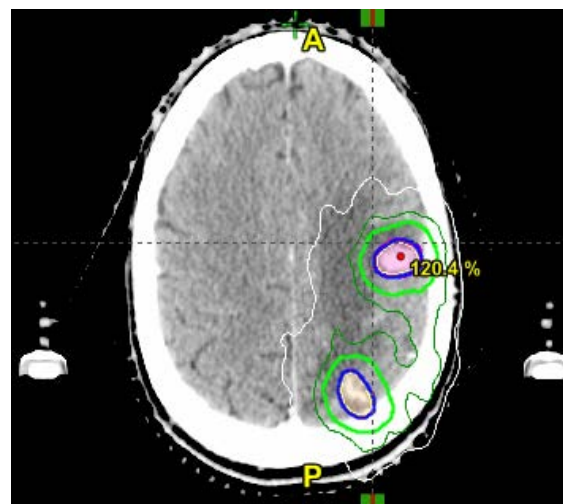


CBCT Localization



Case Study: Single Isocenter Multiple Brain Mets

- 46 year old male
- High grade metastatic bladder cancer
- Three mets in the left fronto-parietal region
- Prescription: 18 Gy @ 90%
- 3 partial arcs (0° , 30° and 60°)



The Edge

First published manuscripts on the Edge!

N. Wen, H. Li, K. Song, K. Chin, Y. Qin, J. Kim, M. Bellon, M. Gulam, S. Gardner, A. Doemer, S. Devpura, J. Gordon, I.J. Chetty, F. Siddiqui, M. Ajlouni, R. Pompa, **Z. Hammoud, M. Simoff, S. Kalkanis**, B. Movsas, M. Siddiqui, “Characteristics of a novel treatment system for Linear Accelerator–based stereotactic radiosurgery”, J. App. Clin. Med. Phys. Accepted (2015)



The Edge

Manuscripts:

Y. Huang, B. Zhao, I.J. Chetty, S. Brown, J. Gordon, N. Wen, “Targeting Accuracy of Image-Guided Radiosurgery for Intracranial Lesions: A Comparison across Multiple Linear Accelerator Platforms”, Technol. Cancer. Res. Treat. Accepted (2015)

S. Gardner, M. Gulam, K. Song, H. Li, Y. Huang, B. Zhao, Y. Qin, K. Snyder, J. Kim, J. Gordon, N. Wen, I.J. Chetty, "Generation and verification of a TPS couchtop model for a dedicated stereotactic linear accelerator", J. App. Clin. Med. Phys. Accepted (2015)

N. Wen, K. Chin-Snyder, P. Schmelzer, S. Scheib, Y. Qin, K. Song, H. Li, J. Gordon, I.J. Chetty, “Evaluation of the Systematic Accuracy of Cutting Edge Technology for Stereotactic Radiosurgery Treatment”, submitted to Radiother. Oncol. (2015)

QA: Accreditation

- There are 9 sites accredited in Michigan, 5 of which are HFHS sites!!!



Members of ACR National Guidelines

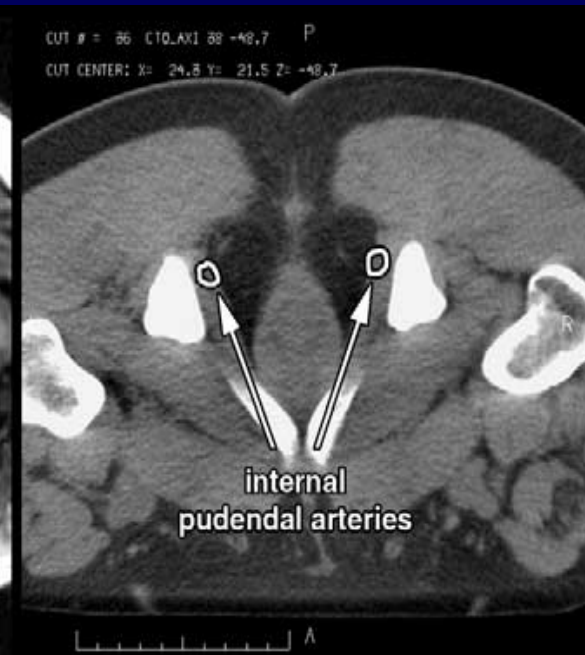
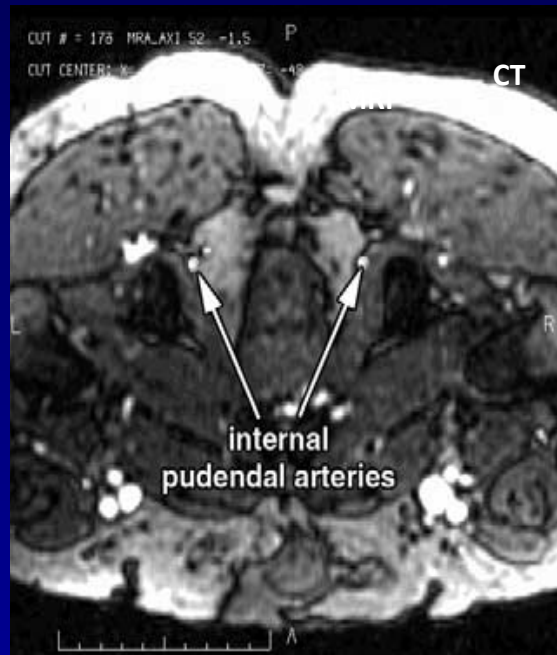
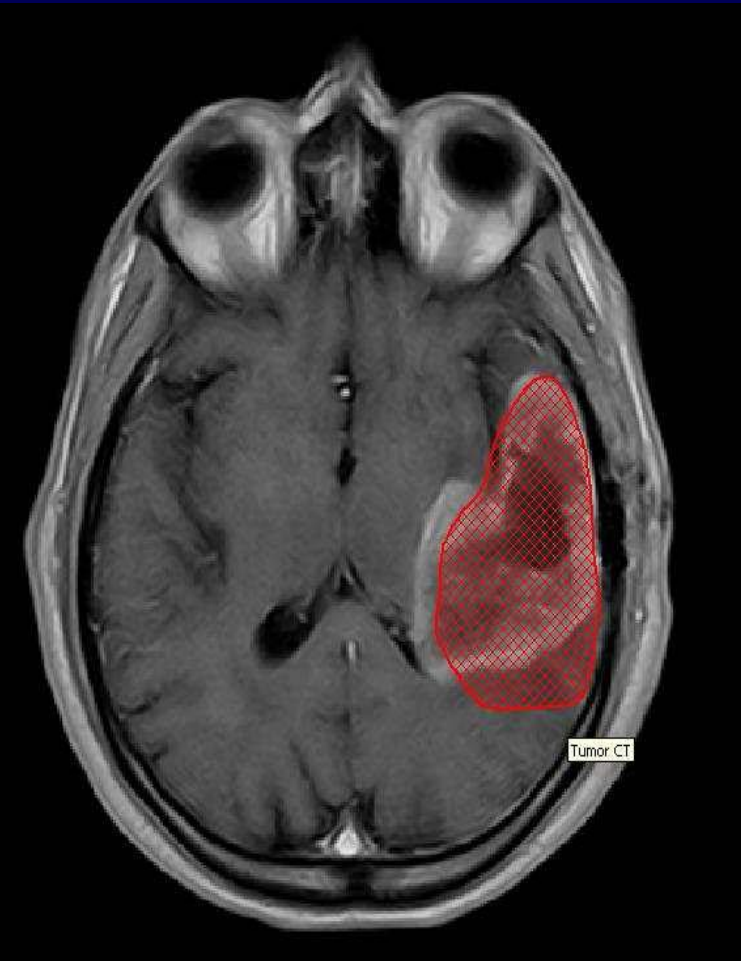
- Dr. Movsas (Chair of ACR Radonc)
- Dr. Elshaikh (Gynonc)
- Dr. Farzan Siddiqui (HN)
- Dr. Salim Siddiqui (Brain)
- Dr. Dragovic (Lymphoma)
- Dr. Walker (Breast)
- Dr. Chetty (Lung)

(MD reviewers for ASTRO also include Dr. Levin and Dr. Pradhan)

Ongoing Project: MRI Simulation

MRI simulation – use of MRI imaging for planning to leverage superior soft tissue contrast—using the open-MR scanner technolog

Magnetic Resonance Imaging (MRI)-Simulation Improved Target definition over CT



CT scanner



**MR scanner on the
“open” technology**



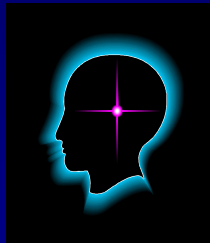


RadOnc Mission/Pledge: “High Tech”

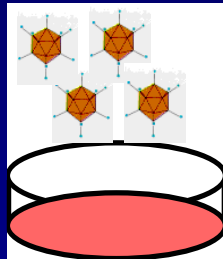
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Department of Radiation Oncology's Translational Gene Therapy Program

Moving Ideas from Bench to the Bedside (& back!)



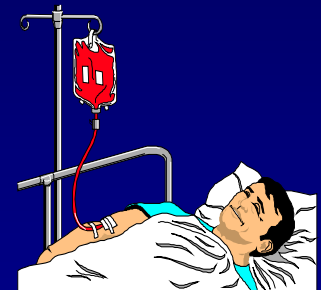
Idea



Cell culture

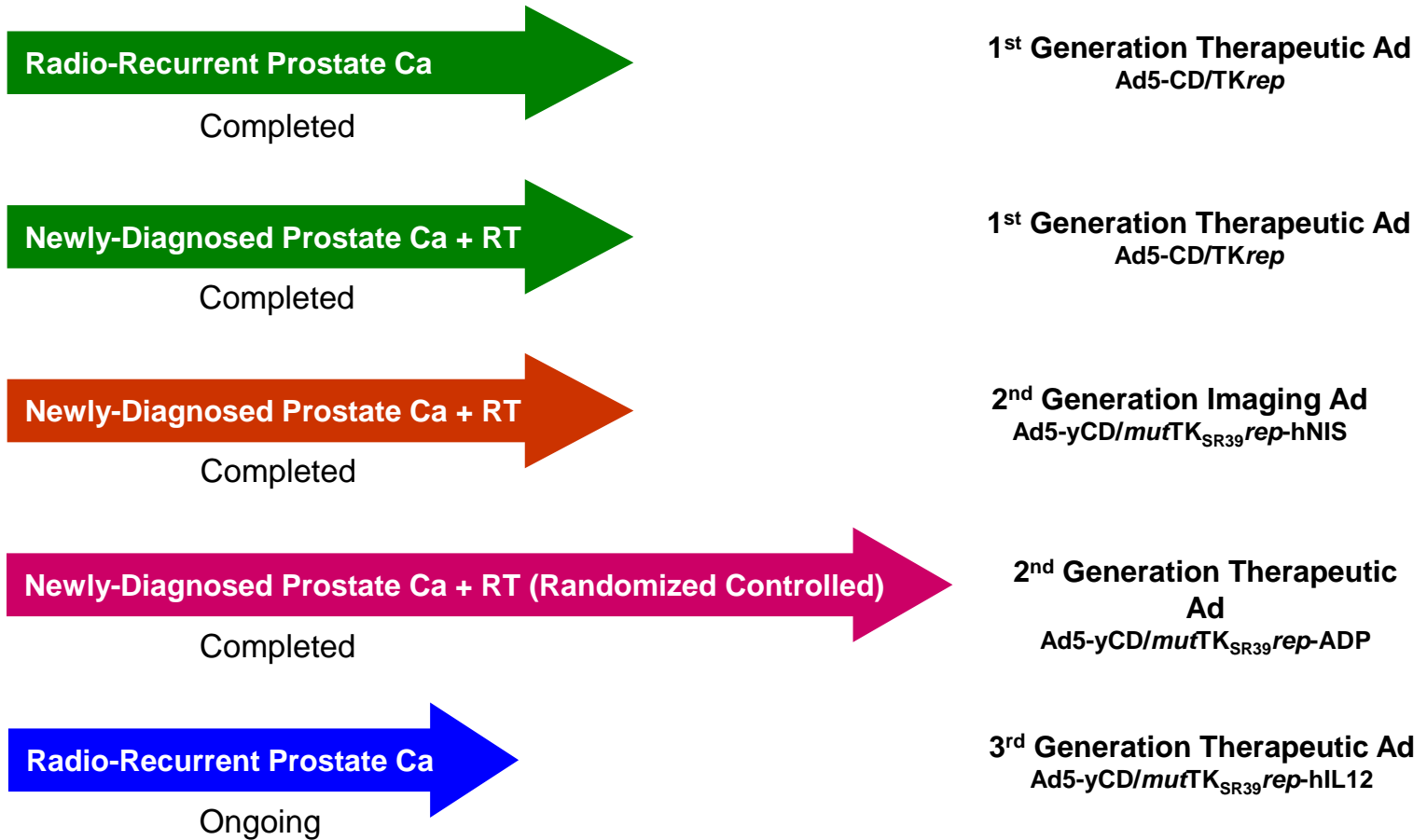


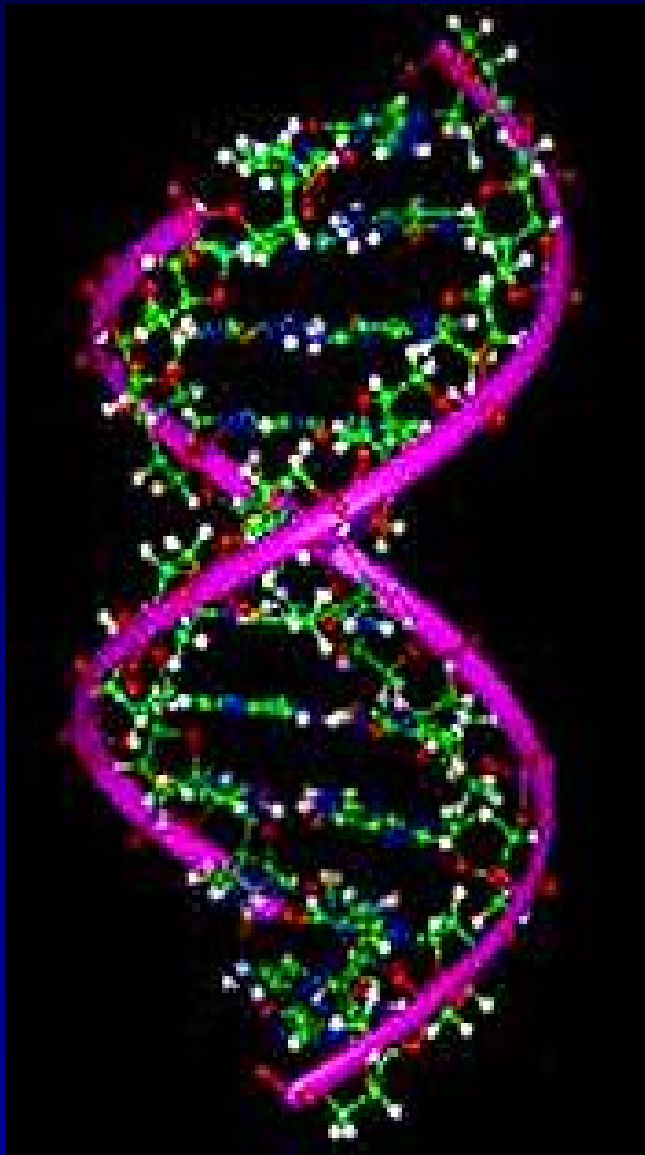
Animal models



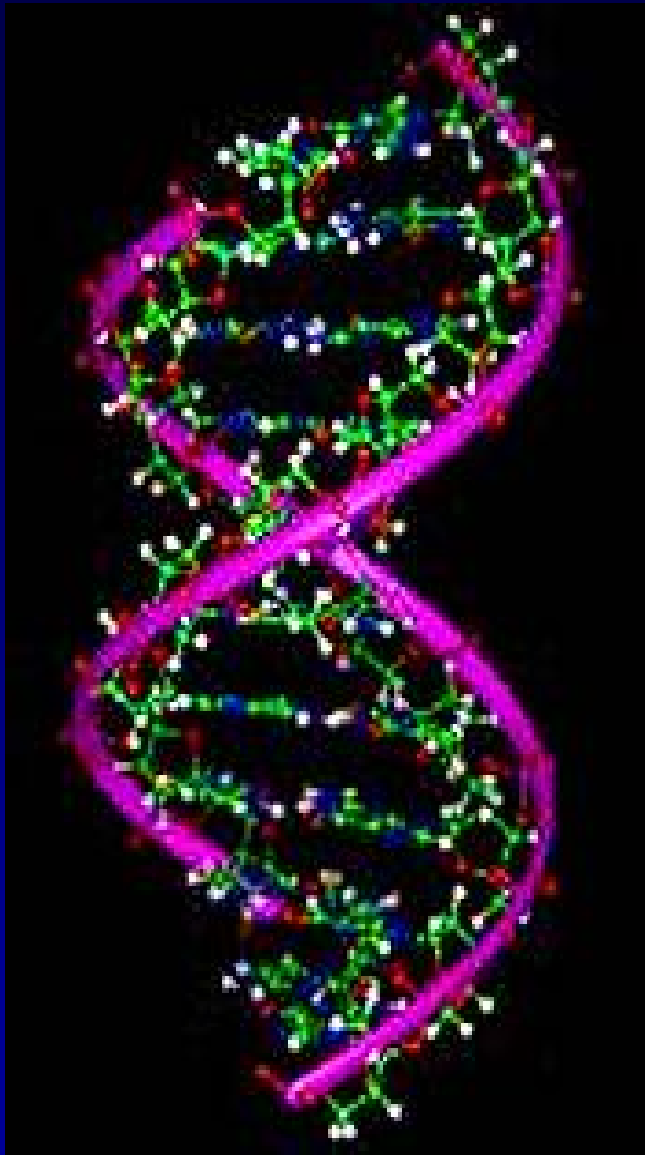
Human trials

Prostate Cancer Clinical Trials





- 5 yrs ago, we were doing phase I (safety) gene therapy clinical trials



- 5 yrs ago, we were doing phase I (safety) gene therapy clinical trials
- Now, we have published a landmark randomized gene therapy study (showing 40% lower + prostate biopsies)!

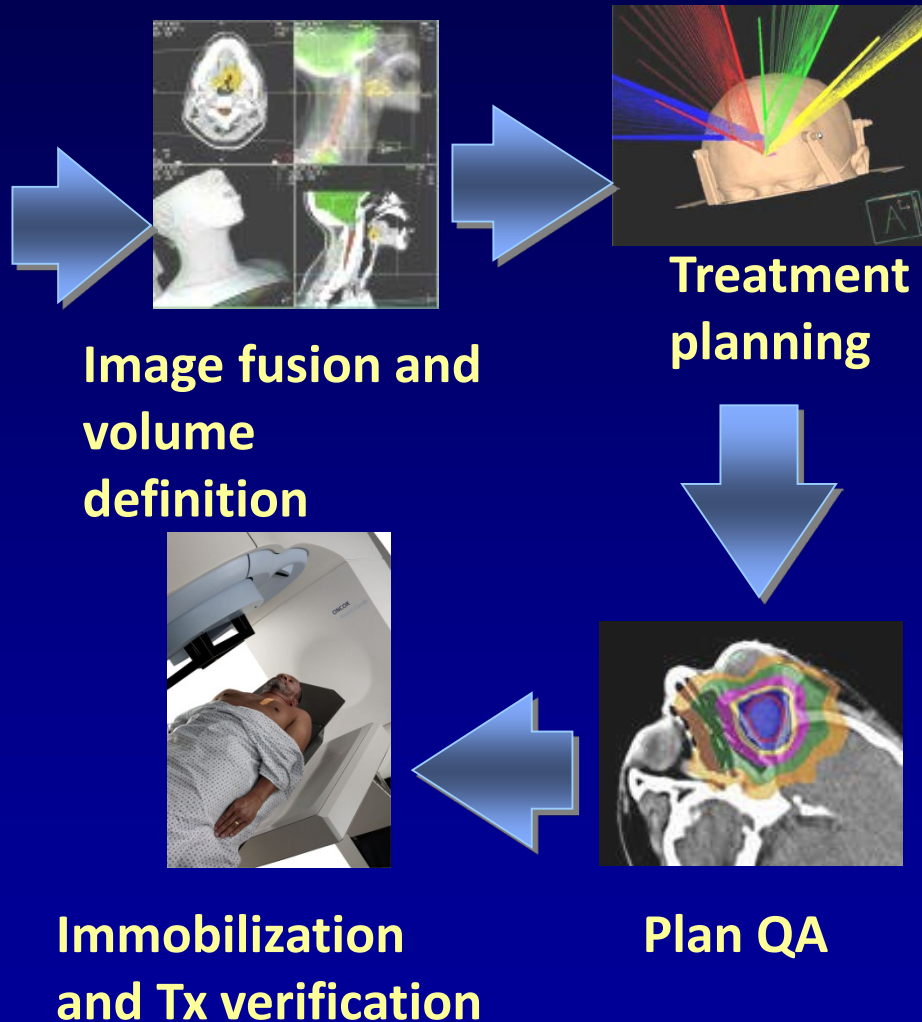


- We were awarded a \$1.5M NCI R01 grant to study combining gene and immune therapy!
- This grant scored in the top 5% of all grants!



- Beyond this, our physics R01 grant (on enhancing image guidance) scored in the top 3% of all grants!!

Radiation Physics Research (Director: Dr. Indrin Chetty)



“Image Registration and Dosimetric Consequences in IGRT”: **\$1.5M NIH/NCI R01**
(PI: Zhong)

– has spawned collaboration with the Henry Ford Innovation Institute to develop a unique lung phantom

-this project has been chosen for commercialization!

HFHS Radonc Department

Radonc has several active NCI R01 grants, an R21 grant, and a NIH SBIR grant!

- R01: Dr. Svend Freytag
- R01: Dr. Hua Zhong (mentor: Dr. Chetty)
- R21: Dr. Jae Ho Kim
- SBIR: Dr. Ben Movsas (with Dr. Steve Brown)

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QOL/Outcomes

- Dr. Walker has successfully implemented unique acupuncture and exercise programs to enhance the quality of life (QOL) of the “whole” individual
- Dr. Movsas has been Chair of the NCI RTOG QOL committee for over a decade

ASCO Study: Exercise May Keep Breast Cancer Patients Healthier (Walker)

- **United Press International (UPI)**
- **Breast Cancer Network News**
- **American Academy of Anti-Aging Medicine (World Health News)**
- **Health News Digest**
- **Times of India**
- **Edmonton Journal**
- **Better Health Research**
- **U.S. News & World Report**
- **HealthDay**
- **BusinessWeek**
- **Fox 12 (Idaho)**
- **Medicine Net**
- **The MedGuru**
- **Lincoln Courier**
- **Health Jockey**

Acupuncture May Cure Hot Flashes, Boost Sex Drive in Breast Cancer Patients (Walker)

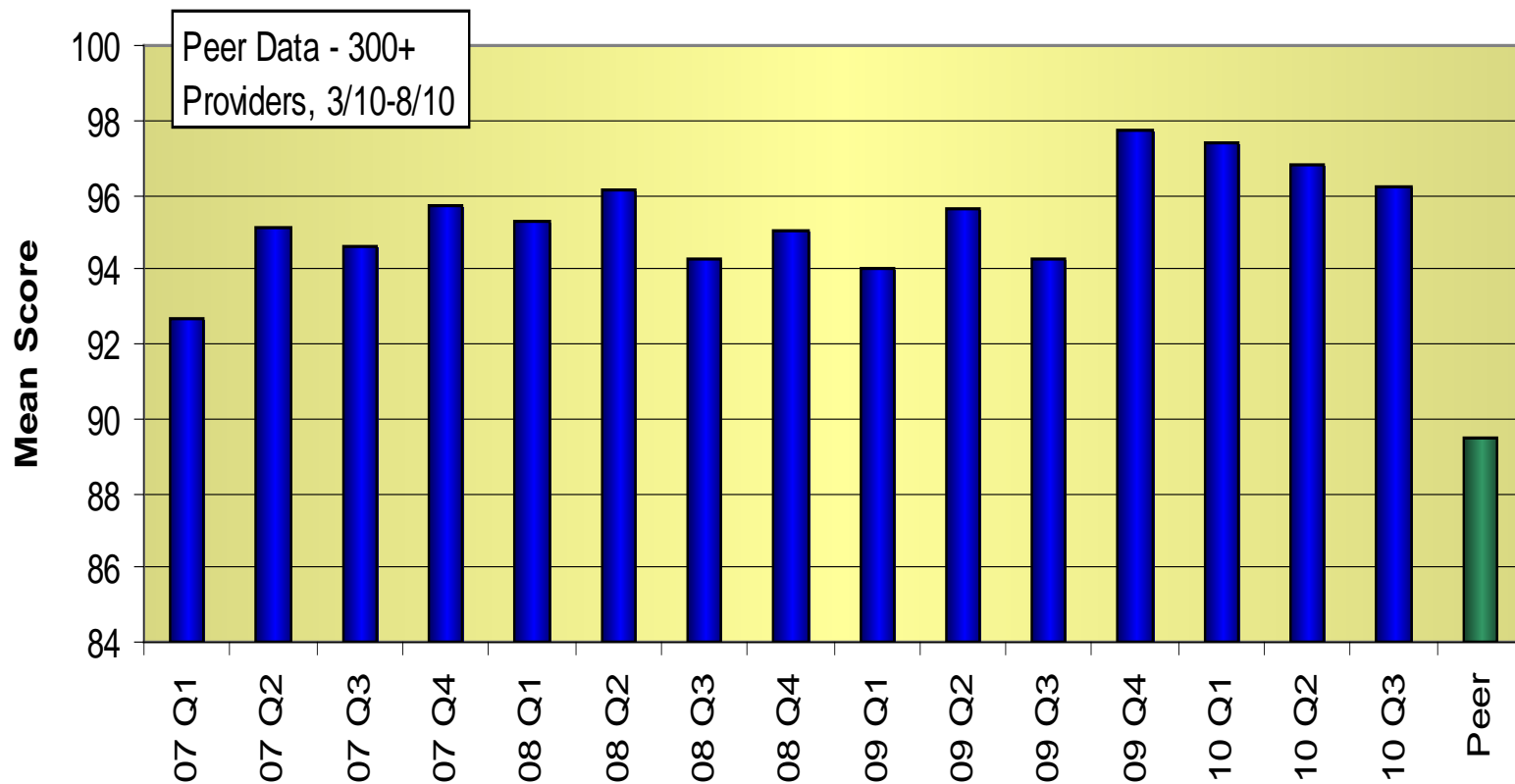
- **Reuters Health UK**
- **Reuters (US)**
- **MedScape**
- **WebMD**
- **United Press International**
- **Yahoo News**
- **National Enquirer**
- **Science Blog**
- **WDIV-Ch. 4 Detroit**
- **MSN**
- **MSN India**
- **WWJ-950 AM**
- **Science Daily HealthDay:**
- **HealthDay TV (via U.S. News)**
- **Business Week**
- **Cancer Consultants**
- **Breast Cancer Network News**
- **Times of India:**
- **HemOnc Today**
- **Post Chronicle**
- **eMax Health**
- **BETTER Health Research**
- **Fox New York (local - state)**
- **Business Standard (India)**
- **Palm Beach Post**
- **Food Consumer (online)**
- **Health News**
- **Modern Medicine**
- **Science Blog**
- **Natural News**

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Medical Practice Survey - Radiation Oncology



RadOnc Mission/Pledge

“High Touch”

Thank you so much for giving us the precious gifts of hope, joy, and peace of mind

We have been truly blessed to have your expertise, understanding, and kindness guiding us through treatment

Wonderful Team Approach!

- Therapists
- Nurses
- Residents
- Senior staff MDs
- CSRs
- Dosimetrists
- Physicists
- Researchers
- Administrators
- Neurosurgery/neuro-oncology
- JFCI Council

REVOLUTIONARY TEAM.....THANKS!!



RadOnc Mission/Pledge

“High Touch”

Thank you for your kindness and compassion

Thanks you for your dedication

Thank you for restoring our hope!

RadOnc Mission/Pledge

“High Touch”

You should be very proud of your staff in the Radiation Oncology department!

I was treated with warmth, kindness and professionalism every morning.



**Gene
Therapy**

Stereotactic RT

Vision: 2015!

**QOL/Clinical
Trials**

