

Radiation Treatment of Lung Cancer: What's on the Horizon?

Focus on Lung Cancer Patient Symposium

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October 23, 2009

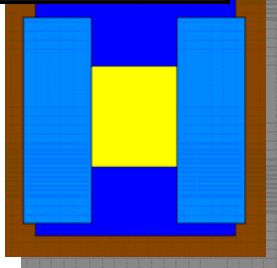
Radiation Treatment of Lung Cancer: What's on the Horizon?

- New and exciting developments from early stage to locally advanced disease
- What does a radiation oncologist do?
 - Identification of disease
 - Where is the cancer?
 - Targeting the tumor
 - Where are the nearby vital organs?
 - Where are the regional sites at risk for disease spread?
 - Treating the disease
 - What dose is required to treat the disease?
 - What dose can the nearby vital organs tolerate?

The Evolution of Modern Radiation Oncology

1960's

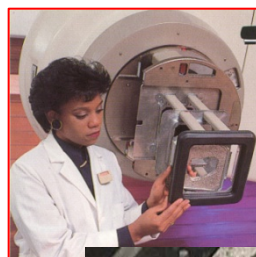
The First Clinac



Standard Collimator

The clinac reduced complications compared to Co60

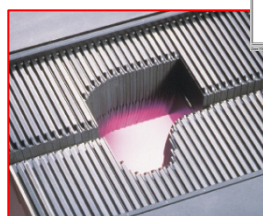
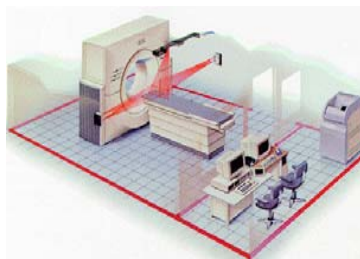
1970's



Cerrobend Blocking
Electron Blocking

Blocks were used to reduce the dose to normal tissues

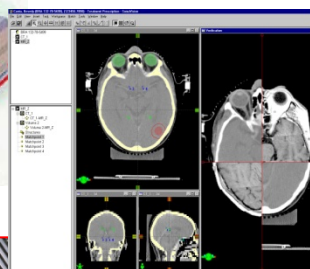
1980's



Multileaf Collimator

MLC leads to 3D conformal therapy which allows the first dose escalation trials.

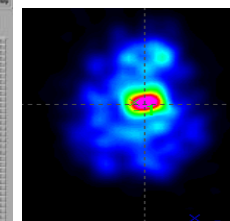
Computerized 3D CT
Treatment Planning



Dynamic MLC
and IMRT

Computerized IMRT introduced which allowed escalation of dose and reduced complications

1990's



Functional
Imaging

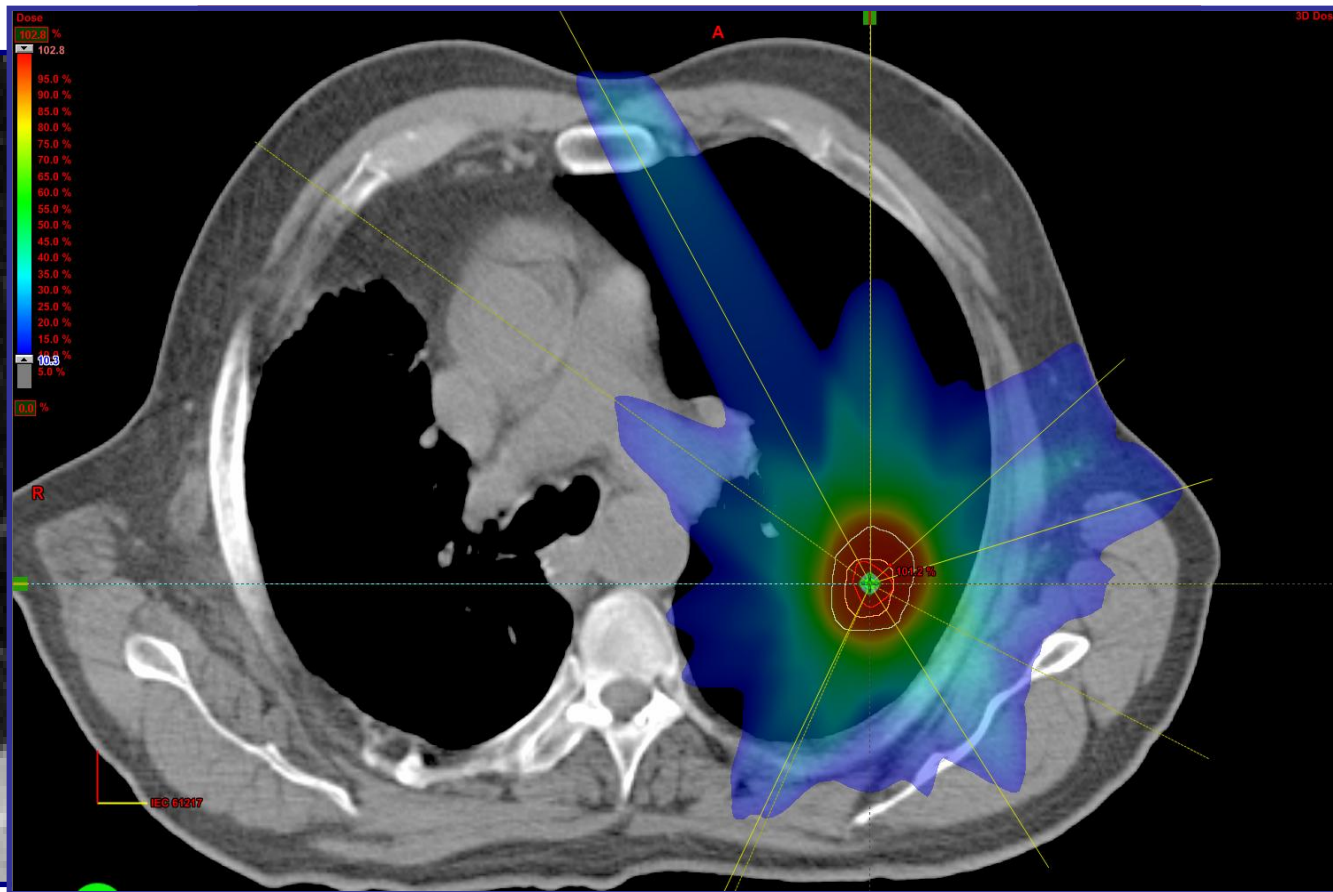
High resolution IMRT

IMRT Evolution evolves to smaller and smaller subfields and high resolution IMRT along with the introduction of new imaging technologies

2000's

Early Stage Disease

Early Stage Disease: Stereotactic Body Radiation Therapy



Pretreatment

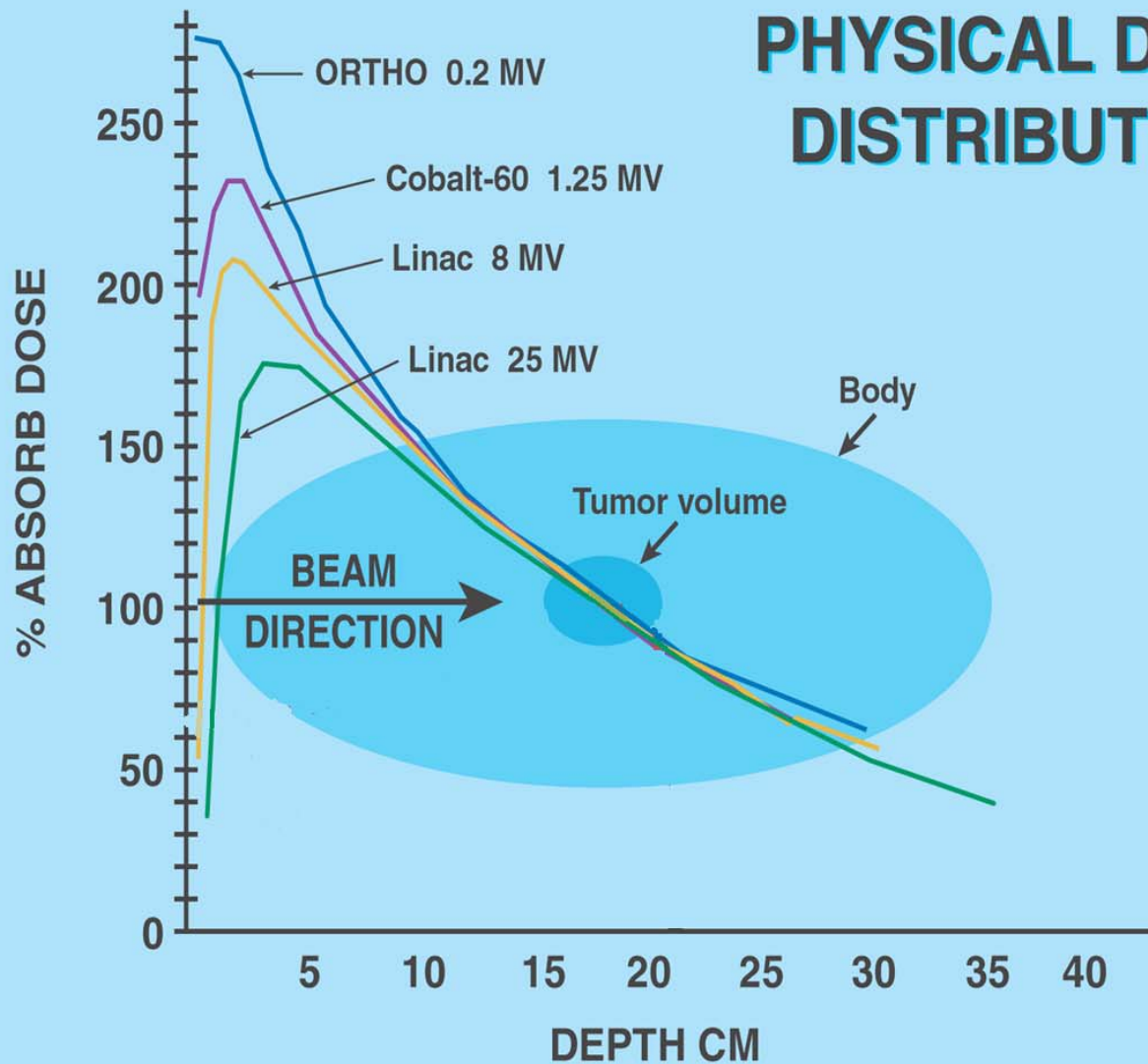
6-weeks Post-treatment

Locally Advanced Disease

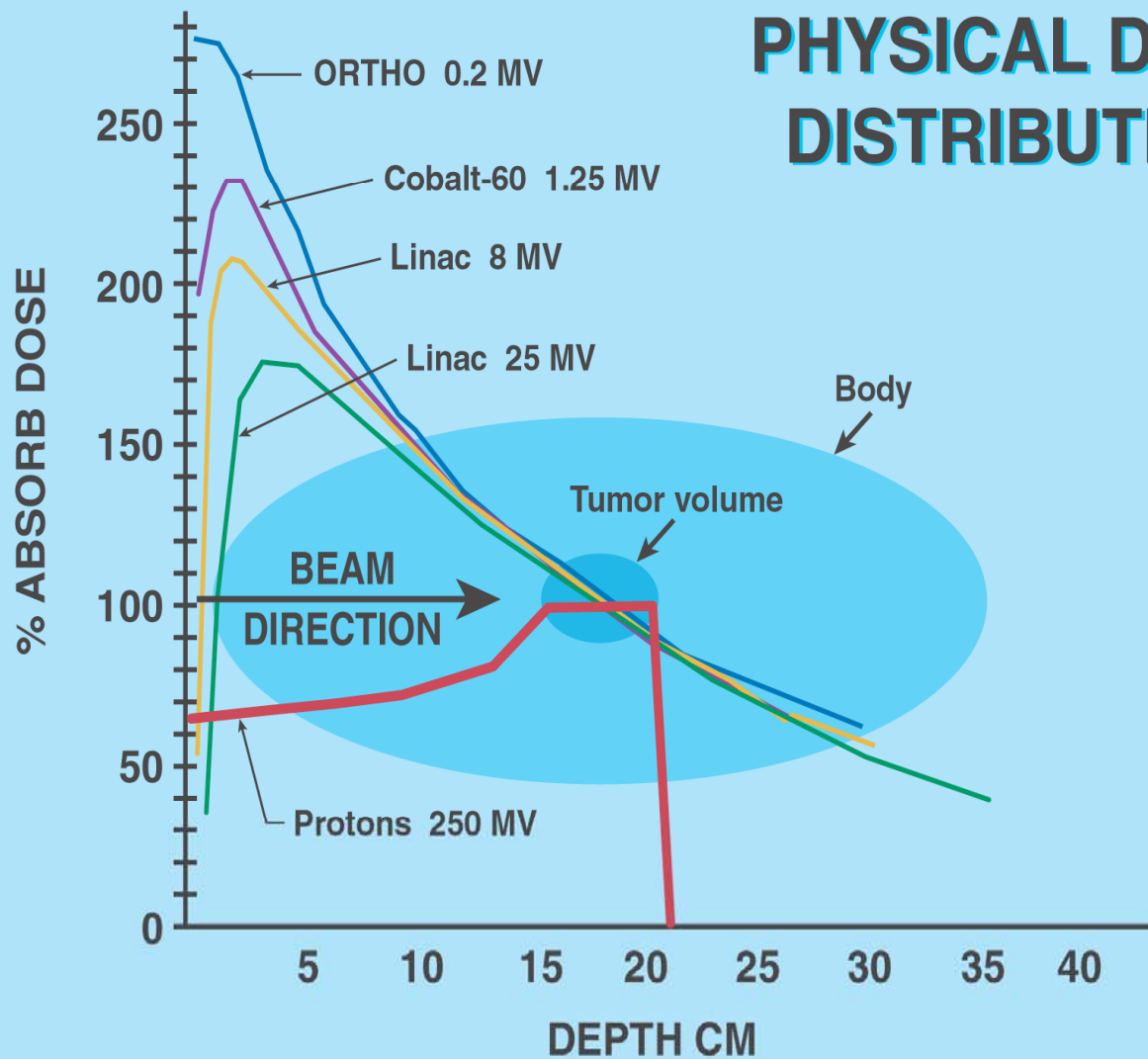
Roberts Proton Therapy Center



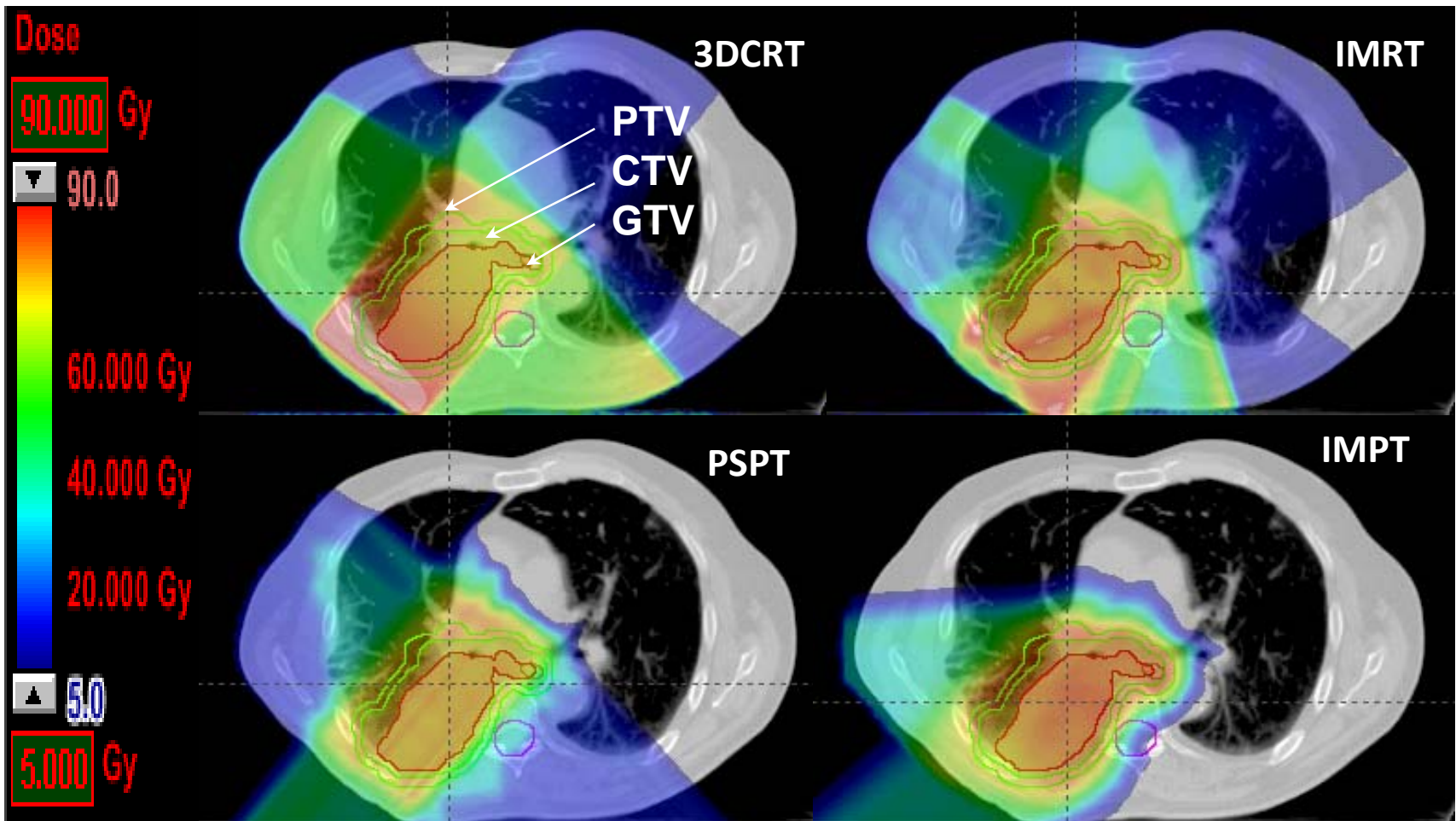
PHYSICAL DOSE DISTRIBUTION



PHYSICAL DOSE DISTRIBUTION







With permission from J. Chang

Proton Protocols (not yet open)

Phase I/II Dose Escalation Study of Thoracic Proton Beam Radiotherapy with Concurrent Chemotherapy for Locally-Advanced NSCLC

Eligibility: Ages 18 or older; non-pneumonectomy as determined by surgeons; Stage IIIA/Superior Sulcus

Study Design: CDDP/VP-16 with radiotherapy to 50.4/ 59.4/ 66.6 CGE

Accrual: 12(feasibility)/10/10 with an additional 40 at MTD

PI: Ramesh Rengan MD PhD

Phase I/II Dose Escalation Study of Thoracic Proton Beam Radiotherapy with Concurrent Chemotherapy for Locally-Advanced NSCLC

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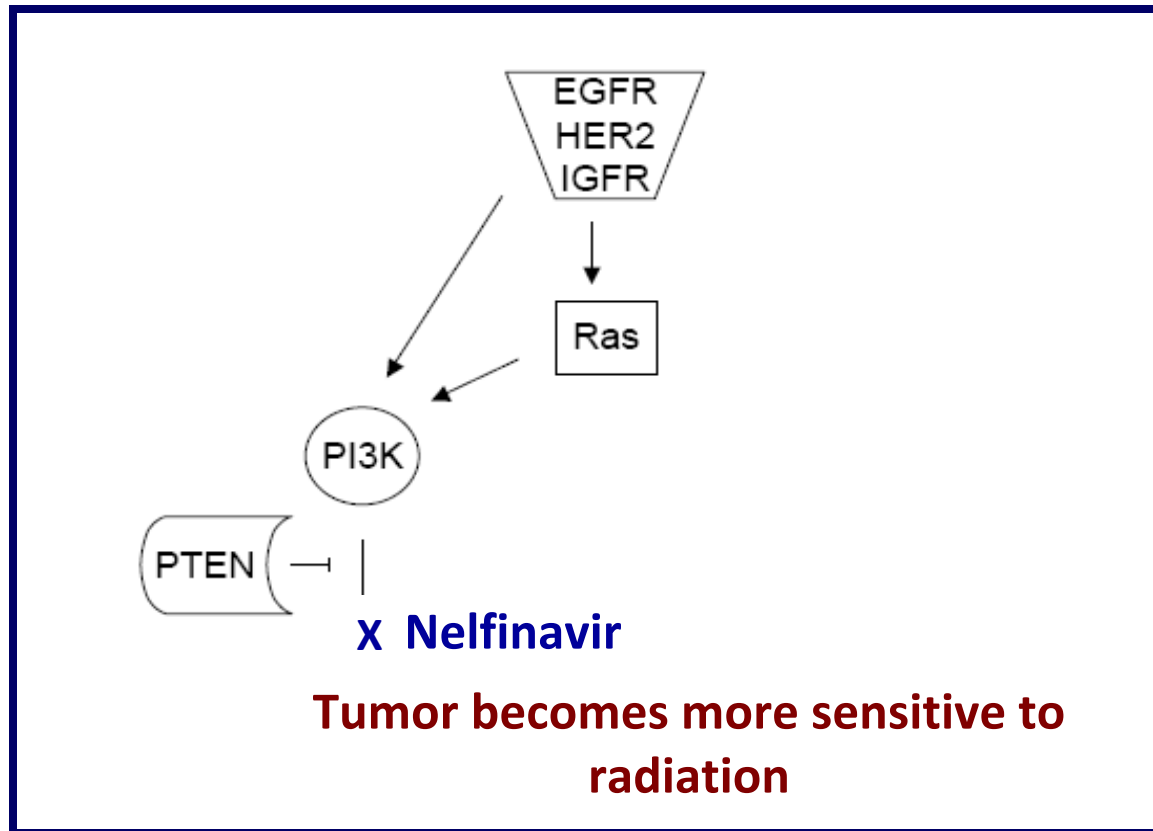
66.6Gy; 70.2Gy; 75.6Gy; 81Gy; 86.4Gy; and 90Gy CGE (tentative)

Accrual: 12(feasibility)/10/10/10/10/10 with an additional 45 at MTD

PI: Ramesh Rengan MD PhD

Tumor Biology

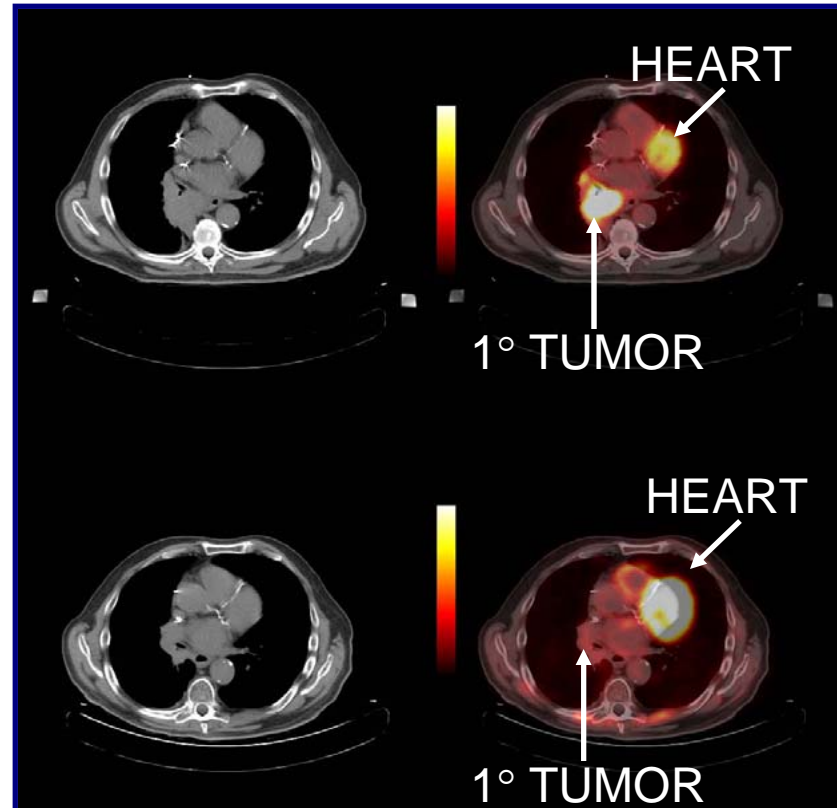
Tumor Survival Response to Radiation



Adapted from Rengan et al Canc. Met. Reviews 2008

Understanding Tumor Biology

PRETREATMENT
PET/CT



3-MONTH
POST-TREATMENT
PET/CT

Conclusion



Personalized Oncologic Treatment Paradigms

Thanks to our Wonderful Patients