

**Mehdi Adineh, PhD**  
Scientific Director of Imaging Core Lab

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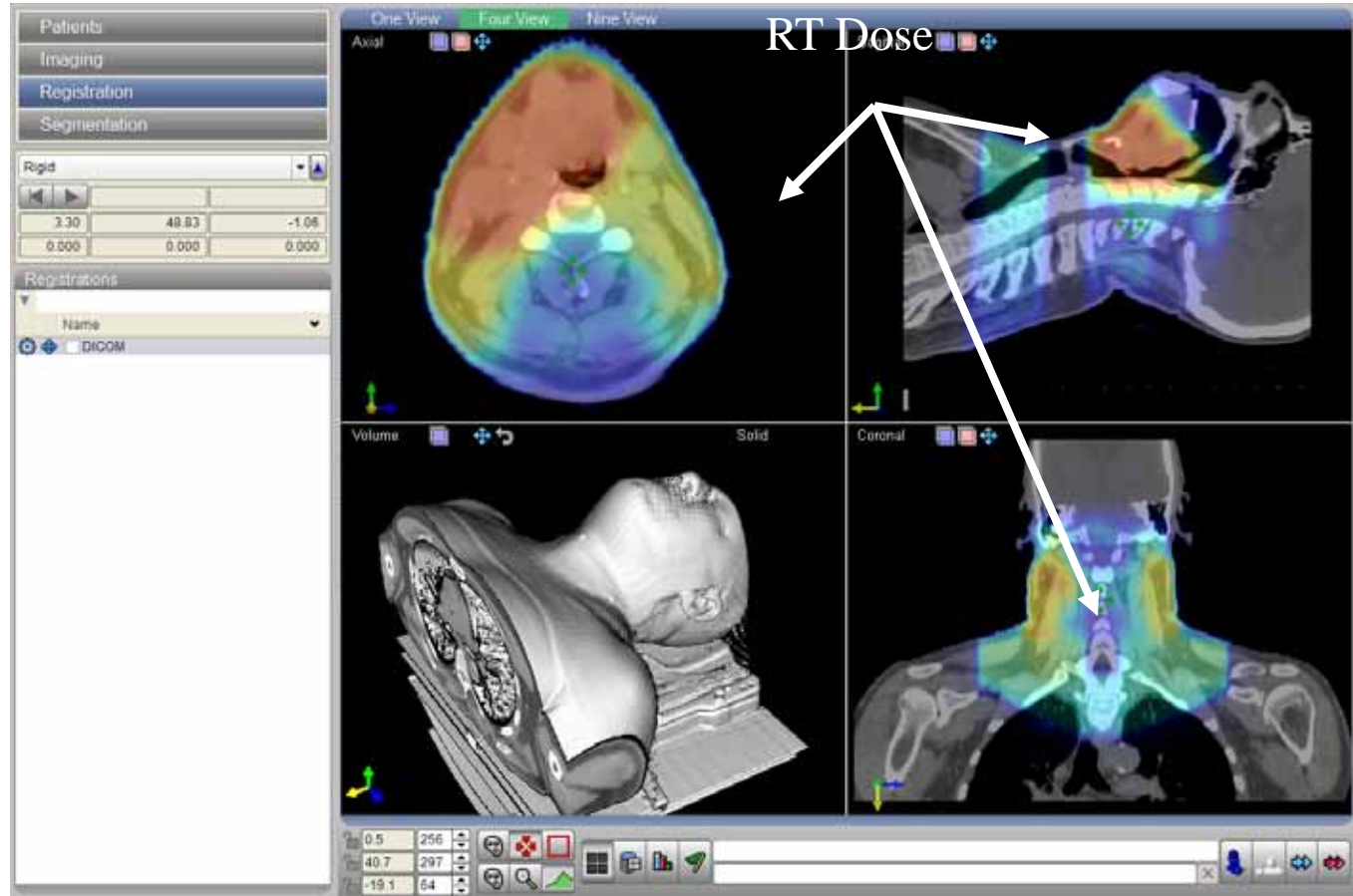
# CORE LAB

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- MR/PET/CT/Radiation-Therapy components
  - Imaging Protocol development
  - Site evaluation and training
  - Image management/analysis/archival: **TRIAD**
  - Radiotherapy Data Management and Analysis
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# ACRIN/RTOG SYNCHRONIZATION

Image QC  
Case Review



# CORE LAB EVOLUTION

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ROLE


INFRASTRUCTURE

RESEARCH FOCUS

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# ROLE

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- ❑ Managing Data Collection
  - ❑ Reader Studies
  - ❑ Image QC
  - ❑ Define imaging guidelines
  - ❑ Ensure competency of sites
  
  - ❑ Full GCP compliance
  
  - ❑ Advanced Data Processing:
    - ❑ DCE MR, Novel PET, Volumetric Imaging and MRS
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# NOVEL IMAGE PROCESSING TOOLKITS

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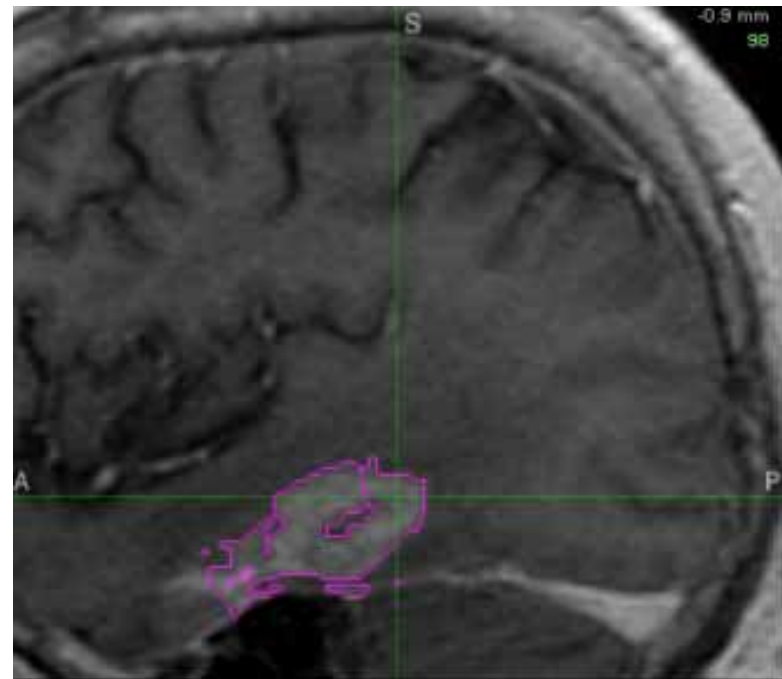
- ❑ Development of data mining toolkits
  - ❑ Co-develop data query and analysis tools
  - ❑ Enhanced image manipulation and visualization
  - ❑ Support novel imaging integration into routine clinical care: examples
    - ❑ Dynamic Contrast MRI
    - ❑ Diffusion Tensor MRI
    - ❑ FLT-PET
    - ❑ Volumetric CT
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ROLE

INFRASTRUCTURE

RESEARCH FOCUS

# VOLUMETRIC ANALYSES



# INFRASTRUCTURE:

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- ❑ Quantitative Imaging:  
SUV, Total Lesion Glycolysis, Functional Volume, RECIST, Volumetric analyses
  - ❑ Data Integrity QA/ Transfer/Integration
    - ❑ Radiotherapy CT, Structures, Plan, Dose
    - ❑ Imaging Datasets
    - ❑ Other RT Objects
  - ❑ Case Review
    - ❑ Remote Review
    - ❑ Follow-up
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ROLE

INFRASTRUCTURE

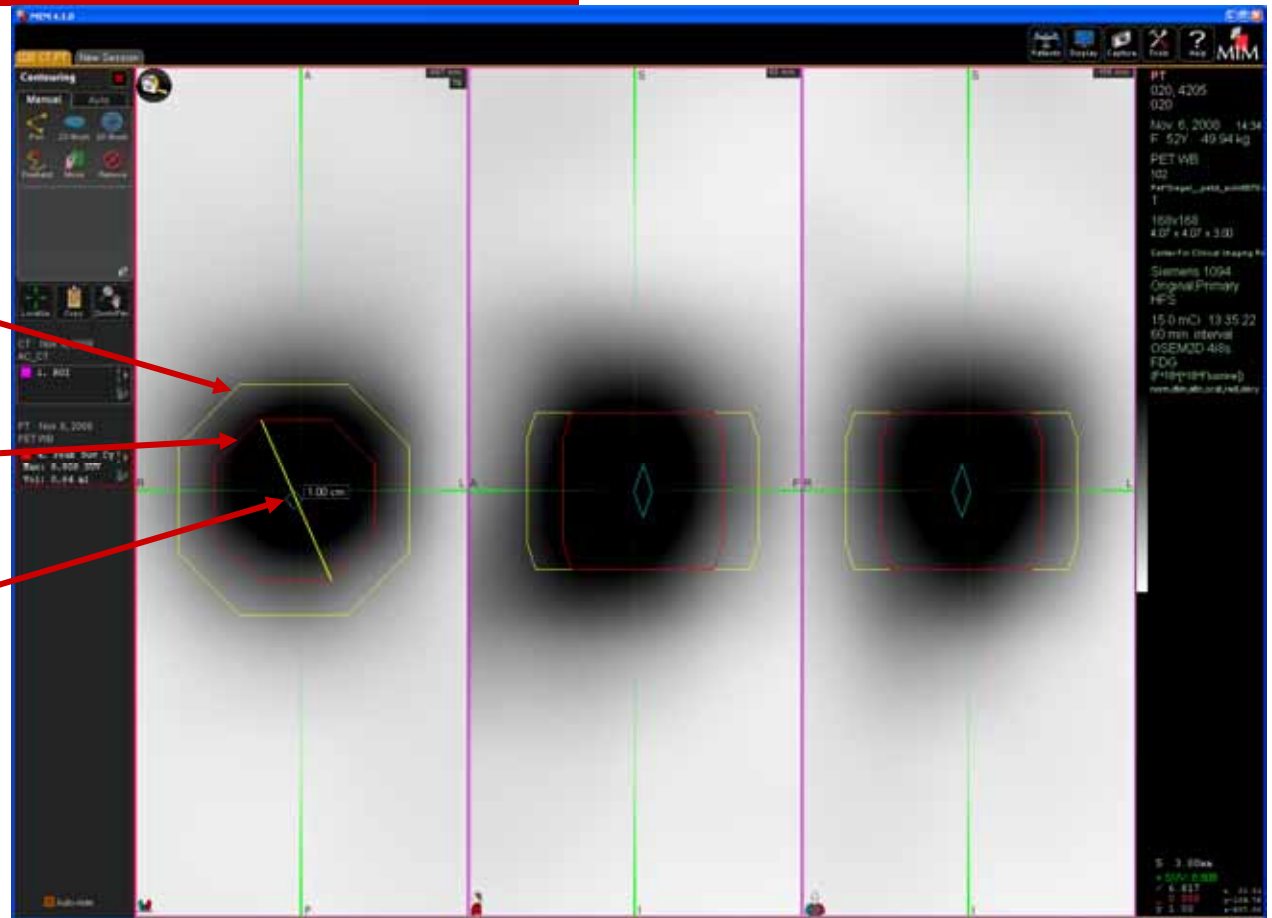
RESEARCH FOCUS

# TOOLKIT DEVELOPMENT

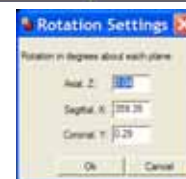
Cluster Analysis

ROI to map  
SUVmax

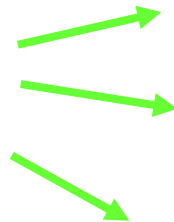
SUVmax



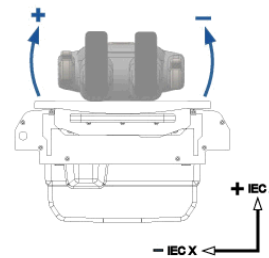
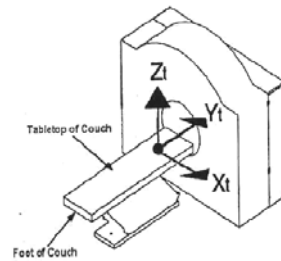
# FUSION

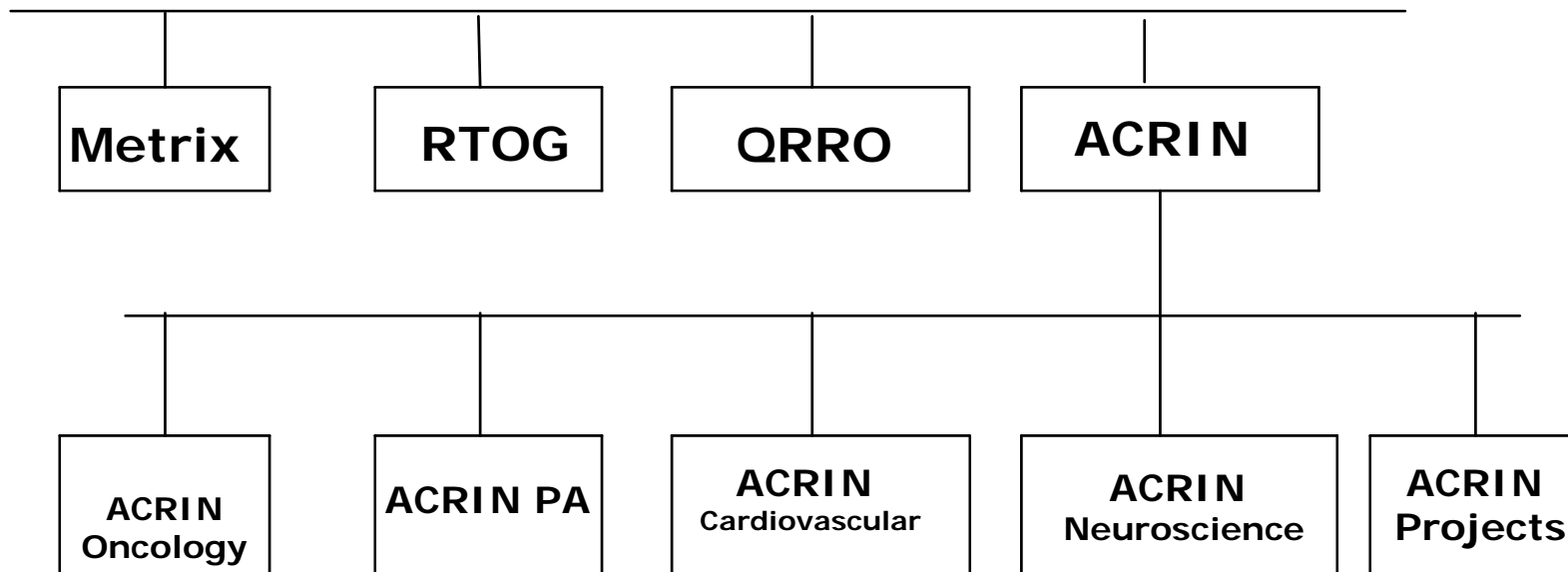


IGRT shifts compared



Tomotherapy Shifts  
 X            Y            Z            Roll  
 -10.8      -1.9            +8.8      -0.07





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IMAGING CORE LAB EVOLUTION

ROLE

INFRASTRUCTURE

RESEARCH FOCUS

# Extending the Reach of RTOG

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- State of Pennsylvania CURE grants
    - Evaluate Case Review Process for Advanced Technology Protocols
    - Determine Patient Dose for Image-Guided Radiation Therapy (IGRT)
    - Determine Uncertainties for Clinical Trials
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