RPC Report to Advanced Technology Consortium

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RPC Radiological Physics Center

Excellence through Quality Assurance

http://rpc.mdanderson.org

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CANCER CENTER
Making Cancer History®

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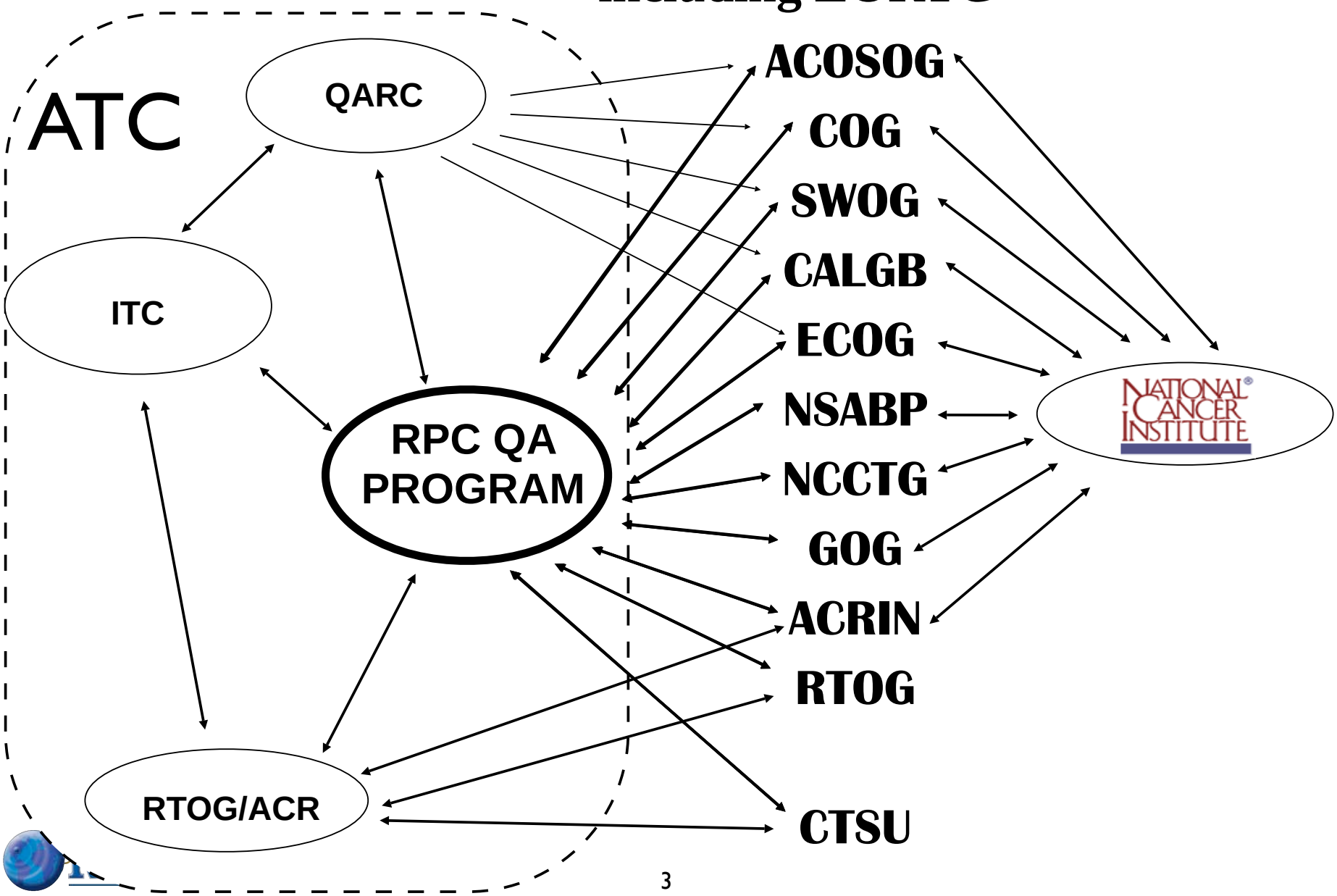
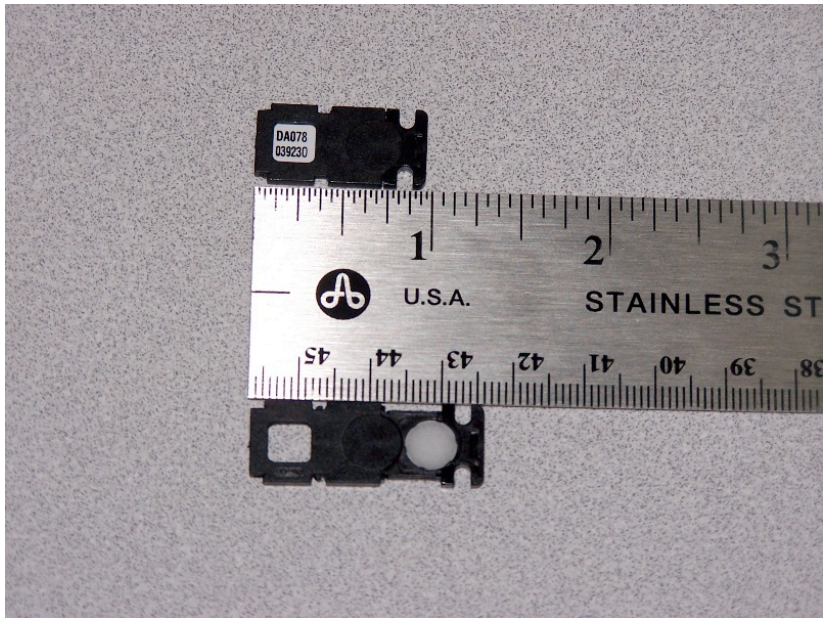
RPC

RPC has relationships with <u>all</u> study groups, including EORTC



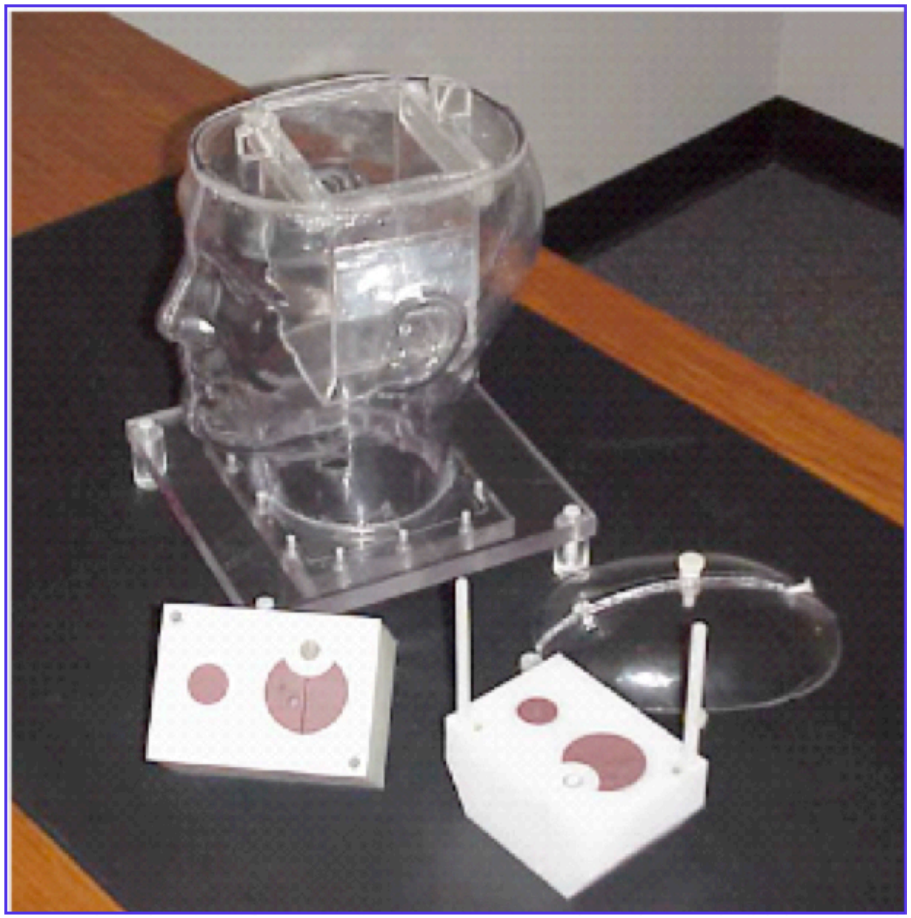
Optically Stimulated Luminescence (OSL) Dosimeters

- Detector material of aluminum oxide crystals (Al_2O_3:C)
- Landauer's InLight™ dosimeters and microStar™ Reader

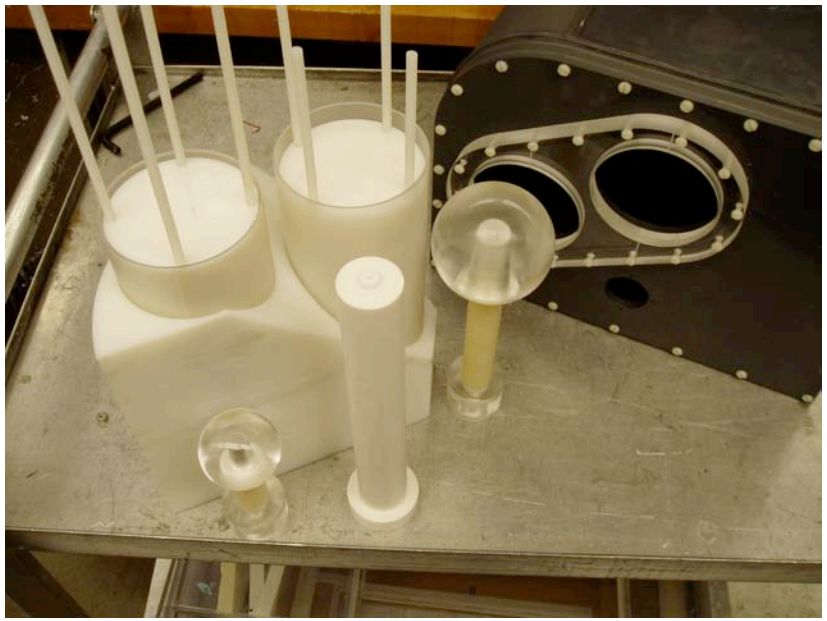


H&N Phantom

- 31 phantoms
- No waiting list

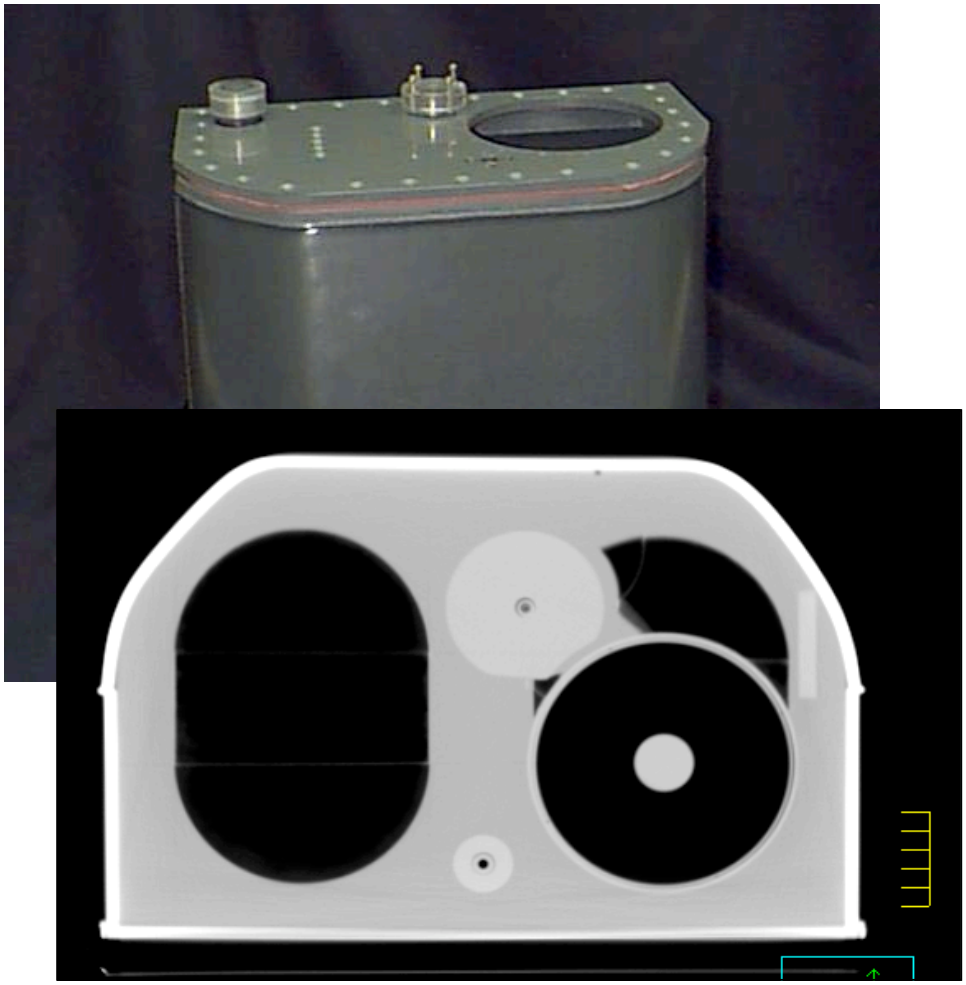


Liver Phantom



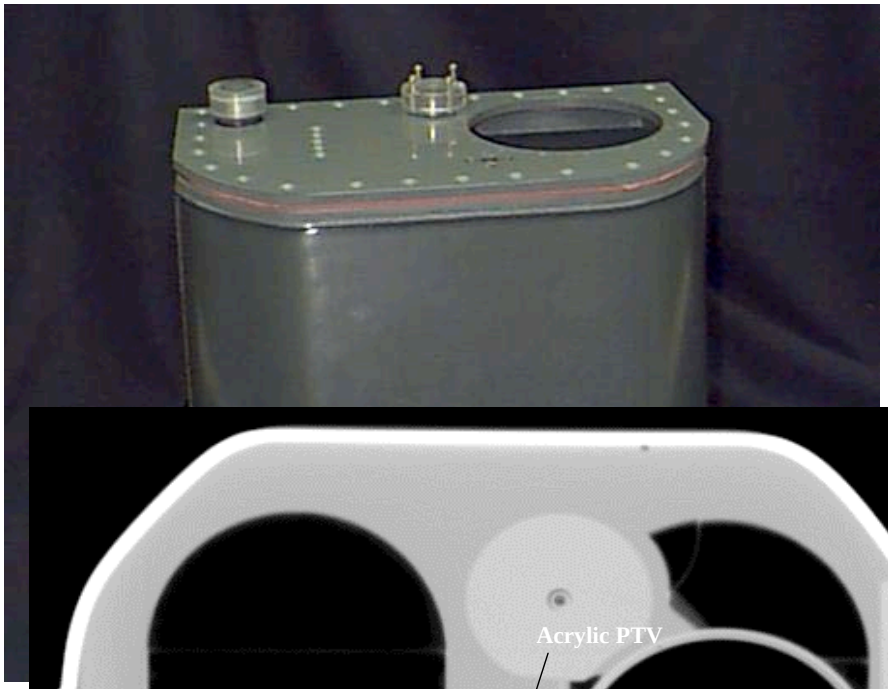
- 2 phantoms
- 2 moving platforms
- 1 being repaired
- 1-2 months waiting list

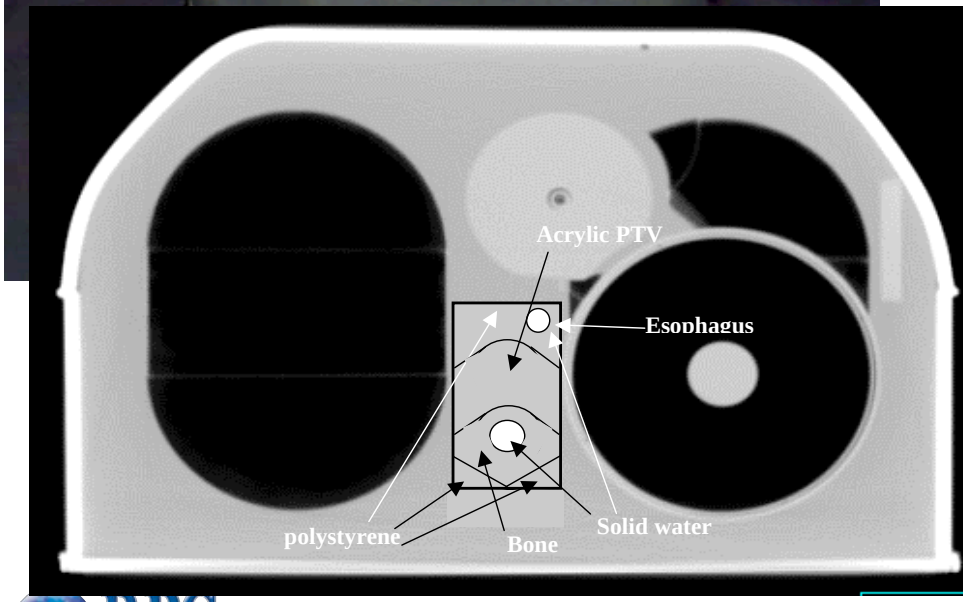
Lung Phantoms



- 9 Phantoms
- 3 to be repaired
- Building 4 new phantoms
- 3 with spine insert
- 4-5 weeks waiting list

Lung Phantoms





- 9 Phantoms
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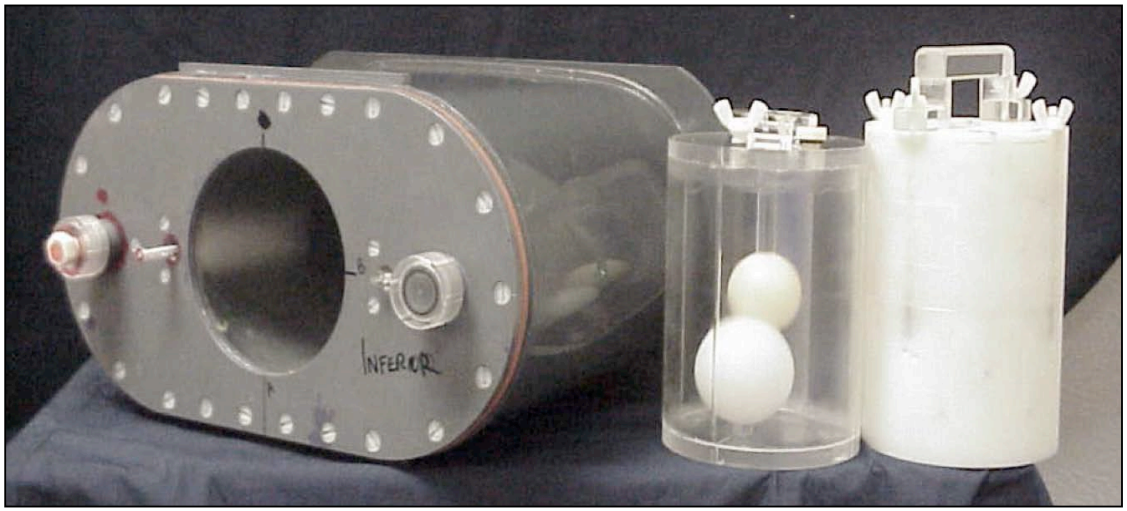
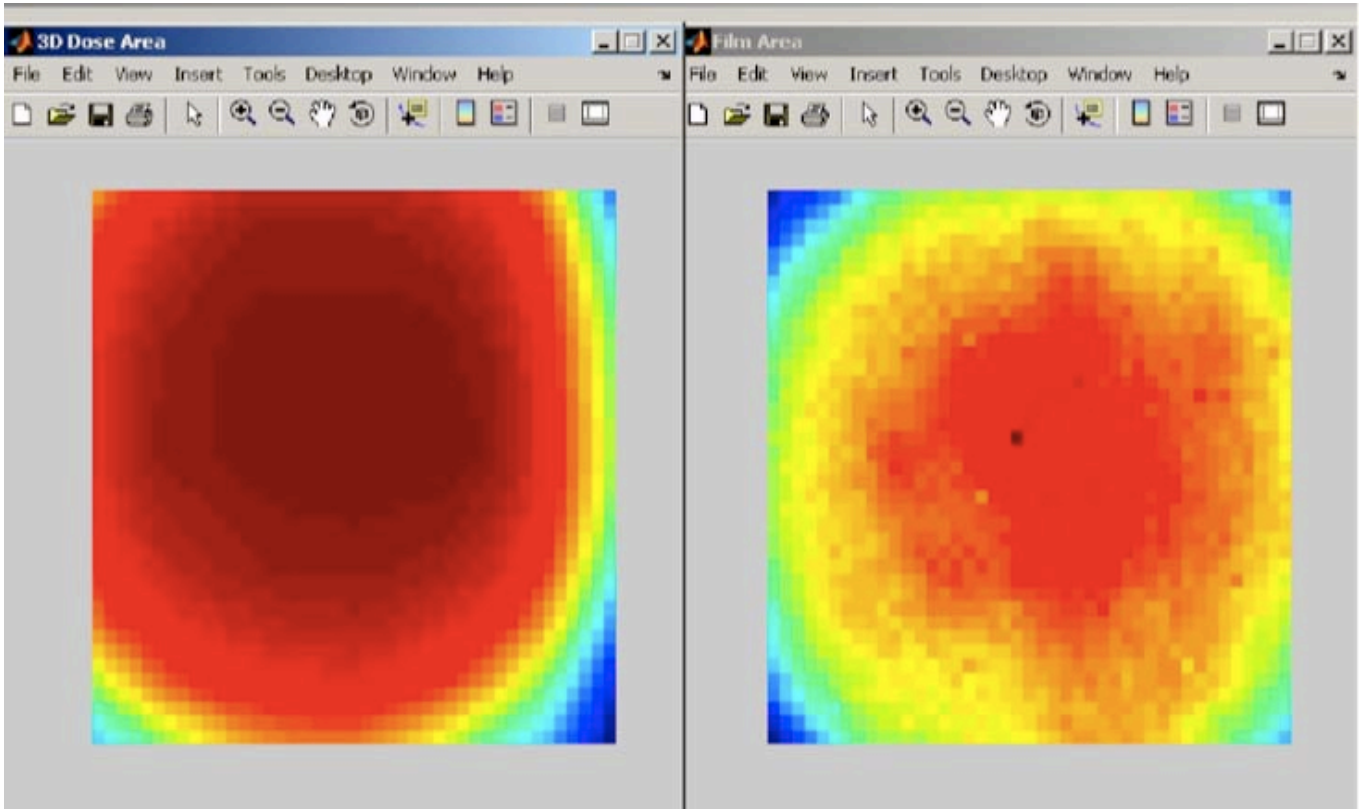
Prostate Phantom

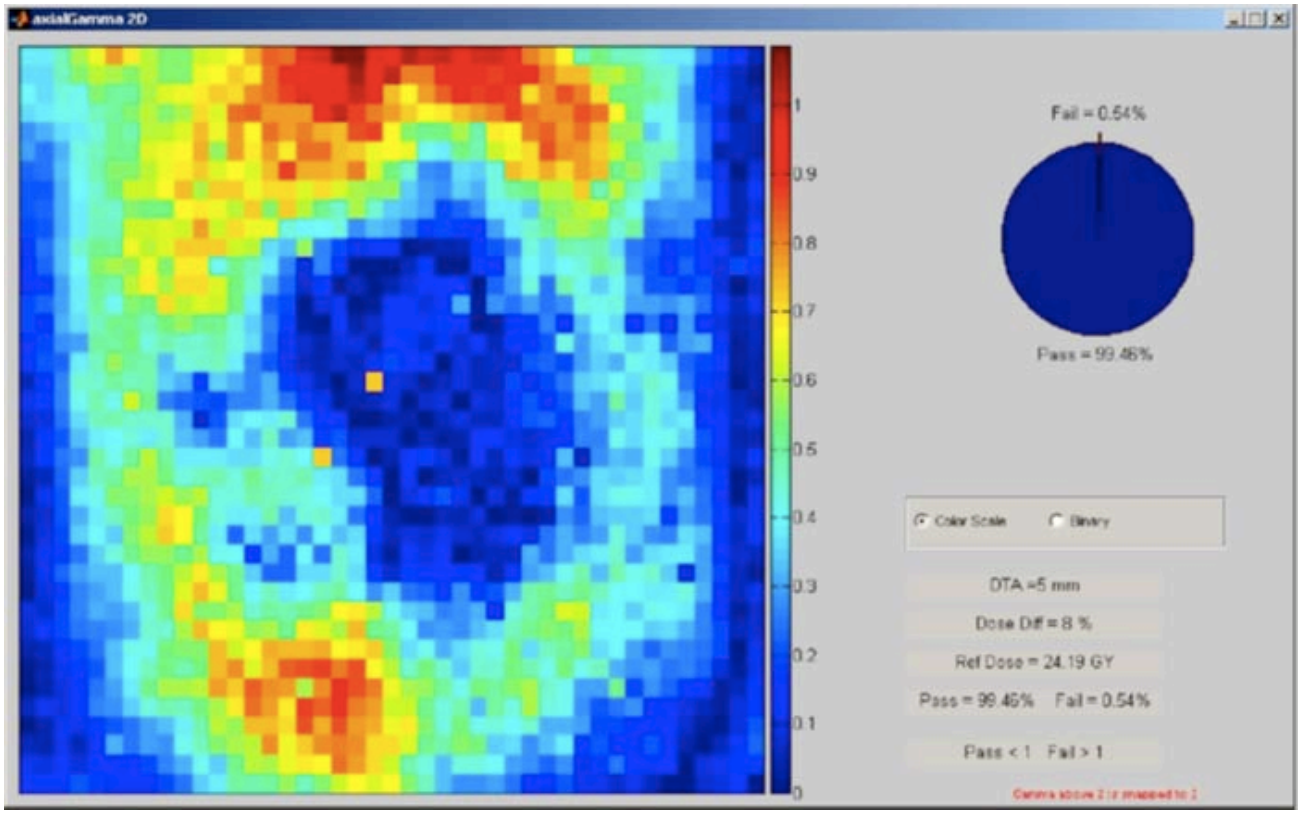


- 4 phantoms
- 6 under construction
- All with proton-compatible insert
- 4-5 weeks waiting list

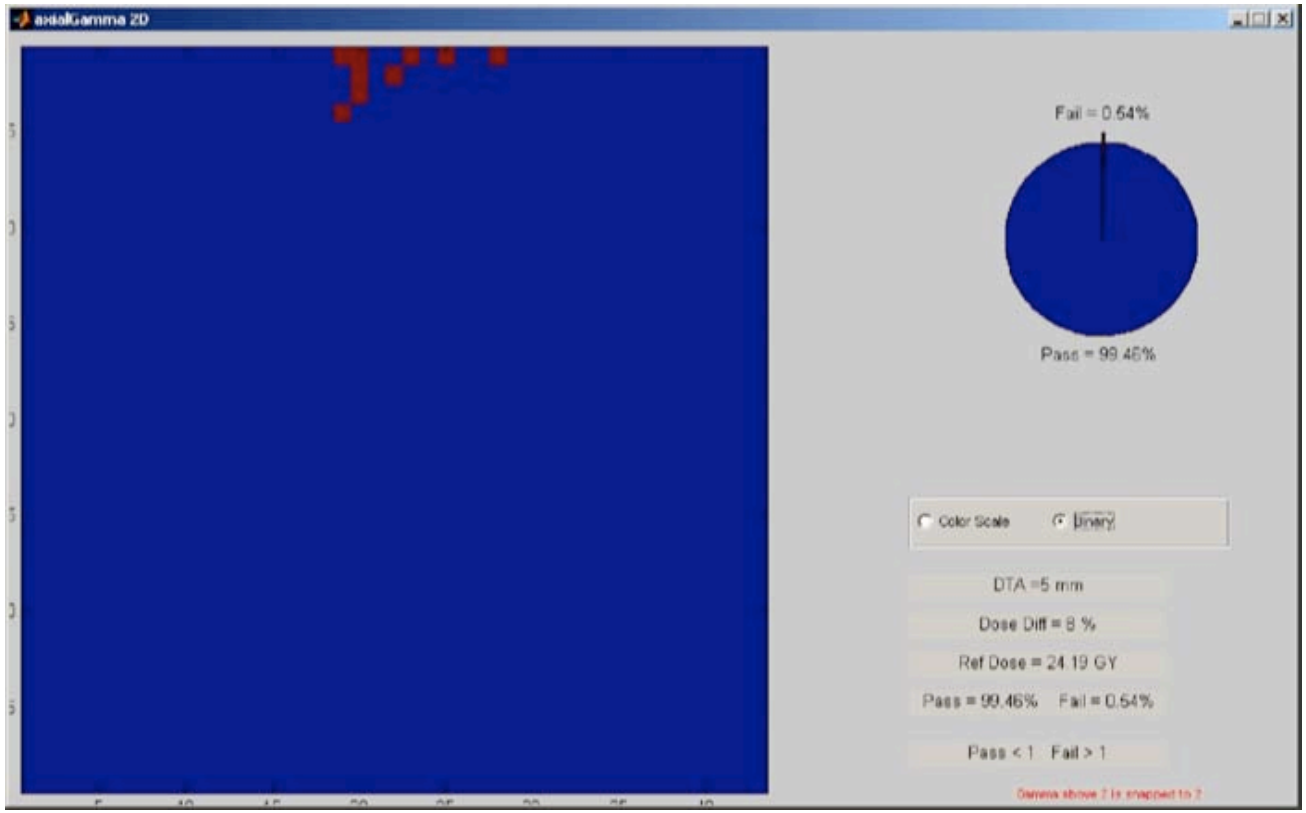
2D Gamma Index Evaluation "Good" Irradiation



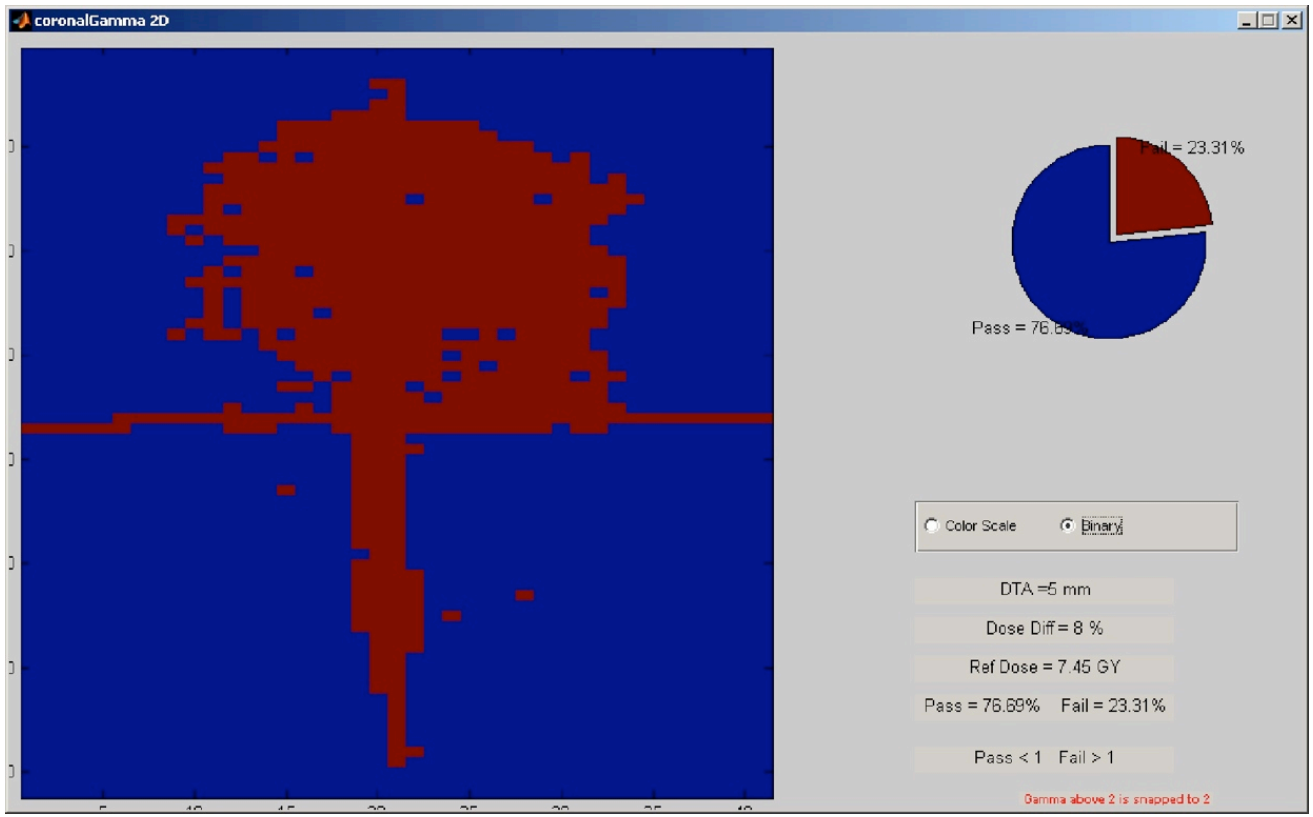
2D Gamma Index Evaluation "Good" Irradiation



2D Gamma Index Evaluation "Good" Irradiation



2D Gamma Index Evaluation
Failing Irradiation



Lung Phantoms - Status

			Average Percentage of Pixels Passing 5% / 5 mm*		
Algorithm	Number of Institutions	Number Evaluated	Axial	Coronal	Sagittal
Pencil Beam	12	8	74±25	62±25	53±25
Super-position	21	15	92±12	75±21	79±22

* Percentage of TLD dose measurement

CyberKnife

- Need to resolve issues with ITC submission
- Several irradiations with Monte Carlo algorithm that we can't evaluate

CERR Wish List

1 Ability to overlay the planned dose and film dose over the CT. Also the ability to overlay the gamma calc over the CT.

   a. Contour Plot for Dose and Gamma all over-layed over CT.

2 Ability to create a report including film profiles and gamma analysis.

   a. Auto report generation with image capture.
   b. Workflow inputs from Andrea.

3 Ability to mask areas that are of no interest (ie film slits).

   a. Exclusion criteria for film area selection.

4 Ability to have shapes for ROI other than rectangle.

   a. Contour driven ROI with expansion.

5 Denoising tests

Review of H&N Phantoms

- All cases submitted to ITC in 2007 have been reviewed
- 2D gamma calculation done using CERR
- Next step: analysis by RPC senior staff

Final Items

- Collaboration with Dr. Deasy to develop Monte Carlo calculations
- Preparation for audits & credentialing for protons

ATC-SC Comments

- Mine RPC database
  - People don't know what's in the database
- Standardize credentialing
  - First effort: single facility questionnaire
- Attend PBTC