

RPC Report to ATC



January 20, 2005

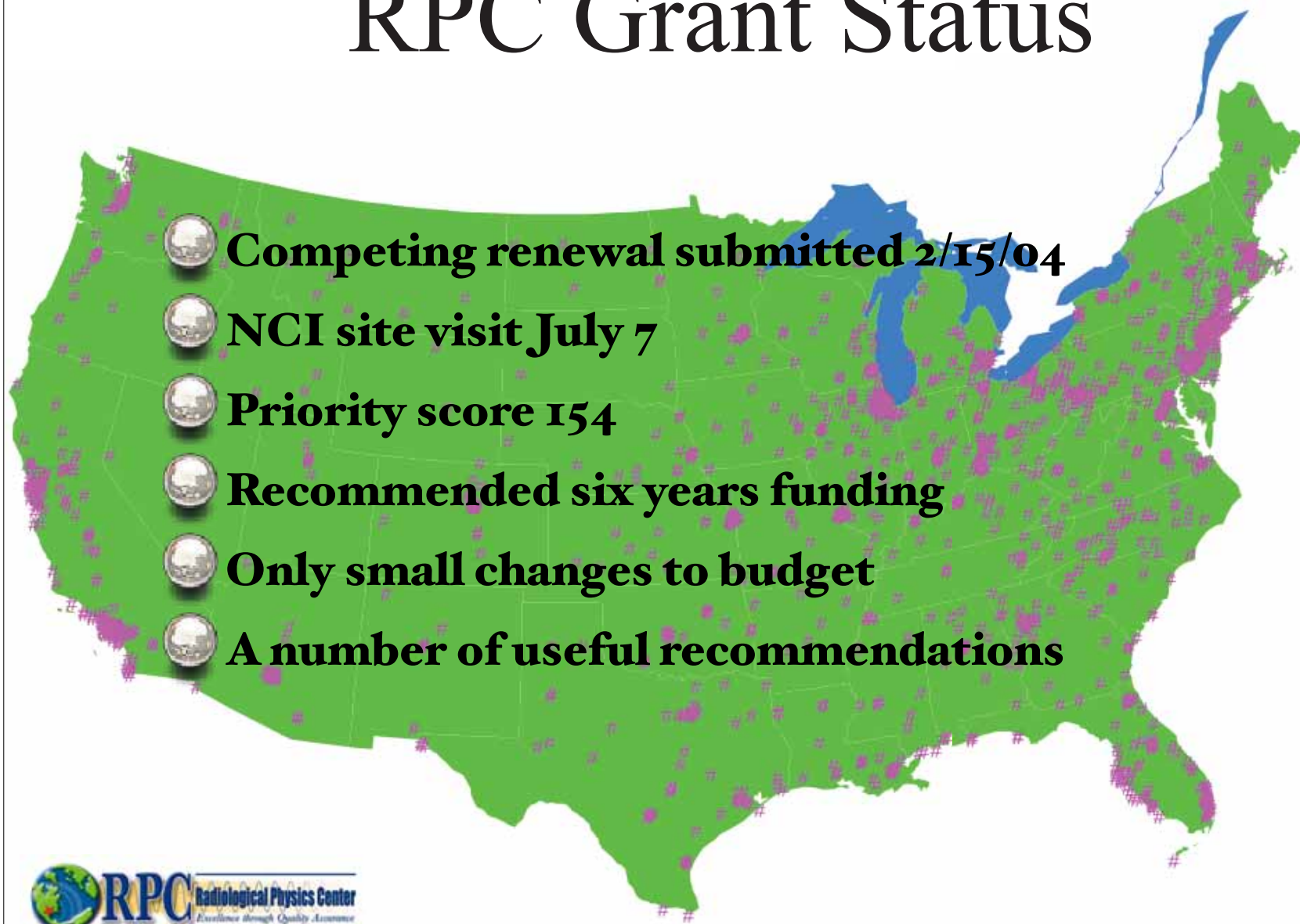
Phoenix, AZ

Paola Alvarez, MS,

David Followill, Ph.D.

Geoffrey Ibbott, Ph.D.

RPC Grant Status



TLD Workload

- 🌍 Number of active institutions (1,317)
- 🌍 Increased TLD for phantoms
 - ★ 10/1/04 discontinued routine measurement of electron depth dose
 - ★ Will measure %dd for new machines (all energies) and for repeat measurement of output

TLD Irradiation Jig for TomoTherapy Units



Credentialing Programs

Benchmarks

-  NSABP/RTOG PBI
-  LDR Prostate Brachy
-  HDR Prostate Brachy

Phantoms

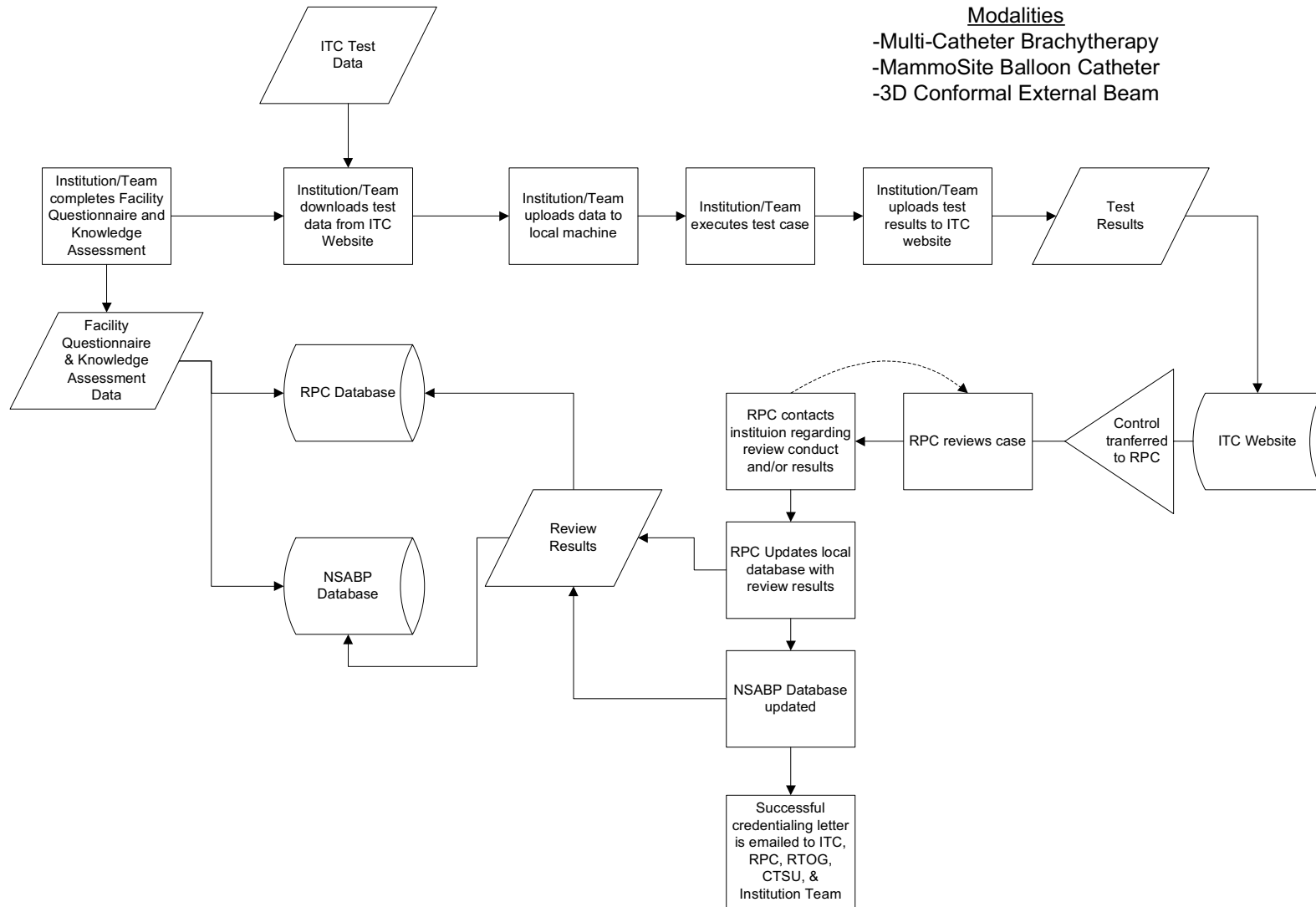
-  H&N
-  Pelvis
-  Lung
-  Liver

Top Twenty

Rank	Institution	#	H&N Phantom	Pelvis Phantom	Lung Phantom	Prostate Brachy
1	M. D. Anderson	71	√			√
2	Notre Dame, Montreal	67				
3	Cleveland Clinic	51	√			
4	Tom Baker	49	√			
5	Rad Assoc, Sacramento	48	√			√
6	Cross Cancer Inst.	41	√			√
6	McGill Univ.	41	√			
8	U. of Western Ontario	36				
9	Akron City Hosp.	34	√			√
9	TJU	34	√		√	√
11	Med. College Wisc.	33	√			√
12	McMaster Univ.	28				
13	Harvard	27				
13	Cancer Found., Phoenix	27				√
13	Dartmouth	27		√		
16	Wayne State Univ.	25				
16	SUNY, Brooklyn	25				
16	Univ. of Maryland	25	√			√
16	Univ. of Rochester	25	√		√	√
16	Roswell Park	25				√

B-39 Credentialing Process for each PBI Modality (Draft)

- Modalities
- Multi-Catheter Brachytherapy
 - MammoSite Balloon Catheter
 - 3D Conformal External Beam



ITC RRT - Case: 0413cmulti - User: www-ibbott (SSL) - v.05011101

-149.82 cm

-150.13 cm

-150.43 cm

-150.73 cm

-151.02 cm

-151.32 cm

SLICE: -151.02 CM ZOOM: 2

Update Image Edit Contours Contour Colors

Isodose Contours Plan: fx1

4 Gy 4.5 Gy Gy

3 Gy 2 Gy Gy

Structures (dashed when isodoses are displayed) All Off

All On

ON 1.5 cavity exp ON ITC_SKIN

Image Click Mode Re-Center

Window/Level

Preset: Default (soft tissue)

Window: 470

Level: 20 Update

Struct: 1.5 cavity exp Eval DVH

1.5 cavity exp

Plan ID	Vol ≥ Ref	Max	Min	Mean
Plan1	0.00 %	9.84 Gy	2.31 Gy	4.42 Gy

Total Volume: 91.35 cc

Click on Plan ID for plan summary.

EXIT

PBI Credentialing Status - Treatment Planning Systems

Vendor	System	Ver.	Exch. Format	3DCRT Export	PBI-3D Import	HDR Brachy Export	PBI-HDR Import
CMS	Focus/XiO	3.1	R	✓	In progress	(✓)	In progress
Elekta	RenderPlan		R	✓	Contacted		
	PrecisePlan	2.01	D	✓	In progress		
Nomos	Corvus		R				
Nucletron	Helax TMS		R	✓	Contacted		
	TheraplanPlus		R	✓	In progress		
	Plato RTS	2.62	D	✓	YES		
	Plato BPS	14.2.6	D			✓	YES
Philips	Pinnacle ³		R	✓	YES		
	AcqPlan	4.9	R	✓			
Rosses	Strata Suite	4.0	R				
RTek	Piper	2.1.2	R				
Varian	Eclipse	7.1	D	✓	YES		
	Variseed	7.1	D				
	Brachyvision		(D?)			(✓)	YES

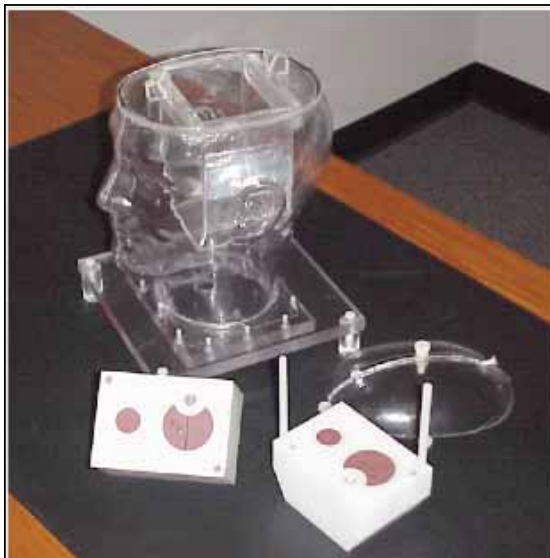
RPC Phantoms



Pelvis IMRT



Thorax SBRT



H&N IMRT



SRS

IMRT H&N Phantom Results

 125 irradiations were analyzed

 86 irradiations passed the criteria

 38 institutions irradiated multiple times

 39 irradiations did not pass the criteria

 15 irradiations under analysis

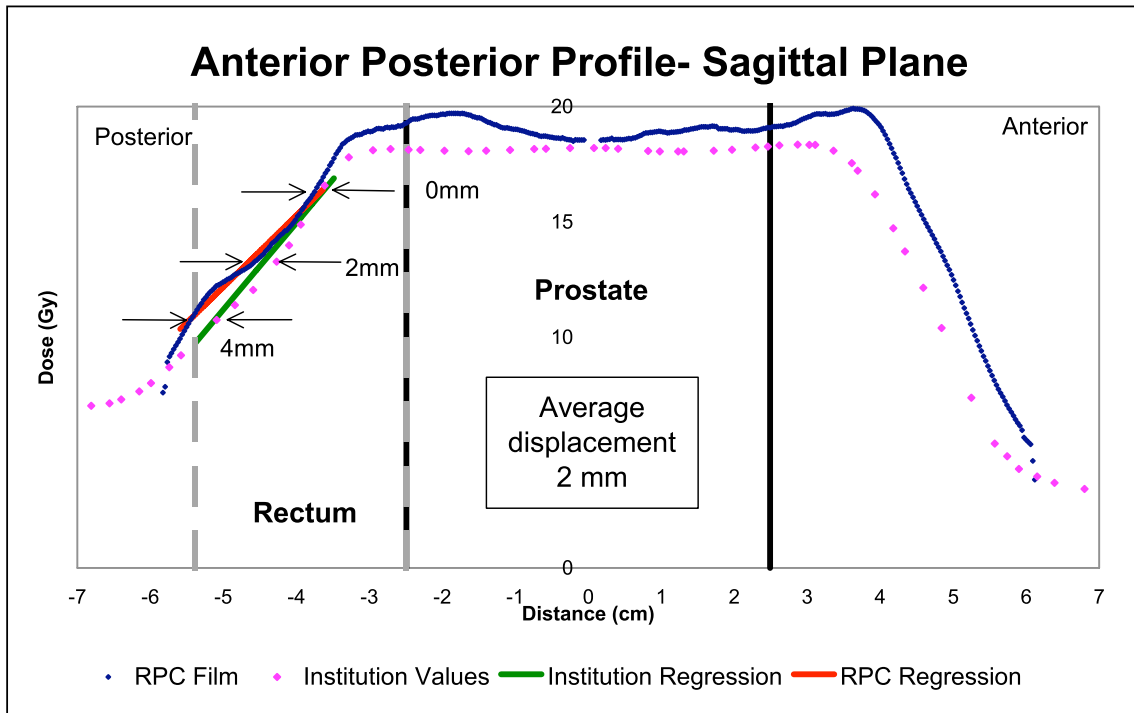
 111 institutions are represented

Only 66% of institutions passed the criteria on the first irradiation.

Explanations for Failures

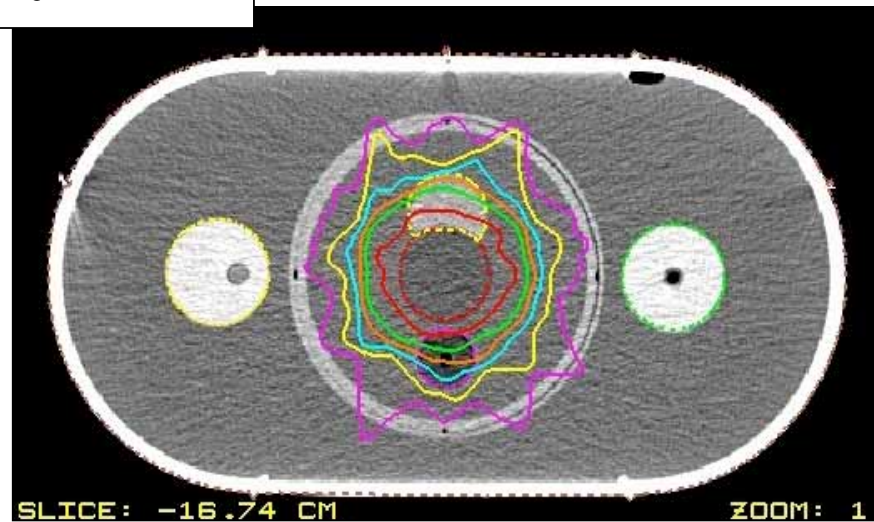
- **Incorrect data in planning system**
 - **Output factors, %dd**
- **Inadequacies in beam modeling (Cadman, et al; PMB 2002)**
- **Not adjusting irradiation time according to measurements**
- **Errors in indexing Peacock system**
- **Setup errors**

Pelvis Phantom Results

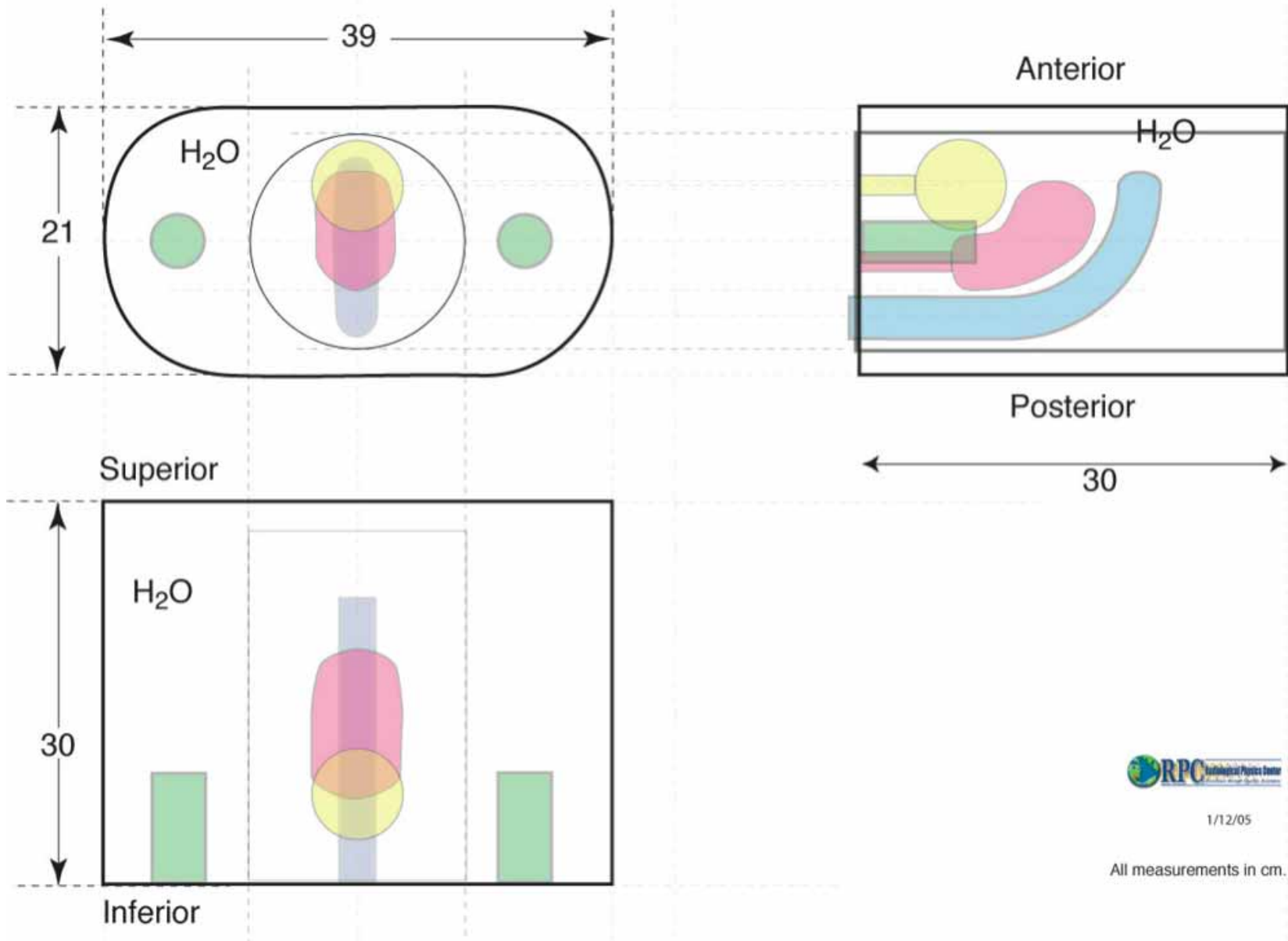


**21 institutions
have
irradiated
phantom**

**15 institutions
have passed,
2 have failed**



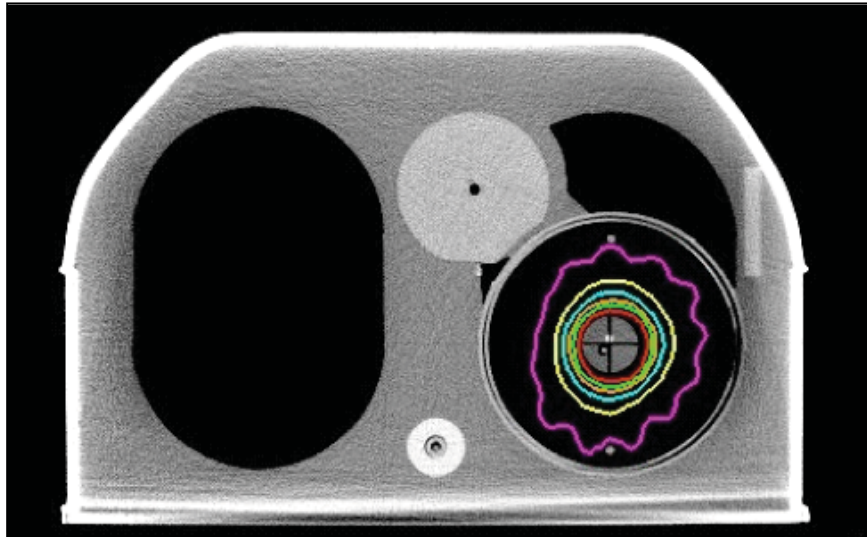
GYN Phantom Model



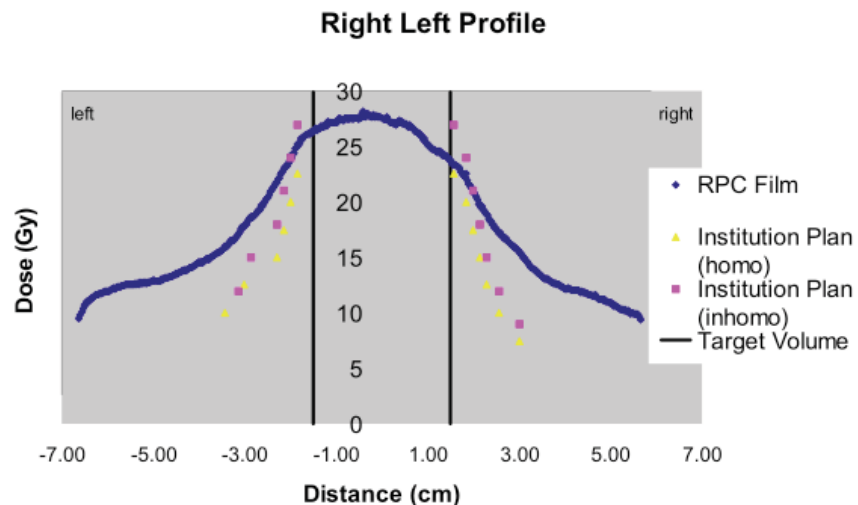
1/12/05

All measurements in cm.

RTOG 0236 SBRT lung protocol



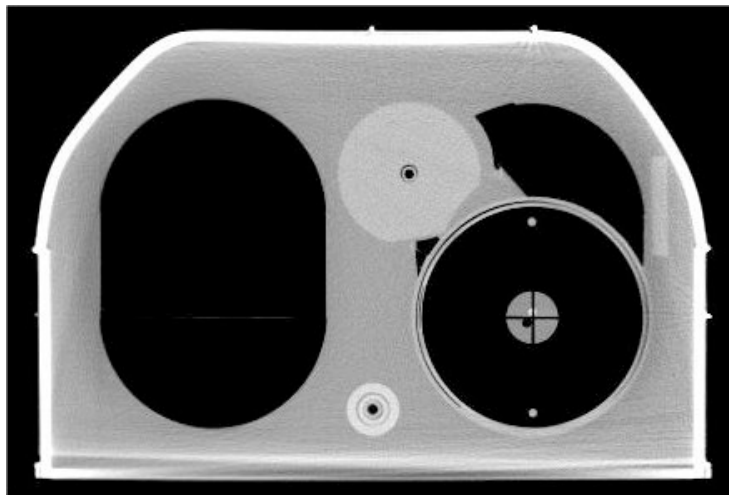
- 3 lung phantoms available now
- 12 institutions have irradiated phantom
- criteria developed (approval at RTOG)
- 7 institutions waiting to receive phantom



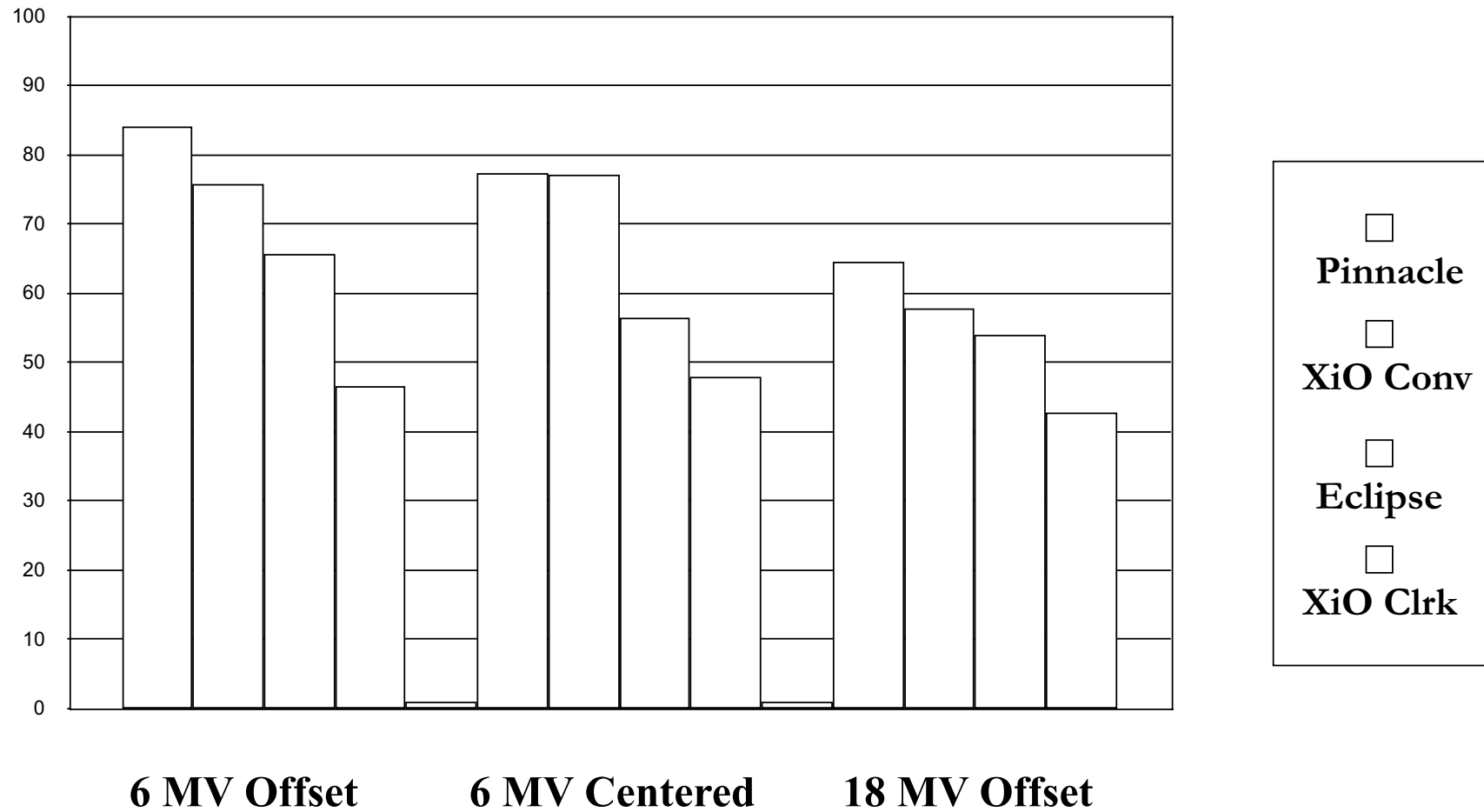
TLD Results

Measured / Calculated

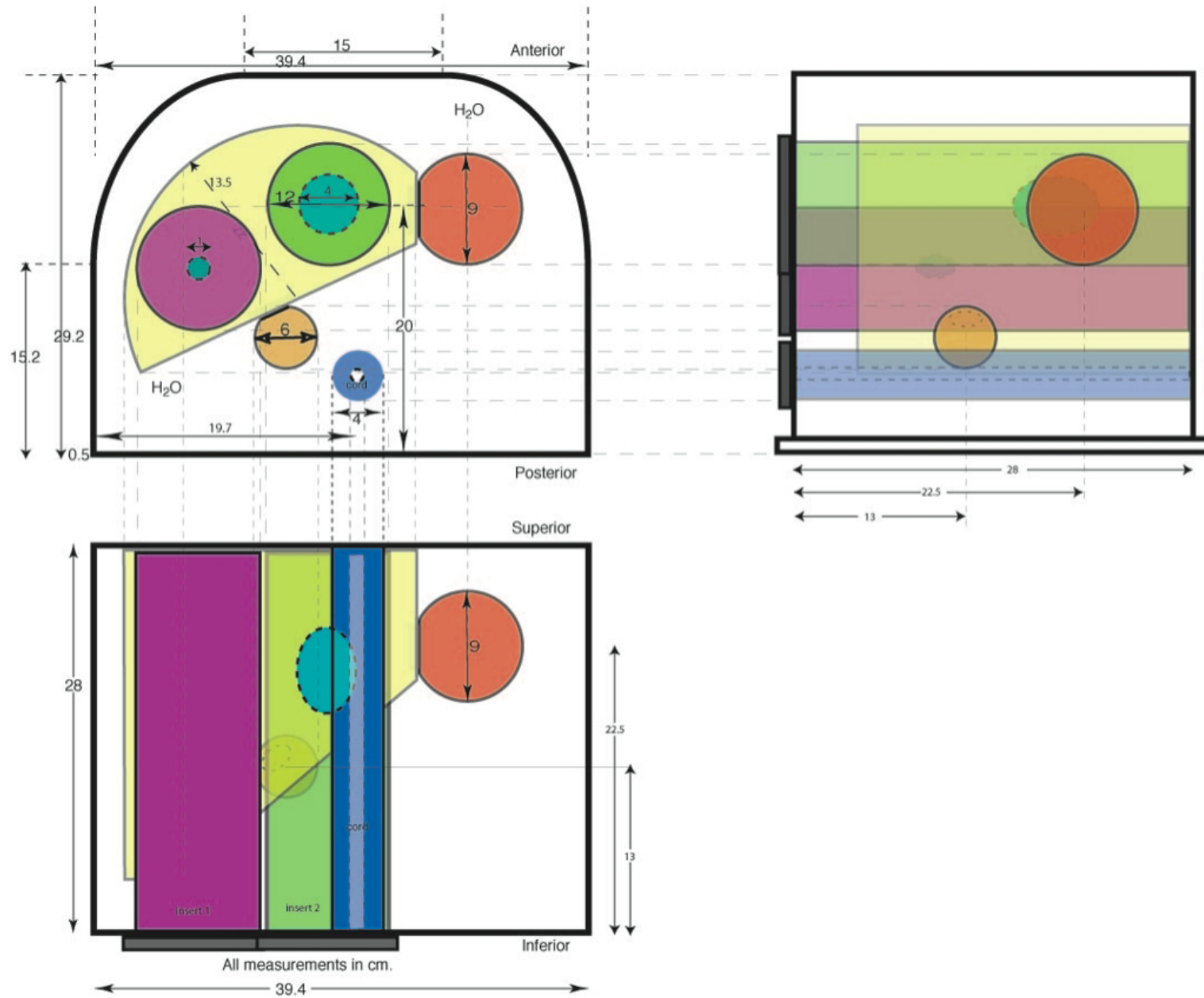
Plan / Energy	Pinnacle	XiO MGS	Eclipse	XiO Clarkson
Center 6 MV	1.022	0.981	0.957	0.925
Offset 6 MV	1.017	0.978	0.965	0.919
Offset 18 MV	1.038	1.030	1.012	0.960

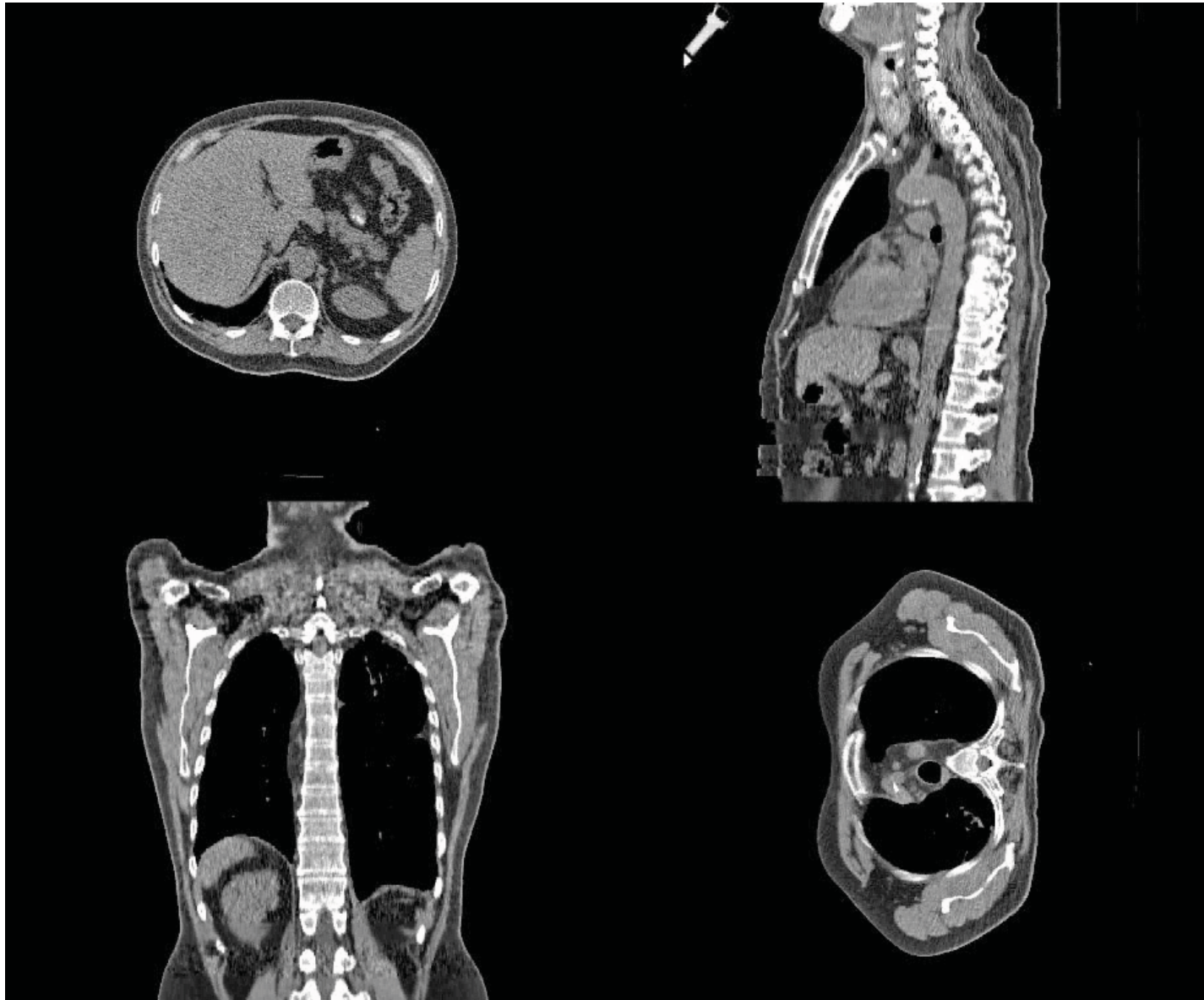


Results - Binary Comparison



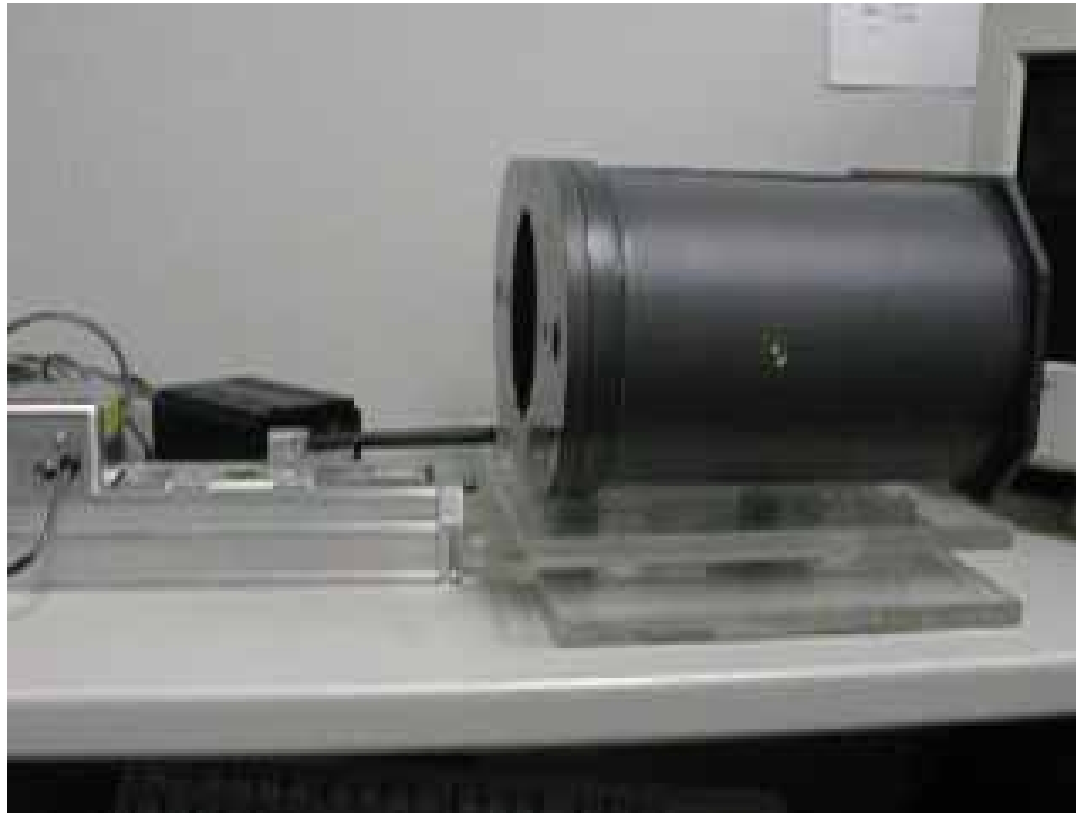
Liver Phantom Model



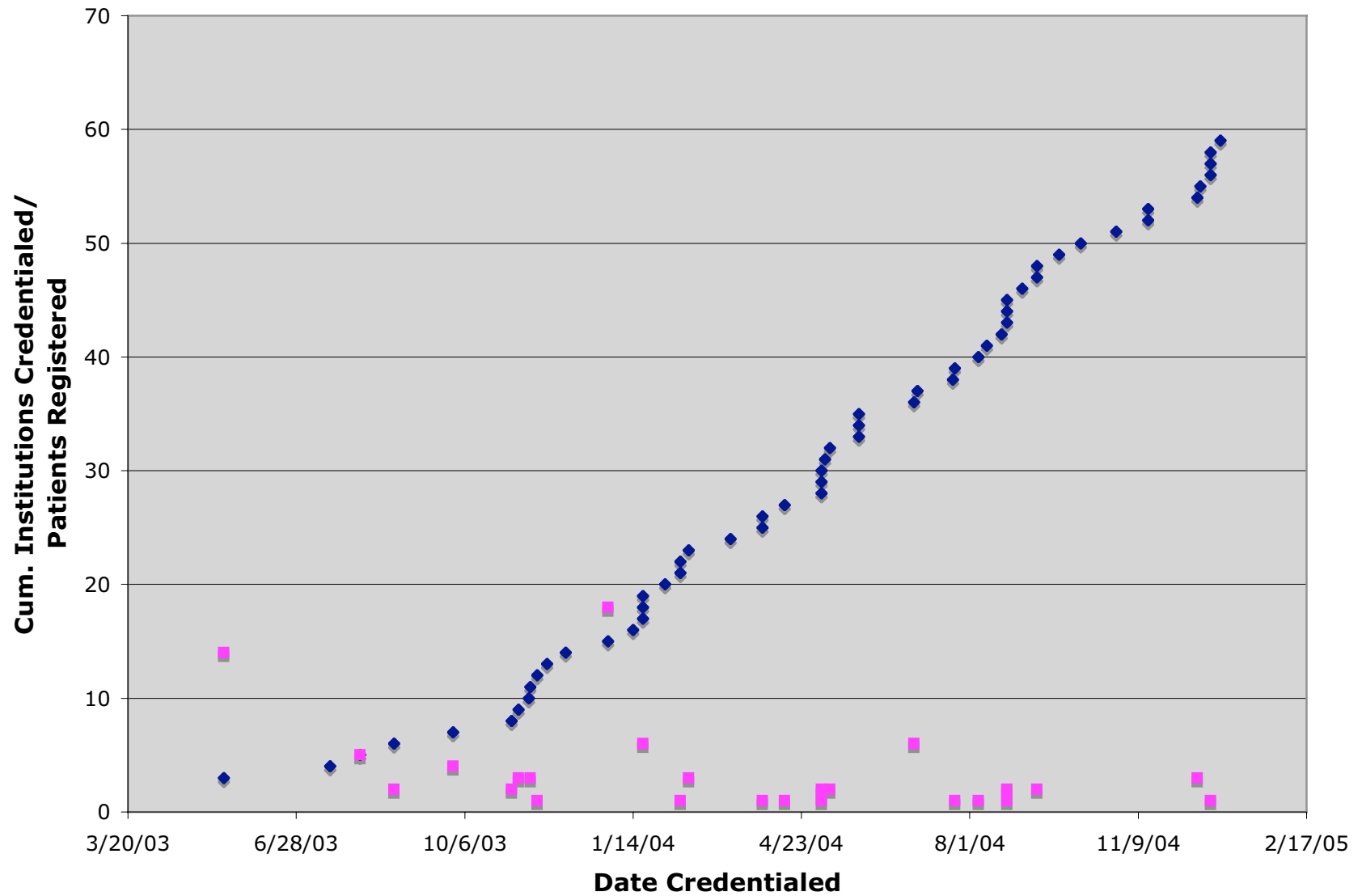


MDACC: M. Fitzpatrick, T. Guerrero

Reciprocating Table



Prostate Brachytherapy 0232 Credentialing



Criticisms of 0232 Credentialing Procedure

- ★ Procedure is “onerous”
 - Physicist completes questionnaire
 - Benchmark plans require several hours
 - Completion time as low as 3-5 days, when submissions are complete

- ★ Forms too long/complex
 - Additional questions requested by QARC, perhaps can be deleted
 - Could reduce “white space”

Other Issues

BrachySys

1/14/05 - Notified new version ready

1/18/05 - Problems with install -
asked to postpone

DoseQA

Gary Gluckman coming to Houston
Feb 2 to install

