

Principal Investigator's Report Advanced Technology QA Consortium

**RTOG Meeting – Chicago, IL
June 25, 2009**

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for**

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“Advanced Technology QA Center”**

Acknowledgments

The Advanced Technology QA Consortium is a team effort, supported by NIH U24 Grant CA81647, “Advanced Technology QA Center”. The individuals listed below have made significant contributions to this work.

NCI: James A. Deye, Ph.D. (Project Officer)

ITC: James A. Purdy, Ph.D. (Principal Investigator), Walter R. Bosch, D.Sc., Jeff M. Michalski, M.D., William L. Straube, M.S., John W. Matthews, D.Sc., Joe Deasy, Ph.D. Roxana J. Haynes, R.N., Anna Eccher, Monica Fairbairn

QARC: Thomas J. FitzGerald, M.D., Marcia M. Urie, Ph.D., Kenneth Ulin, Ph.D., Richard Hanusik

RPC: Geoffrey S. Ibbott, Ph.D., David Followill, Ph.D., Andrea Molineu, M.S., Jessica Lowenstein, M.S., Irene Harris, B.S., CMD, Paola Alvarez, M.S., Joye Roll, B.S., CMD, Huy Duong, B.S.

RTOG: Walter J. Curran, M.D., Jim Galvin, Ph.D, Elizabeth Martin, CCRP, Lorraine Quarles, Brenda Young

ATC Grant Objectives

The goals for the ATC as specified in the RFA are to be accomplished through the following **developmental, coordination, and service objectives**:

1. Eliminate duplication of infrastructure developmental efforts and facilitate sharing of QA resources among cooperative groups.
2. Help to insure that appropriate and uniform QA procedures and criteria for advanced technology trials are developed across all cooperative groups.
3. Facilitate/help manage the uniform credentialing of institutions for advanced RT trials.
4. Facilitate/manage digital data protocol submission.
5. Facilitate/manage the QA review of submitted data.
6. Further development of methods for rapid analysis of volumetric treatment planning data.
7. Assist clinical trial Coop. Groups in development of clinical trials including: (a) credentialing requirements; (b) TV definitions; (c) QA procedures; and (d) data submission instructions.
8. Develop, implement, and maintain innovative methods for electronic exchange of digital planning data between institutions participating in clinical trials and between QA Centers.
9. Develop, implement, and maintain innovative web-based software tools to facilitate protocol digital data reviews by Study Chairs, Dosimetry Groups, RPC, and QARC.
10. Develop, implement, and maintain archival treatment planning and QA databases that can be linked with the cooperative groups' clinical outcomes databases.
11. Demonstrate understanding of and ability to achieve compatibility with existing software and electronic health record standards, including caBIG and DICOM RT.

ATC P.I.'s Report

- P.I. Transition Plan
- Protocol Case Accruals
- Feedback from ATC Steering Committee TCon held May 19, 2009
- Feedback from ATC Evaluation Committee
- Harmonization of Clinical Trials Credentialing/QA
- CDRP Updates
- caBIG-ATC Efforts
- Review of Action Items

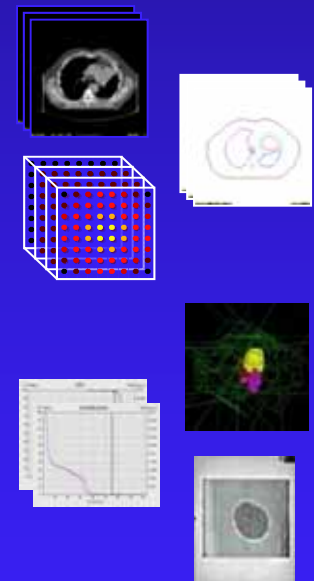
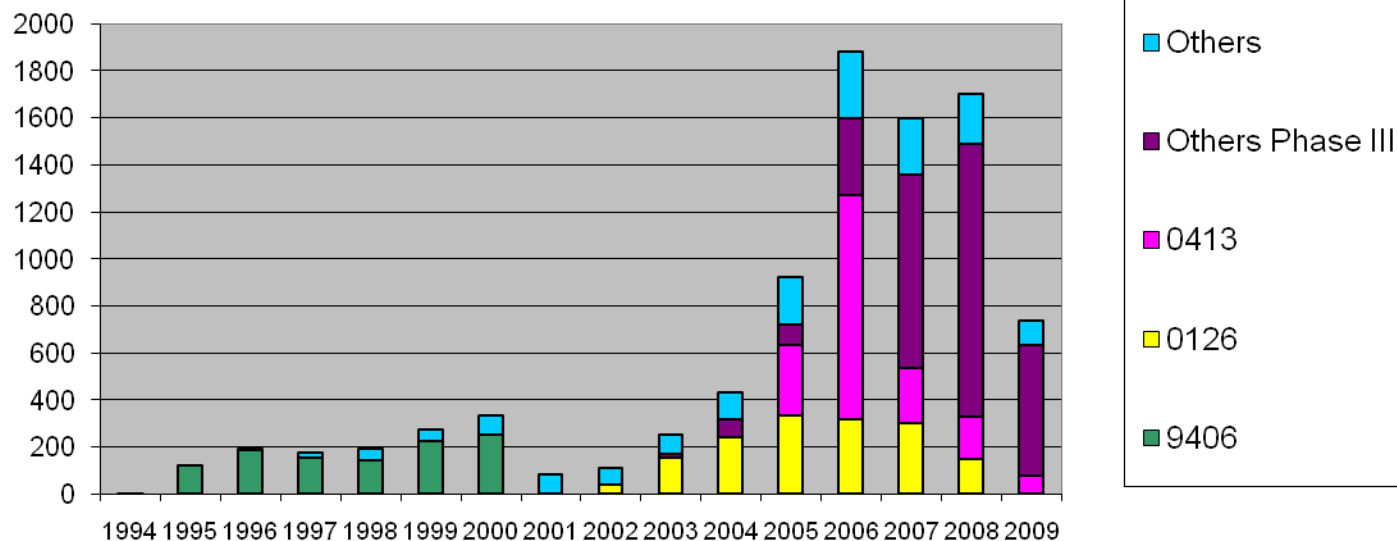
Change in ATC Leadership on July 1, 2009

- Year 11 (July 1, 2009-10): Beginning the 3rd year of the new funding period, Dr. Purdy, will step down as the Director of the Image-Guided Therapy Center (ITC) and as the P.I. for the ATC U24 grant.
- Drs. Bosch and Michalski will serve as co-PIs who will be responsible for the overall direction and coordination of the ITC/ATC efforts and for ensuring that the grant's goals are realized.
- Dr. Purdy will assist Drs. Bosch and Michalski in this effort as a co-investigator.

Protocol Case Submissions

- As of June 15, 2009: 9011 Complete, Protocol-Case, Volumetric Digital Data Sets Submitted Over 16+ Year Period using the ATC QuASA²R System

Annual Advanced-Technology Protocol Case Accruals



- 634 institutions able to submit digital RT data

ITC Special Projects in Support of RTOG

- Uniform Tissue Names for RTOG Adv Tech Trials
 - <http://atc.wustl.edu/resources/index.html>
- Consensus Contouring (El Naqa, Bosch, Deasy)
 - Gyn Working Group: Cervix CTV Atlas
 - Normal Tissue Male Pelvis
 - Normal Tissue Female Pelvis
 - Extremity Sarcoma GTV, CTV

ATC Compliant Treatment Planning Systems Per Modality

- 11 commercial TPS vendors (21 TPSs) have implemented ATC compliant export capability.

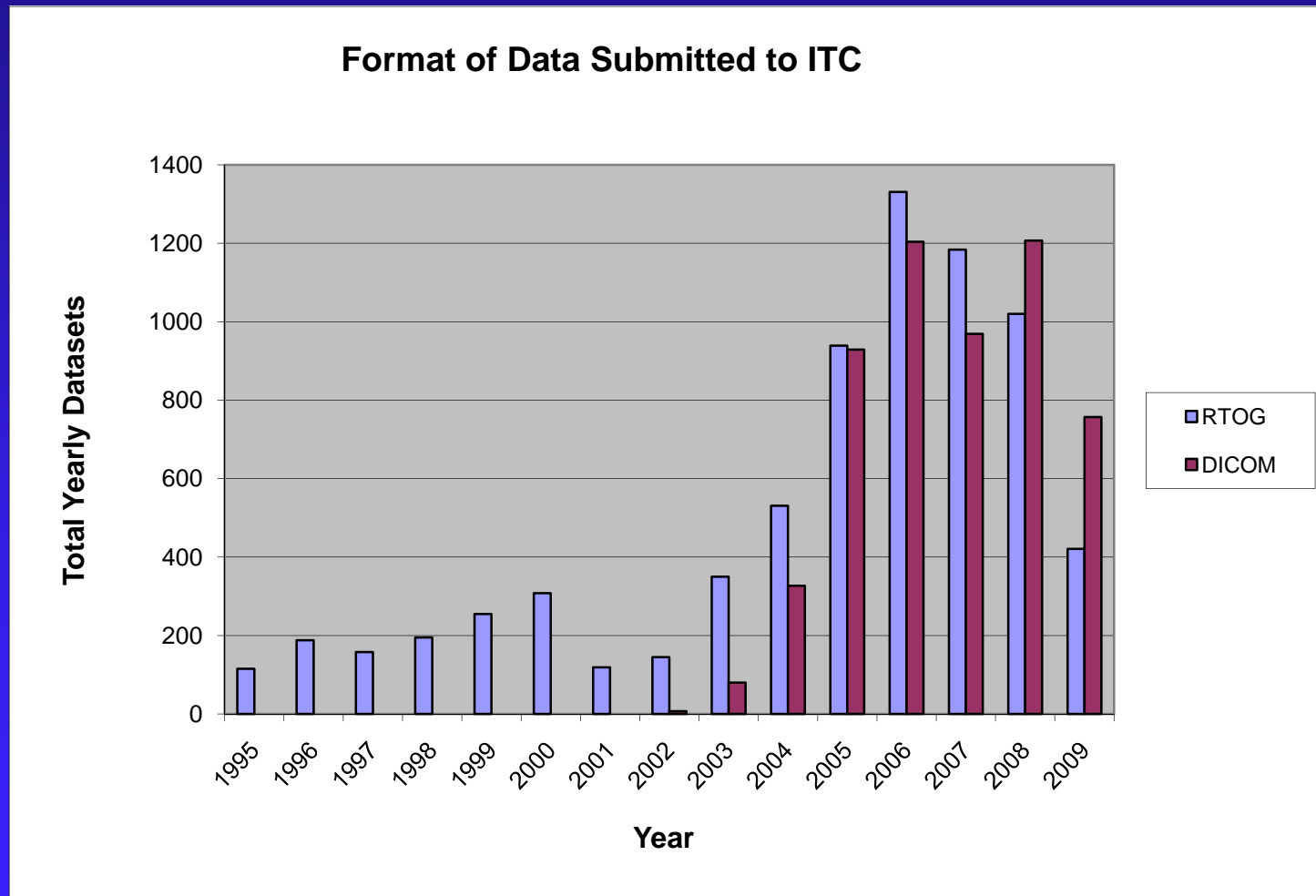
Vendor	Treatment Planning Systems		Exchange Format	Treatment Modality				
	System	Version ¹		3DCRT	IMRT	Seed Brachy	HDR Brachy	Protons
Accuray	MultiPlan	1.5.2	D		✓			
CMS	Focus/XiO	3.1	R	✓	✓	✓		✓
	XiO	4.3.1	D	✓	✓			
Elekta	RenderPlan 3D		R	✓				
	PrecisePlan	2.01	D	✓	✓			
Nomos	Corvus		R		✓ ²			
Nucletron	Helax TMS		R	✓	✓			
	TheraPlan Plus		R	✓				
	Oncentra MasterPlan	1.5	D	✓	✓			
		3.1	D	✓	✓		✓	
	PLATO RTS	2.62	D	✓				
	PLATO BPS	14.2.6	D				✓	
	SPOT-PRO	3.1-00	D			✓		
Philips	Pinnacle ³		R	✓	✓			
	Pinnacle ³	8.0h	D	✓	✓			
	AcqPlan	4.9	R	✓				
Prowess	Panther	4.41	D	✓	✓	✓		
Rosses Medical	Strata Suite CTPlan	4.0	R			✓		
RTek	PIPER	2.1.2	R			✓		
TomoTherapy	Hi-ART	3.0 ³	D		✓			
Varian	BrachyVision	6.5	D				✓	
		(Build 7.1.67)						
	Eclipse	7.1	D	✓	✓			✓
	VariSeed	7.1	D			✓		

ATC Treatment Planning Data Exchange Efforts

- **Progress in ATC Compliant TPS**
 - Nucletron Oncentra HDR – ATC compliant (6/24/09)
 - PlanUNC V6.8.11 – Vendor Complete (5/27/09)
 - Work in progress
 - ◆ BrainLAB iPLAN
 - ◆ Nucletron Ultrasound for Prostate Pre-plan
- **ATC Participation in Standards/Interoperability Efforts**
 - DICOM WG-7 – 2nd Generation RT Objects
 - IHE-RO – Multi-modality Registration Profile, Advanced RT Objects Interoperability Profile
 - caBIG – Clinical Trials Tools Integration RT Use Case

QuASA²R – Data Submission

- Over 60% of submissions now are DICOM

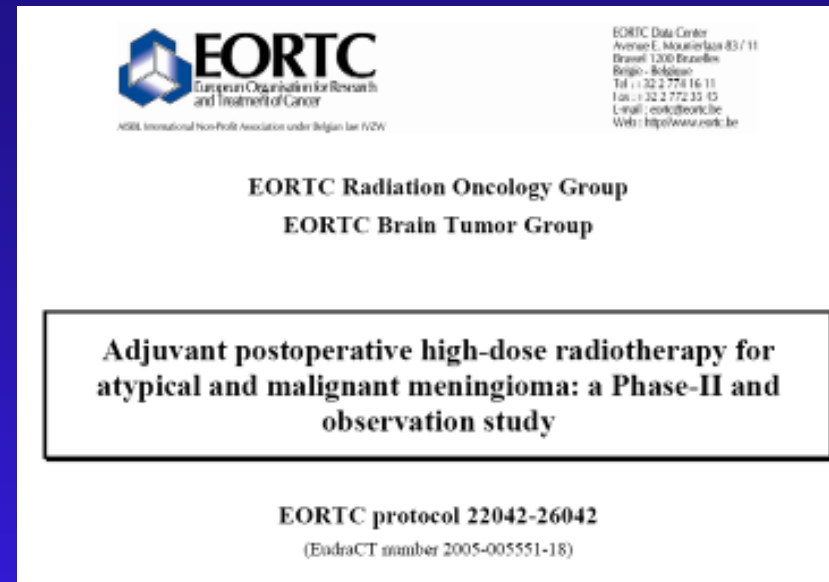


FeedBack from ATCSC and ATCEC

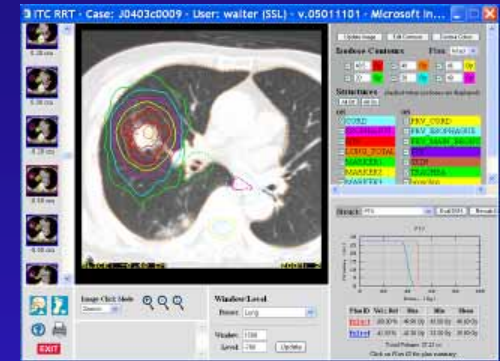
- Feedback from ATC Steering Committee TCon held May 19, 2009
- Feedback from ATC Evaluation Committee

ATC(ITC) Support for EORTC Trials

- **EORTC Protocol 22042:** Adjuvant postoperative high-dose RT for atypical and malignant meningioma: a Phase-II and registration study;
- Damien C. Weber, MD (Study Coordinator) - Hopital Cantonal Universitaire De Geneve, Geneve
- Opened: 2007; accrual goals - 64;
- 19 institutions credentialed; 12 patients registered to study.
- Institutions participating in EORTC protocol 22042 submit digital data representing CT images, structure sets, treatment plans, 3D dose distributions to ITC in St. Louis for processing and DDIQA.
 - PCQA review performed by Dr. Weber or his delegate using the ITC Remote Review Tool.



ATC(ITC) Support of JCOG Clinical Trials



- Study Closed: JCOG 0403: SBRT (48Gy in 4 fx over 4-8days) for medically inoperable Stage IA NSCLC, Endpoint: 3-yr overall survival, Sample size: 165
- Participating institutions submit digital data (CT images, structure sets, treatment plans, 3D dose distributions)
- Dr. Satoshi Ishikura, Director of the Radiotherapy Support Center, Tokyo, JAPAN reviews data using the ITC Remote Review Tool.
- 14 institutions eligible to enroll patients on JCOG 0403; 169 patients were registered to study.
- JCOG 0702: Phase I Dose Escalation Study of SBRT in Patients with T2N0M0 Non-Small Cell Lung Cancer (opened: 2008, accrual goals: 60; 14 institutions credentialed. 9 patients registered to study).

Clinical Trial QA Harmonization

- Review *ATC Credentialing/QA Committee* to develop consensus reports on – Lead writers
 - ERDA – Followill
 - IMRT – Galvin / Urie
 - Facility Questionnaire – Straube
 - IGRT – Galvin / Urie
 - Proton Beam Therapy – Ibbott
- Membership: Marcia Urie (Chair) (QARC), Dave Followill (Co-chair) (RPC), Jim Galvin (RTOG), Bill Straube (ITC)
 - Ex-officio: Bosch, Michalski, Deye
- Updated reports and T-con notifications to be communicated to ATC PIs and Project Officer

Proposed ATC ERDA Policy

"The ATC proposes that all institutions applying to participate in an NCI sponsored trial must have successfully completed an ERDA (within the last two years) by a QA facility that is traceable to a National Standard, for all beams that will be used on that clinical trial."

ATC Supports CDRP

Status of all CDRP sites is periodically reviewed – June 15, 2009

Institution	RTF#	Awarded site /mentor	Physician	Physicist	External Beam	Brachytherapy	Credentials
Rapid City Medical Center, Rapid City, South Dakota	1175	Awarded site	Dan Petereit	Richard Crilly	Pinnacle, Tomotherapy	HDR-Nucletron Variseed- prostate seeds,	0126 (IMRT), 0413 3D, 0413 Mammo, 0413 Multi, 0435 IMRT, 0522 IMRT
Riverview UW Cancer Center, Madison, WI	2850	Mentor site	James Welsh	Jeffrey Limmer	Pinnacle, Tomotherapy	LDR–Cs Pinnacle Variseed- prostate seeds	0126 (IMRT), 0225, 0234, 0236, 0421, 0521, 0522
21 st Century Oncology Santa Monica, CA (Formerly Daniel Freeman Memorial Hospital, Inglewood, CA)	2253 (1322)	Awarded site	David Kahn	Eric Frank	CMS	(Variseed , HDR- Brachyvision ABICUS)	Formerly credentialed for 0232, 0413 Mammo , 0321,
USC/Norris Comprehensive Cancer Center	1966	Mentor Site	Oscar Streeter	Melvin Astrahan	Pinnacle	Varian Cad Plan	0522 IMRT, 0413 3DCRT
UPMC McKeesport Hospital, McKeesport, PA	1789	Awarded site	Susan Rakfal	Hungcheng Chen	Eclipse, Pinnacle	Prowess	0413 3DCRT, Approved H&N phantom
Washington Univ. Medical Center	1075	Mentor Site	Jeff Michalski	Dan Low	Pinnacle Eclipse	Nucletron Variseed Brachyvision	0117, 0126 (IMRT), 0225, 0232, 0234, 0236, 0413 Multi, 0413 Mammo , 0413 3DCRT, 0421, 0521, 0522, 0617, 0618

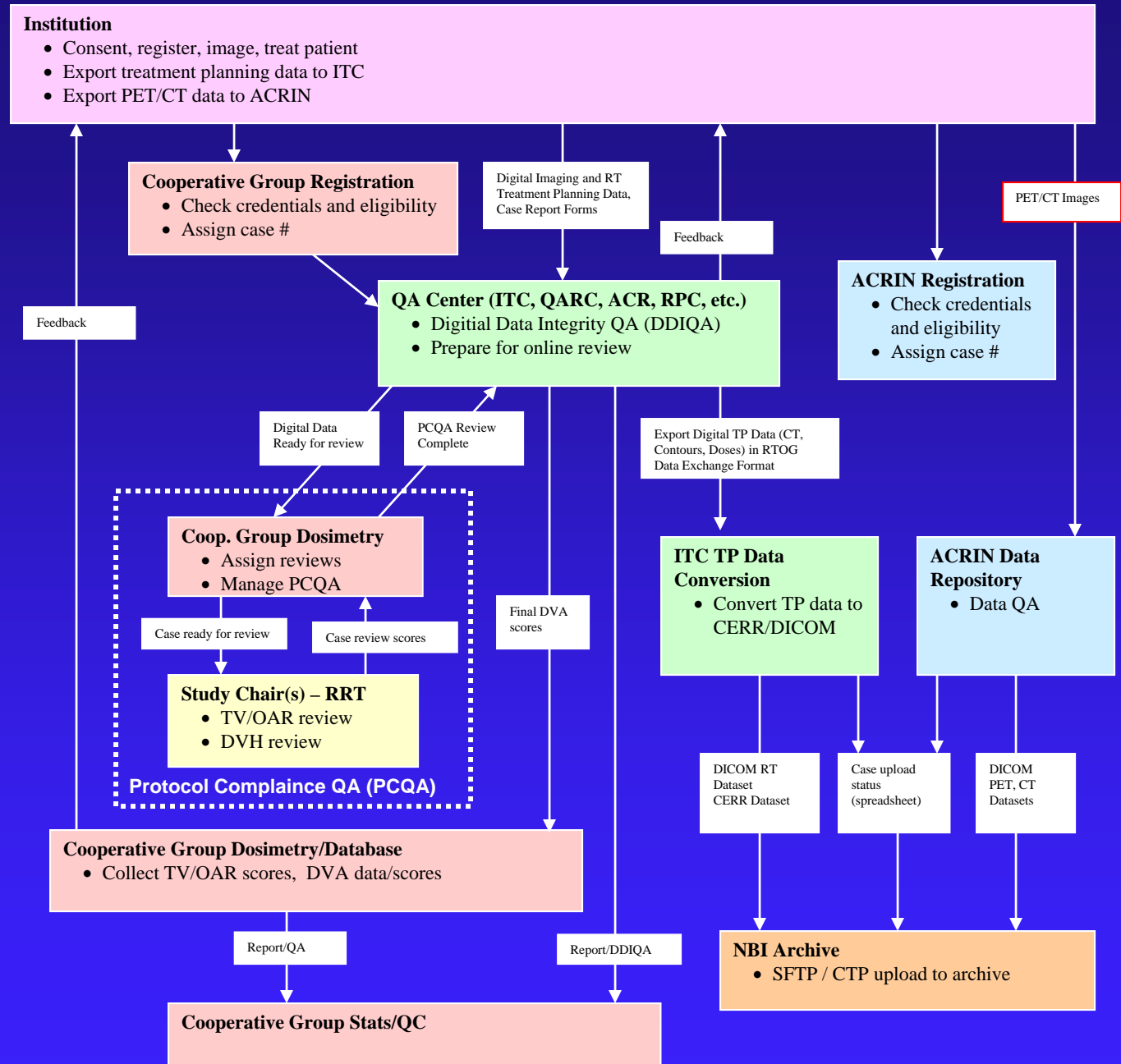
ATC Supports CDRP

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New Hanover Regional Medical Center, Wilmington, NC	1948	Awarded site	Martin Meyerson	Scott Urquhart	Pinnacle	Variseed	0232, 0522 IMRT, 0413 3DCRT
Univ. of North Carolina Hospitals	2608	Mentor Site	Carolyn Sartor	Kathy Deschesne	PLUNC – in house sys.	Plato – HDR	0117, 0126 (Grandfathered), Updated software is ATC compliant using DICOM
Singing River Hospital Regional CC, Pascagoula, MS	2298	Awarded site	W. Sam Dennis	Dennis Wood	Eclipse	LDR ROCS, HDR Brachyvision, Variseed – prostate seeds	0126 IMRT, 0234 IMRT, 0413 3DCRT
University of Alabama, Birmingham, AL	2582	Mentor Site	Sharon Spencer	Richard Poppo	Eclipse	ROCS, Eclipse	0126 (IMRT), 0225, 0413 3D 0234, 0421, 0521, 0522, 0617

caBIG Use Case Data Flow

- Modeled after RTOG 0522 / ACRIN 4500.
- Work in progress to identify caBIG tools and infrastructure that can aid in data collection, QA, and analysis.



Action Items - ATC Steering Committee Response

- Will depend on RTOG, RPC and QARC to continue to make ACRIN aware of ATC capabilities.
 - It should be noted that Dr. Ibbott is a member of the ACRIN QC committee and is in regular contact with Drs. Bruce Hillman and Mitch Schnall.
 - In the future, reports from Dr. Ibbott regarding these liaisons will be a standing agenda item for all ATC meetings
- Will encourage a high-level meeting with ACRIN leadership to discuss means of increasing collaboration and improving coordination of efforts of mutual benefit.
- ATC will try to enhance the cooperation between the ATC and caBIG, VIEW and ACRIN.
 - We are working closely with the caBIG In Vivo Imaging Workspace.
 - QARC is keeping us informed of the VIEW project
 - In the future, reports from those ATC individuals interacting with these groups will be a standing agenda item for all ATC meetings.

Action Items - ATC Steering Committee Response

- Dr. Purdy has asked ITC, QARC, RTOG, and RPC to put together inventories of pertinent QA or treatment planning data that might be useful for research projects.
- First report of these inventories will be due at April 2009 ATC meeting at the RPC.

Action Items - ATC Steering Committee Response

- ATC is to reassess the types of tests that are done for credentialing.
- ATC is considering developing a more formal relationship with the AAPM subcommittee on clinical trials QA regarding credentialing tests for clinical trials. Need to follow-up with Jean Moran and Art Olch regarding this recommendation.