ATC Principal Investigator's Report
ATC Steering Committee Meeting
Philadelphia, PA
October 26, 2009

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Supported by NIH U24 grant CA81647,
"Advanced Technology QA Center"

ACKNOWLEDGEMENTS

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: Jeff M. Michalski, M.D, (Principal Investigator), Walter R. Bosch, D.Sc. (ITC Director), James A. Purdy, Ph.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., Huy Duong, B.S.

RTOG: Walter J. Curran, M.D., Elizabeth Martin, CCRP, James Galvin, Ph.D., Ying Xiao, Ph.D., Lorraine Quarles

ATC Specific Aims

ATC • AdvancedTechnologyConsortium
Providing support in quality assurance and data management for radiation therapy clinical trials

Recall, ATC objectives are accomplished through service, developmental, coordination, and educational specific aims.

- **Specific Aim 1 (Service)**: Maintain and manage the current electronic data submission of advanced technology protocol credentialing and case data.
  - ATC *QuASA²R (Quality Assurance Submission, Archive, Analysis, and Review)* system.
- **Specific Aim 2 (Developmental)**: Develop novel web-based remote-review tools that will enhance efficient & effective review of 3DCRT, IMRT, SRS, SBRT, particle, and brachytherapy protocols and address development of future protocol QA processes such as IGRT and ART..
- **Specific Aim 3 (Coordination)**: Assist cooperative groups in development and management of AT clinical trials protocols including tumor/target volume and organ at risk definitions; credentialing requirements and evaluation criteria; electronic data submission requirements /instructions; QA review procedures.
- **Specific Aim 4 (Educational)**: Serve as an educational resource to the nation's clinical trial cooperative groups and participating institutions fo support of advanced technology radiation therapy clinical trials.

Image-Guided Therapy Center — An Advanced Technology Clinical Trials QA and Support Center

RTOG Radiation Therapy Oncology Group

RPC

QARC Quality Assurance Review Center

ATC Standing Committee (Coordination Efforts)

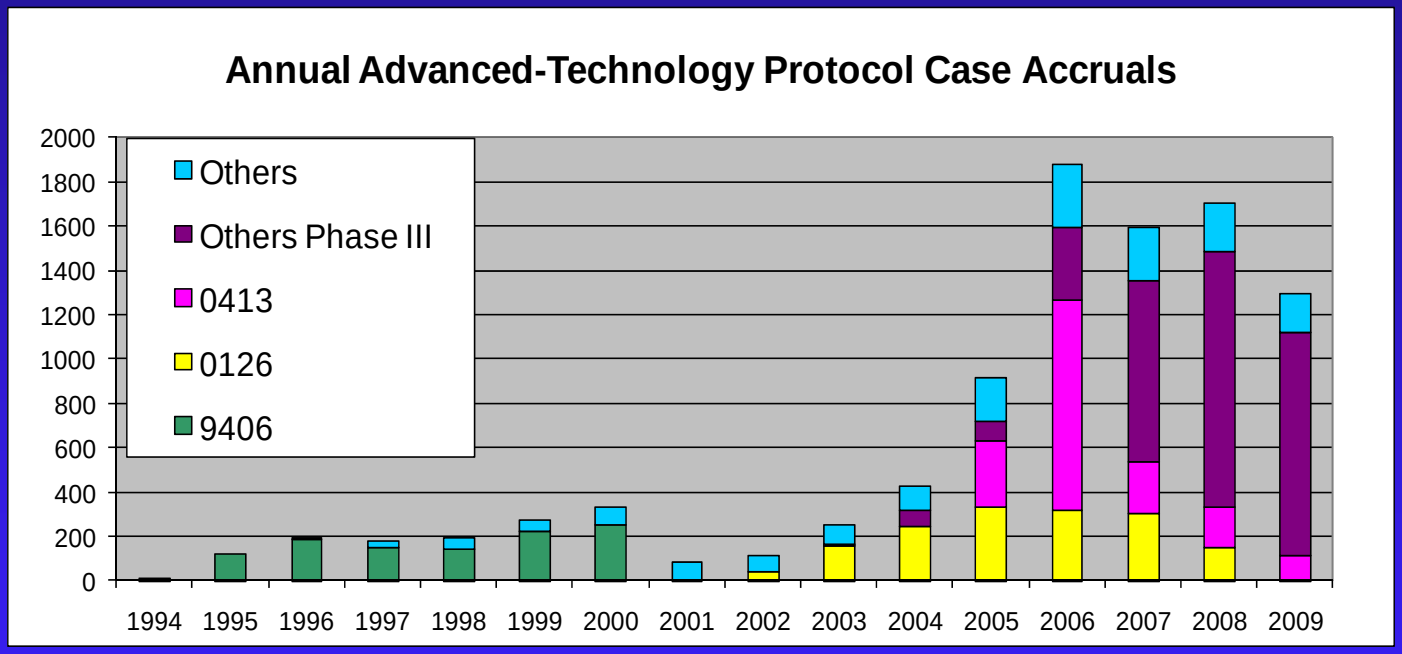
- Appointed *ATC Credentialing/QA Committee* whose mission is:
  - promote uniformity in credentialing/QA across cooperative groups (one of the specified goals of the ATC)
    - credentialing requirements
    - target volumes, OAR definitions, dose specification
    - QA procedures
    - data submission instructions
  - assess clarity and correctness (i.e., “setting of the bar”) of credentialing procedures.
  - Major new effort will be development of ATC endorsed IGRT guidelines led by RTOG
- Membership
  - Marcia Urie (Chair), Dave Followill (Co-chair), Jim Galvin, Bill Straube

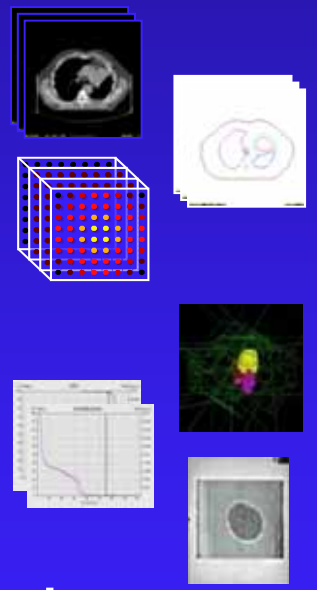
ATC Standing Committee (Coordination Efforts)

- Appointed *ATC Council of Industry Participants* whose role will be to:
  - Interface with ATC Informatics Committee and provide input regarding the latest informatics technology commercially available
  - periodically review and assess the ATC's informatics infrastructure and developmental schedule.
- Current Membership
  - Joel Goldwein, Elekta IMPAC (Chair)
  - Al Lawson - CMS
  - Mike Courtney - Philips
  - Damien Evans - TeraMedica
  - TBN -TomoTherapy
  - Armin Langenegger - Varian

Protocol Case Submissions

- **As of Sept. 21, 2009: 9570 Complete, Protocol-Case, Volumetric Digital Data Sets Submitted Over 16+ Year Period using the ATC QuASA²R System**

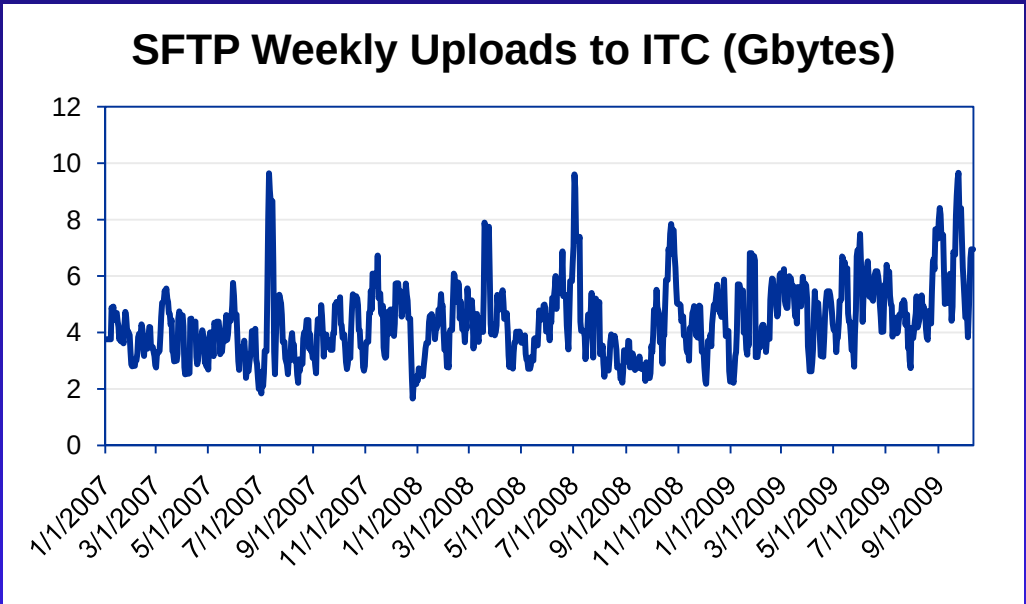


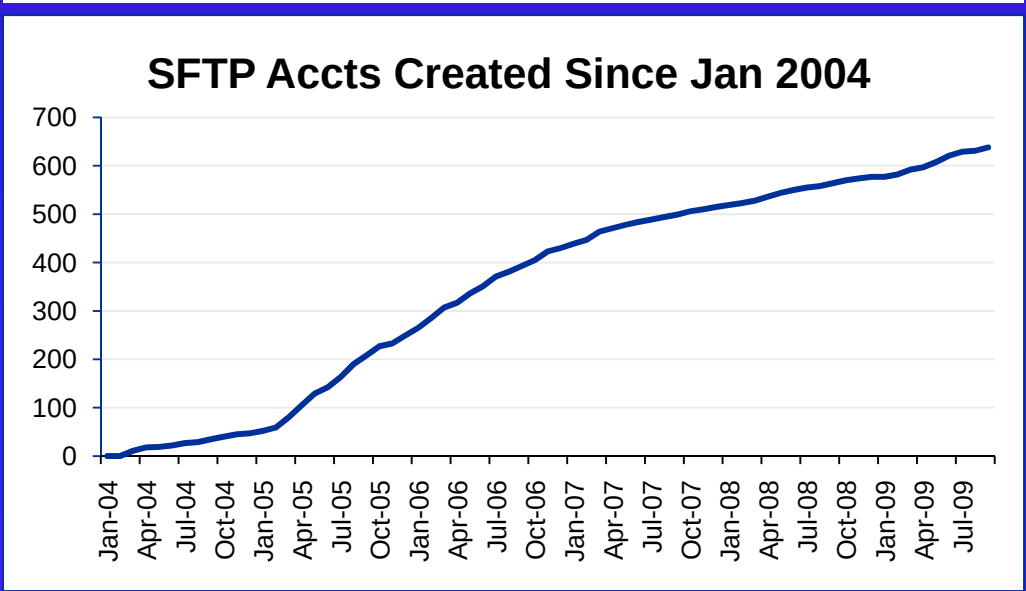


- **11 commercial TPS vendors (22 TPSs) have implemented ATC compliant export capability.**
- **644 institutions able to submit digital RT data**

Data Submissions to ITC

- Approximately 6Gb of treatment planning and image data for advanced technology RT trials are uploaded to the ITC Secure FTP server each week.
- Only a single SFTP account is created per institution.
- The ITC continues to create 60-70 new SFTP accounts per year.





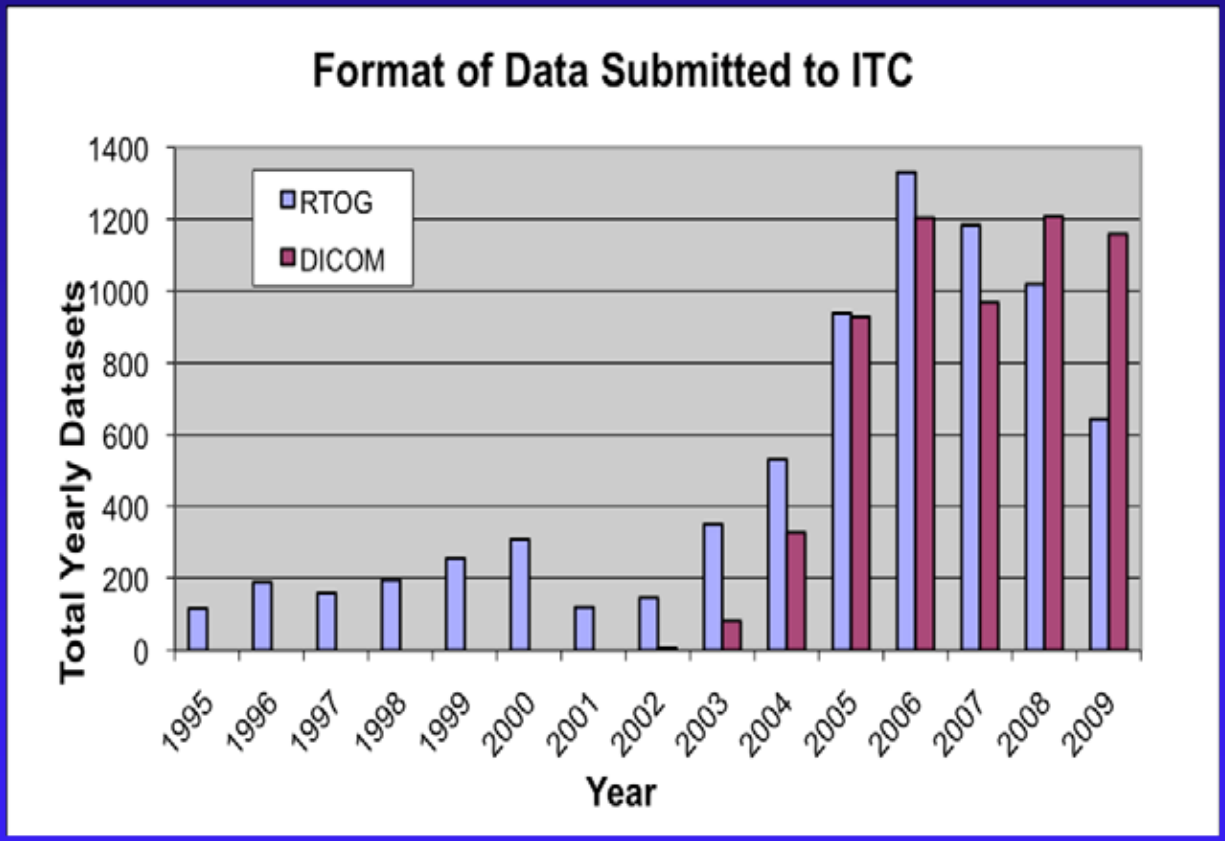
ATC Compliant Treatment Planning Systems

- 11 commercial TPS vendors (22 TPSs) have implemented ATC compliant export capability.
- Prospective users should consult the TPS manufacturer to verify the ATC-compliant data exchange capabilities of the TPS *version* they intend to use for protocol submissions.
- Please consult the ATC Protocols Page for additional credentialing requirements for ATC-supported protocols.

Treatment Planning Systems			Exchange Format	Treatment Modality				
Vendor	System	Version[1]		3DCRT	IMRT	Seed Brachy	HDR Brachy	Protons
Accuray	MultiPlan	1.5.2	D		✓			
BrainLAB	iPlan	4.1[2]	D	✓	✓			
Elekta	CMS Focus/XiO	3.1	R	✓	✓	✓		✓
	CMS XiO	4.3.1	D	✓	✓			
	RenderPlan 3D		R	✓				
	PrecisePlan	2.01	D	✓	✓			
Nomos	Corvus		R		✓[3]			
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 (Build 7.1.67)	D				✓	
	Eclipse	7.1	D	✓	✓			✓
	VariSeed	7.1	D			✓		

RTOG/DICOM TP Data Formats

- Over 60% of data submissions are now in DICOM format.
- The proportion of DICOM datasets is expected to grow as updated TP systems with DICOM export are installed and older versions are no longer supported.



Datasets processed as of Sept. 30, 2009

ATC(ITC) Case QA Review Process

- Protocol specific digital treatment planning data are sent to ITC via SFTP or media.
- Protocol review process now clearly divided between ITC/RTOG
  - ITC is responsible for Digital Data Integrity QA (DDIQA) review which includes review for :
    - completeness of protocol required elements
    - format of data, spatial registration, dose scaling,
    - possible data corruption; and
    - recalculation of all Dose Volume Histograms (DVHs).
  - Coop. Group is responsible for Protocol Compliance QA (PCQA) review which includes review of :
    - TVs and OARs contours compliance
    - protocol dose prescription and dose heterogeneity compliance by cooperative group specific reviewer(s) such as the Protocol Study Chair (SC) using QuASA^{2}R's web-based *Remote Review Tool (RRT)*.

ATC(ITC) Protocol Review Process (Example for RTOG)

- ITC notifies RTOG when a case is ready for PCQA review and RTOG is then responsible for the rest of the review process.
- This clear division of QA review process has made it more efficient for the RTOG to keep track of the status of their protocols for QA reports and data quality reports and to request (and monitor) more effectively any delinquent data from the participating institution.
- Total Number of Protocol Cases/Credentialing/Phantom digital submissions and the number of problems encountered that required human intervention by ITC personnel.

Period covered	Total Number of Protocol cases/credentialing/phantom digital submissions	Number of problems requiring human intervention	% cases requiring human intervention
First half 2007	107	293	27%
First Half 2008	1054	287	25%
First Half 2009	991	338	34%

ATC Support of RTOG Clinical Trials (9/21/09) (Closed Trials)

Protocol	Description	Institutions Credentialed	Cases Accrued
9406	Ph I/II 3DCRT Prostate Dose Escalation	54	1084
9311	Ph I/II 3DCRT Lung Dose Escalation	27	180
9803	Ph I/II 3DCRT GBM Dose Escalation	46	210
0022	Ph I/II 3DCRT/IMRT Oropharynx	35	69
0225	Ph I/II 3DCRT/IMRT Nasopharynx	36	68
0319	Ph I/II 3DCRT Partial Breast	31	58
0321	Ph I/II HDR/Ext Beam Prostate	18	129
0236	Ph II SBRT Lung	8	59
0234	Phase II 3DCRT/IMRT Advanced H&N	230 (51 IMRT)	238 (96 IMRT)
0421	Phase III 3DCRT/IMRT Prev Irrad. H&N*	42	15
0117	Ph I/II 3DCRT/chemo Lung	50	63

ATC Support of RTOG Clinical Trials (9/21/09) (Closed Trials)

Protocol	Description	Institutions Credentialed	Cases Accrued
0435	Ph III 3DCRT/IMRT H&N (Palifermin)	142	21
0515	Ph II NSCLC (Vol definition CTvs PET)	7	50
0529	Ph II IMRT Anal	59	63
0126	Ph III 3DCRT/IMRT Prostate	127 (55 IMRT)	1534 (494 IMRT)
0418	Ph II IMRT Endometrial or Cervix	>234	106
0522	Ph III Advanced H&N	>298	942
0615	Ph II Nasopharynx	>173	46
0521	Ph III High Risk Prostate cancer	>315	613
0438	Phase I ESRT Hepatobil & Liver met	3	24

ATC Support of RTOG Clinical Trials (9/21/09) (Open Trials)

Protocol	Description	Cases accrued/target
0232	Ph III 3DCRT/IMRT vs Seeds Prostate	435/586
0413	Ph III PBI Breast	3569/4300 (1336c, 335m, 100i)
0415	Ph III 3DCRT/IMRT Prostate (Hypo Fx)	1026/1067
0436	Ph III esophagus	81/420
0526	Ph II Salvage Brachy Hi Risk Prostate	20/96
0534	Ph III 3DCRT/IMRT salv postprostatectomy	155/1764
0539	Ph II Meningioma	5/165
0617	Ph III High Dose 3DCRT/IMRT NSCLC	148/512
0618	Ph II SBRT Operable NSCLC	17/33
0619	Ph II Postop H&N	0/170
0621	Ph II Post-prostatectomy + chemo	36/76

ATC Support of RTOG Clinical Trials (9/21/09) (Open Trials)

Protocol	Description	Cases accrued/target
0622	Ph II 3D-IMRT salvage prostate + Sm153	7/76
0623	Ph II SCLC	5/44
0630	Ph II IGRT STS	38/102
0712	Ph IIR Invasive Bladder cancer	5/98
0724	Ph III ChemoRT High Risk Postop Cervix	0/400
0813	Ph I/II Central Lung SBRT	4/94
0822	Ph II IMRT + chemo Rectal Cancer	66/75
0825	Ph III GBM	77/720

ATC Support of RTOG Clinical Trials (9/21/09) (Developing Trials)

Protocol	Description
0628	Ph II IMRT locally advanced rectal cancer
0631	Ph II SRS spinal metastases
0713	Ph III IMRT Breast
0714	Ph III Resectable Pancreas
0715	Ph II 3DCRT recurrent breast
0811	Ph II Intermediate H&N cancer IGRT erlotinib
0814	Ph II Proton beam locally advanced prostate cancer
0816	Ph II HDR prostate brachytherapy
0823	Ph I Lapatinib vs Capecitabine + IMRT pancreatic cancer
0836	4D Imaging for Prostate IGRT
0838	Ph II IMRT + chemo + Cetux Anal Cancer
0848	Ph III Adjuvant Pancreas

ATC support of Other Cooperative Groups

- **NSABP-** B39 (RTOG 0413)-Partial Breast Irradiation
- **NABTT-** N0603 Ph I/II HCQ + XRT/TMZ in GBM
- **GOG-**Three protocols
  - 0238- Ph III XRT +/- weekly cisplatin In recurrent uterine carcinoma
  - 0249- Ph III Pelvic XRT vs Vaginal Cuff BT in Endometrial Carcinoma
  - 0258- Ph III Cisplatin and Tumor Volume Directed XRT for Debulked, Advanced Endometrial Carcinoma
- **EORTC-** 22042 postoperative meningioma
- **JCOG-** Two protocols
  - 0403 SBRT in early stage inoperable NSCLC
  - 0702 SBRT dose escalation in early stage inoperable NSCLC

ATC(ITC, QARC, RTOG) is working with caBIG/NBIA

- ATC is one of the funded participants in the caBIG In Vivo Imaging Workspace.
  - ATC members (ITC, RTOG, QARC) and ACRIN are actively participating in the In Vivo Imaging Workspace.
  - Continue to exploring projects with Emory, QARC, RPC, ITC, ACRIN, RTOG, and CALGB
  - Clinical Trial Enterprise Use Case (RTOG 0522/ACRIN4500 model, Saltz/FitzGerald/Purdy)

Proton therapy

- NCI Guidelines
- RPC
  - Facility questionnaire
  - Measured data (TLD)
  - On site audit
  - Phantom
- QARC support of COG and other trials allowing proton therapy
- RTOG inclusion of protons in select protocols

RTOG 0848 / EORTC 40084-22084
QART program

Sub-study on extent and frequency of ERDA

Coen Hurkmans

clinical physicist

EORTC Radiation Oncology Group
Executive Committee member
QART committee member

Akos Gulyban

medical physicist

RTQA manager

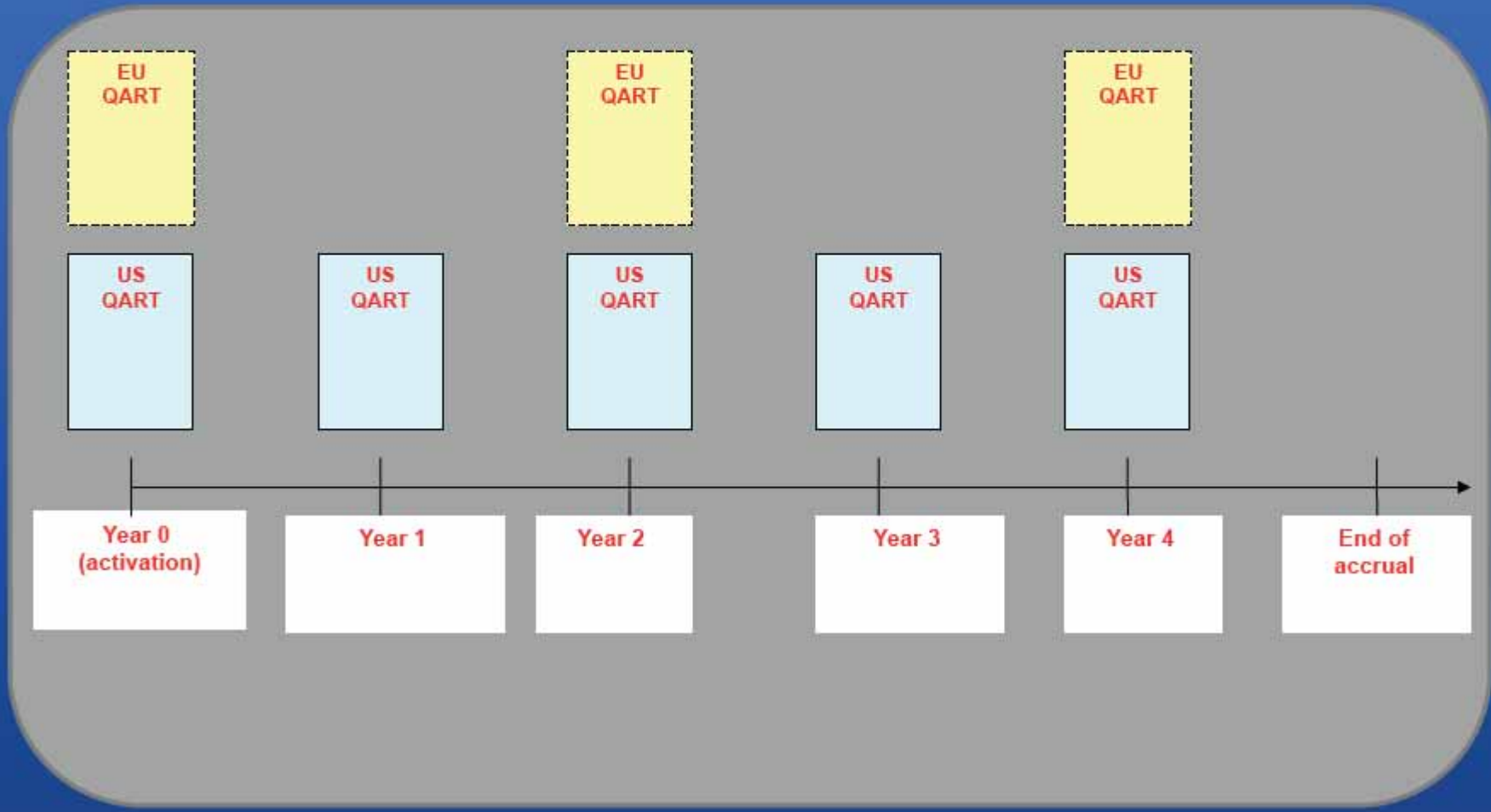
EORTC Headquarters

ATC / RTOG Meeting

2009 June, Chicago, IL, USA

Analysis Plan for ERDA

Measurements



ATC is encouraging requests for secondary analysis using volumetric treatment planning data.

- Data Request Form

Request for Use of ATC Data Form

To: Cooperative Group Chair and ATC, Principal Investigator

From:_____

Affiliation:_____

_____

Date:_____

Protocol Study #(s): _____

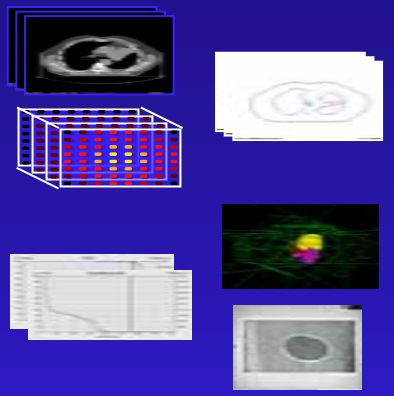
All requests must be accompanied by a research plan for the proposed data use. The research plan must include: names of investigators; objectives; background; type of data requested; and data analysis description.

Specify what data is being requested:

Cooperative Group Approval: Yes___ No___ :Signature_____ Date____

ATC, P.I Approval: Yes___ No___ :Signature_____ Date____

ATC, Sub-Contract P.I. Approval: Yes___ No___ :Signature_____ Date____



Requests from:

- Dr. Jeraj, UW
- Dr. Sharp, MGH
- Dr. Hagan, VA
- A. Basu, NCI-CBIIT

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, has stepped down as the Director of the Image-Guided Therapy Center (ITC) and as the P.I. for the ATC U24 grant.
- Dr. Michalski is PI 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. Bosch is Director of the Image-Guided Therapy Center (ITC)
- Dr. Purdy assists Drs. Bosch and Michalski in this effort as a co-investigator.

ITC Report

Walter R. Bosch, D.Sc.

ATC Steering Committee Meeting

October 26, 2009

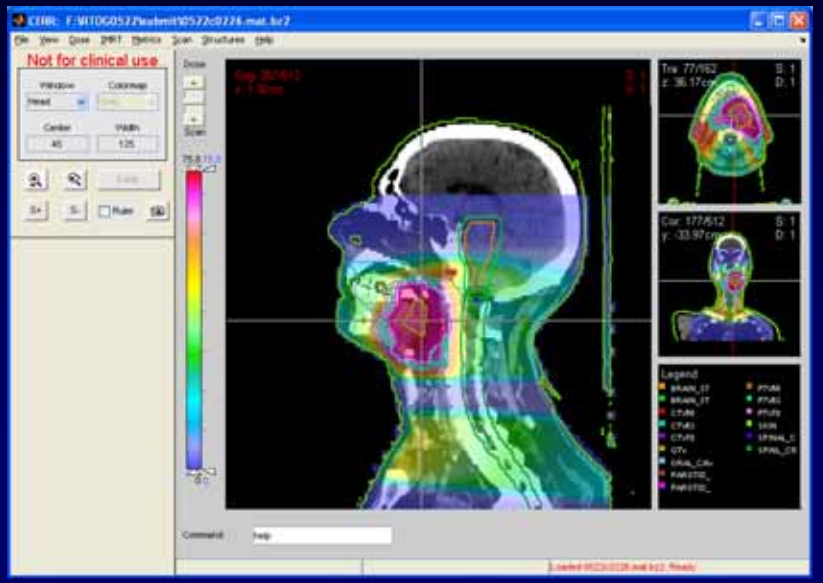
Philadelphia, PA

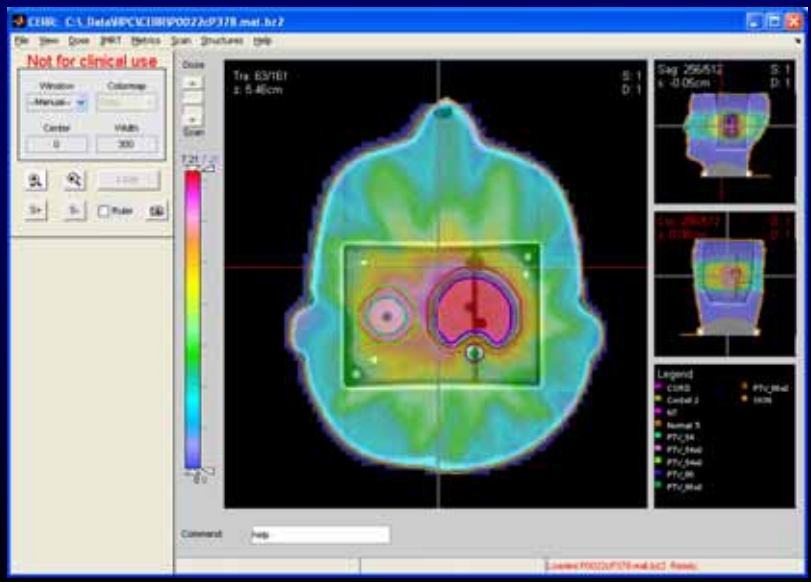
Data Format Conversion using CERR

- Data format conversion: RTOG 0522 TP data export to NBIA as DICOM
- Since April 2008, 605 RPC phantom datasets have been processed by ITC for RPC Phantom Dosimetry Tests using the CERR and FilmQA tools.

RPC Phantom	# Datasets
Head/Neck	349
Lung	164
Prostate	62
Spine	16
Liver	14

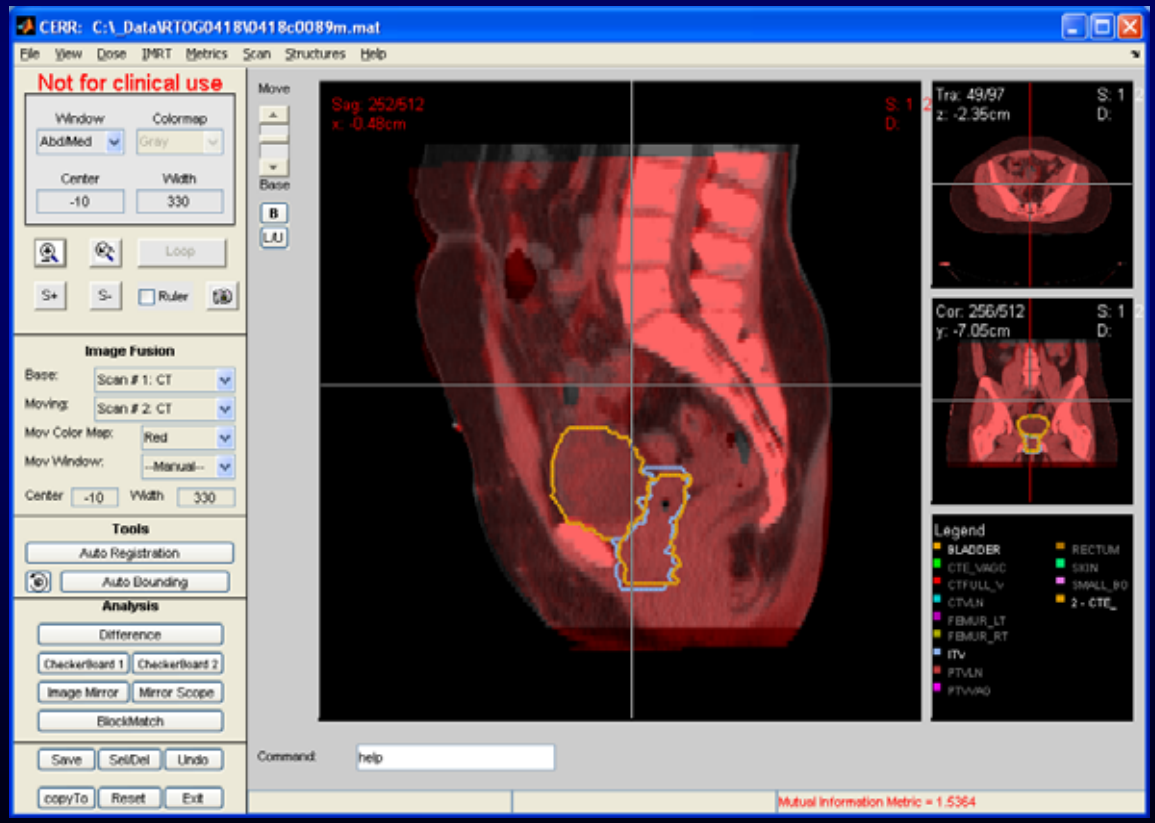
Datasets as of 10/20/2009





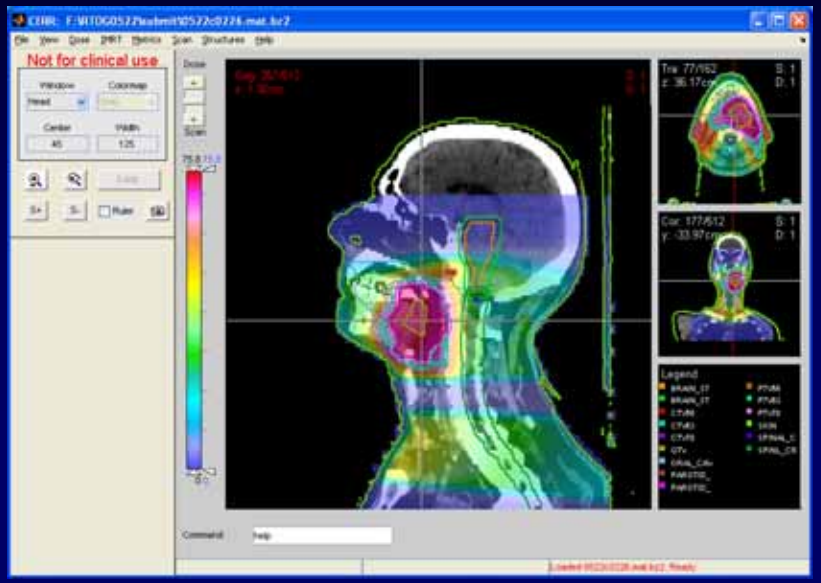
Data Review using CERR

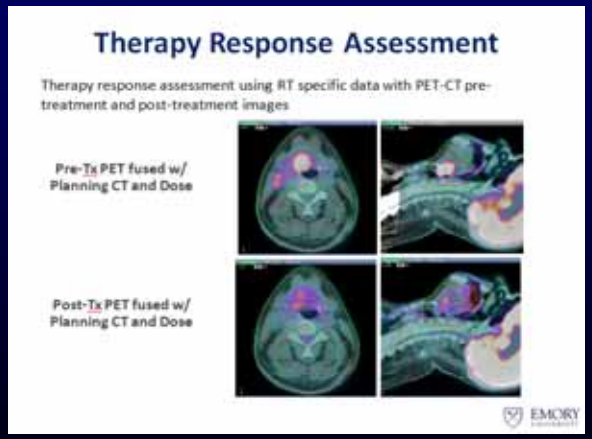
- **RTOG 0418**
  - **Evaluation of ITV using registration of full-bladder (planning) CT and empty-bladder CT scans.**
  - **Multi-planar display**
    - **Images**
    - **Structures**
    - **Dose**
  - **Protocol Case QA using**
    - **CERR**
    - **WebEx**



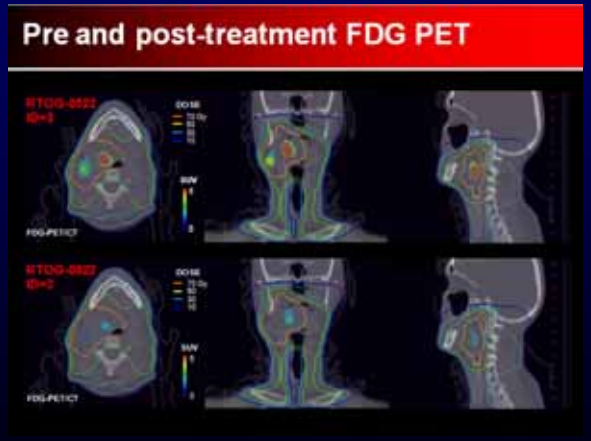
RTOG 0522/ACRIN 4500 NBIA Collection

- RTOG 0522 cases*
  - DICOM CT images, RT Structure Sets, RT Dose are uploaded to NBIA using MIRC/CTP
  - 68 cases uploaded, additional 15 have RT QA complete
- ACRIN 4500 cases*
  - 102 cases with pre-RT PET
  - 89 cases with post-RT PET
  - 87 cases with pre- and post-RT PET





T. Fox

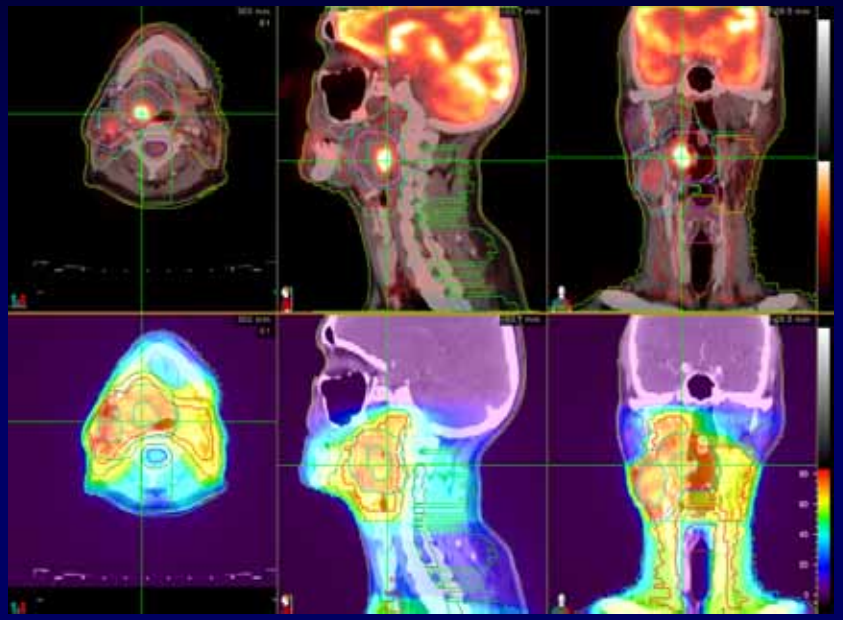


R. Jeraj

* Cases as of 10/23/2009

NCI CBIIT Comparative Effectiveness Database

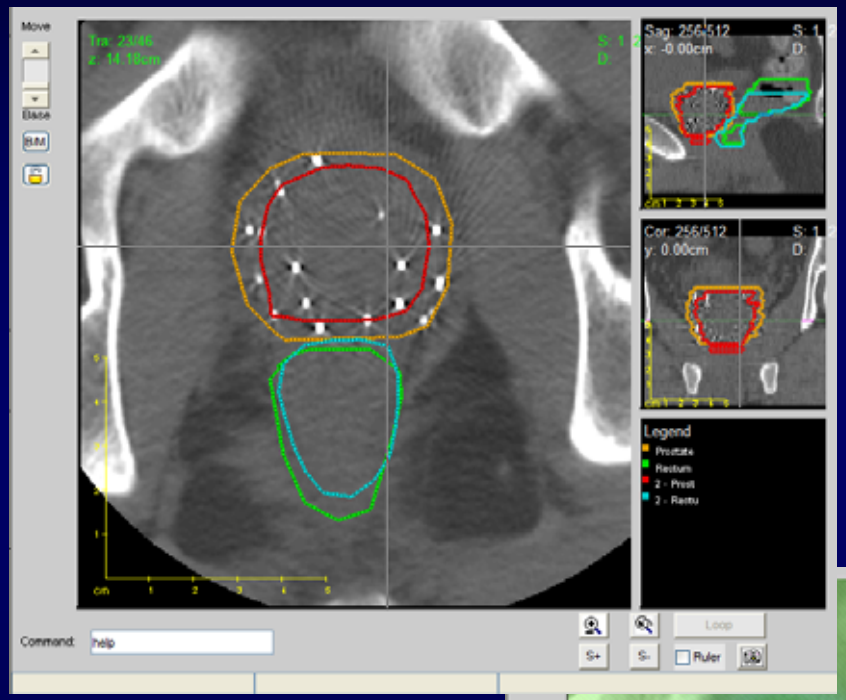
- Demonstration project with caBIG and AHRQ (10 cases)
  - RTOG 0522 RT datasets and ACRIN 4500 pre- and post-RT PET images stored in NBIA
  - RTOG/ACRIN case forms
    - A5 Demographics/Family history
    - I1 Initial Eval Form
    - T1 Radiotherapy
    - I7 Dosimetry
    - IM Local PET Assessment form
    - TA PET/CT Technical Assessment form
- Assess associations between 3D dose distribution and local/regional progression, OAR toxicities.

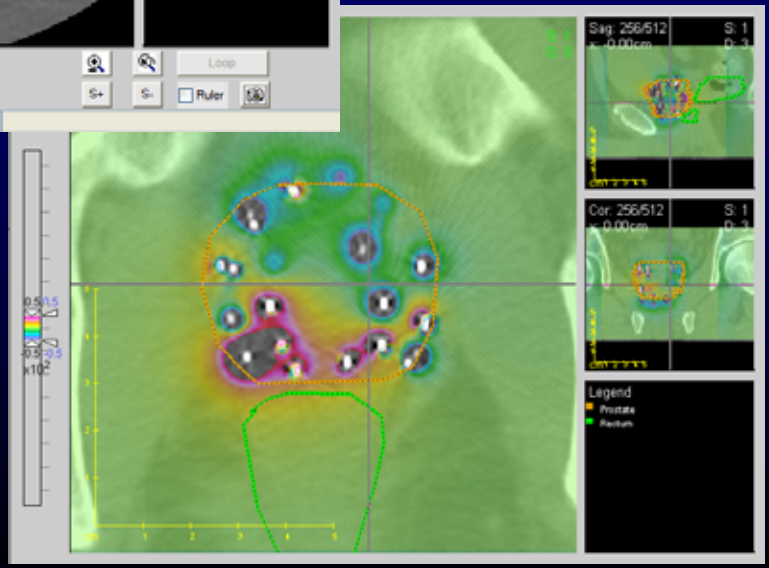


* Cases as of 10/23/2009

Comparison of Survey and Reference Datasets for QRRO Prostate Seed Implant Project

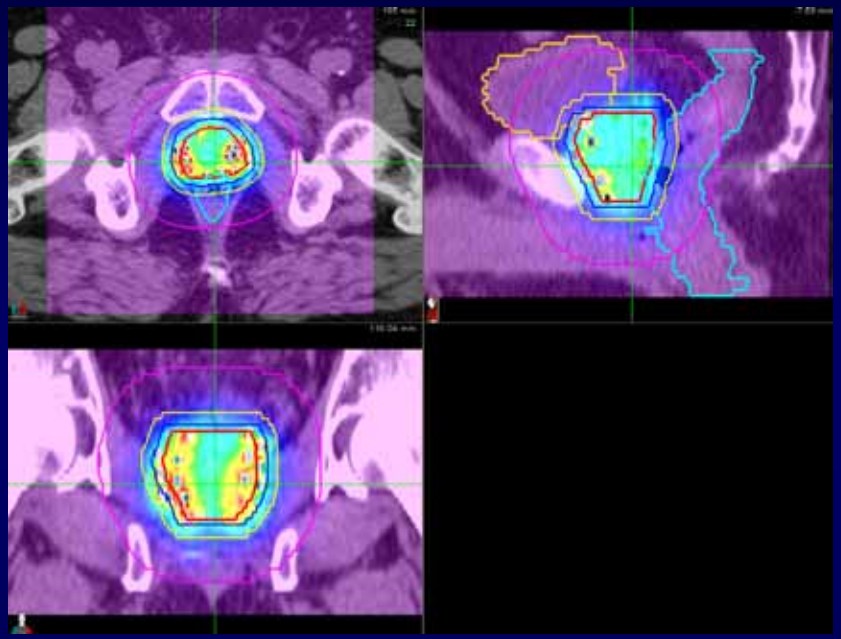
- 150 seed plans datasets from 15 centers uploaded to ITC.
- Referee re-contours target, rectum, urethra; localizes seeds; and re-calculates dose
- CERR used to compare contours and dose distributions of submitted data and re-contoured/re-calculated seed plans.





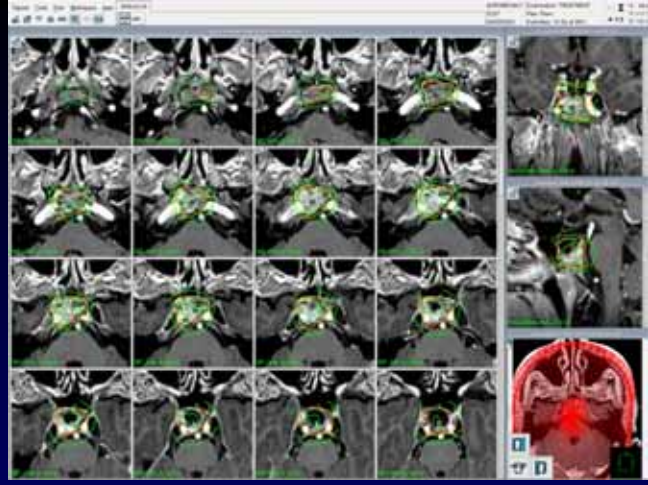
VA Prostate Brachytherapy Dose Metrics Project

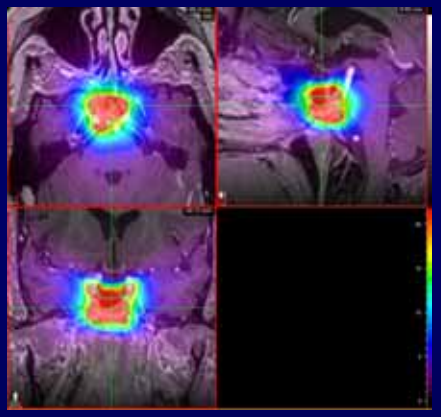
- ITC to compute dose-volume statistics for 100 prostate brachy-therapy cases on recent RTOG protocols with QA scores of evaluable
  - Bladder 0, 5, and 10mm outside ETV
  - Rectum 0, 5, and 10mm outside ETV
  - Unspecified tissue 0, 5, and 10mm outside ETV
- RTOG to review and confirm that selection of cases is an adequate and representative sampling and case QA scores were acceptable
- RPC to confirm institutions were credentialed to participate
- All will participate in preparation and review of documentation and any publishable manuscript

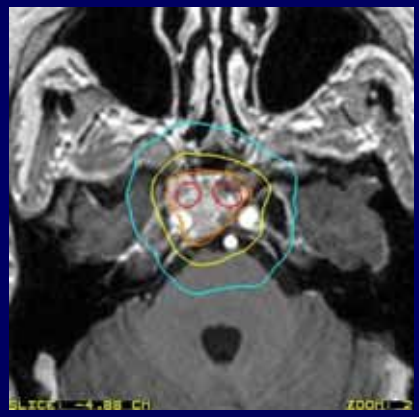


Data Collection for SRS Protocols

- There is an urgent need to collect GammaPlan data for RTOG SRS protocol 0930
- Elekta is implementing DICOM export (CT, RTSS, RTDO) in GP 9.0, but the timetable for widespread clinical implementation is uncertain.
- In the interim, Elekta has made available to ITC software to enable conversion of GP datasets to DICOM:
  - GP 9.0 pre-release for GP 8.3.1 (.lgp) plans
  - Legacy Data Conversion Tool (LDCT 1.1) for GP 4.x and 5.x datasets
- Several GP 8.3.1 datasets have been converted successfully to DICOM
- Work is in progress with R. Drzymala at WU to verify correct operation and develop procedures for export and import of plan data from clinical sites.

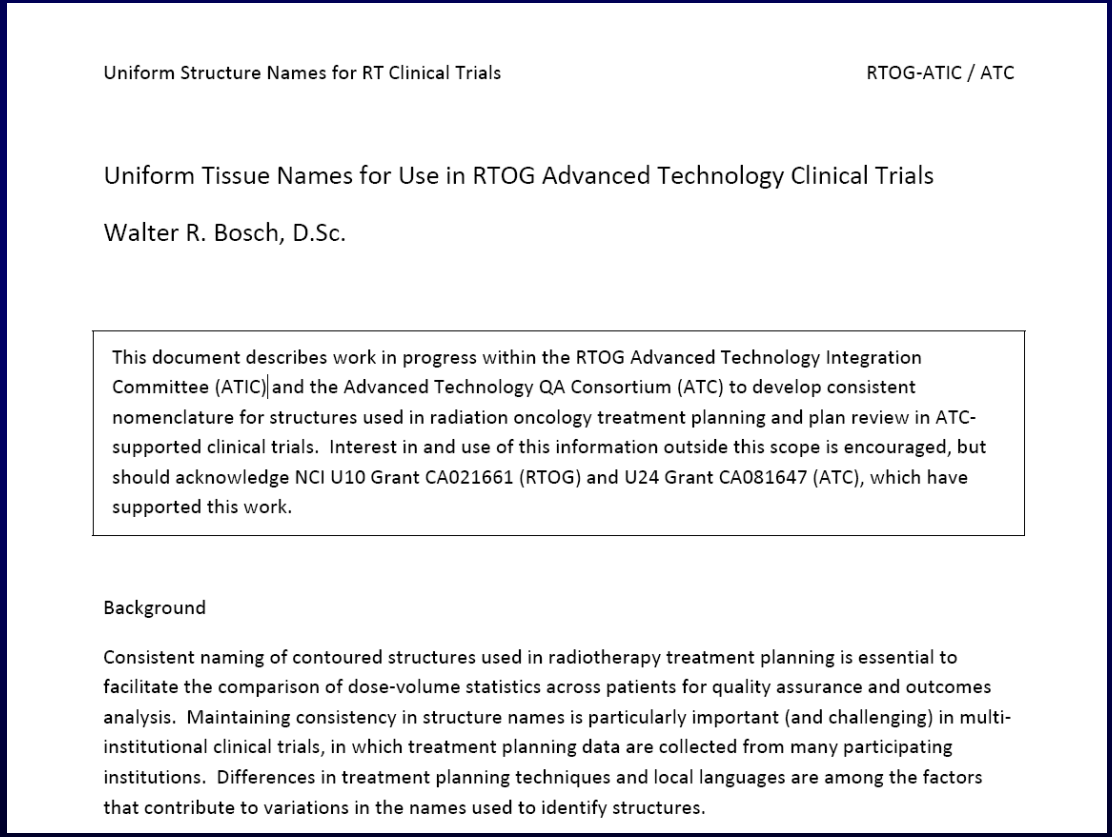






Uniform Structure Names

- Joint effort with RTOG Advanced Technology Integration Committee
  - Base names for OAR derived from structure list used for RTOG advanced technology trials
  - Indicate laterality for paired organs
  - TV names include prescription dose
  - PRV names include margin
- Current version (8/19/09) in use for RTOG protocols 0617, 0631, 0724, 0815, 0825, 0915, 0920



Uniform Structure Names for RT Clinical Trials RTOG-ATIC / ATC

Uniform Tissue Names for Use in RTOG Advanced Technology Clinical Trials

Walter R. Bosch, D.Sc.

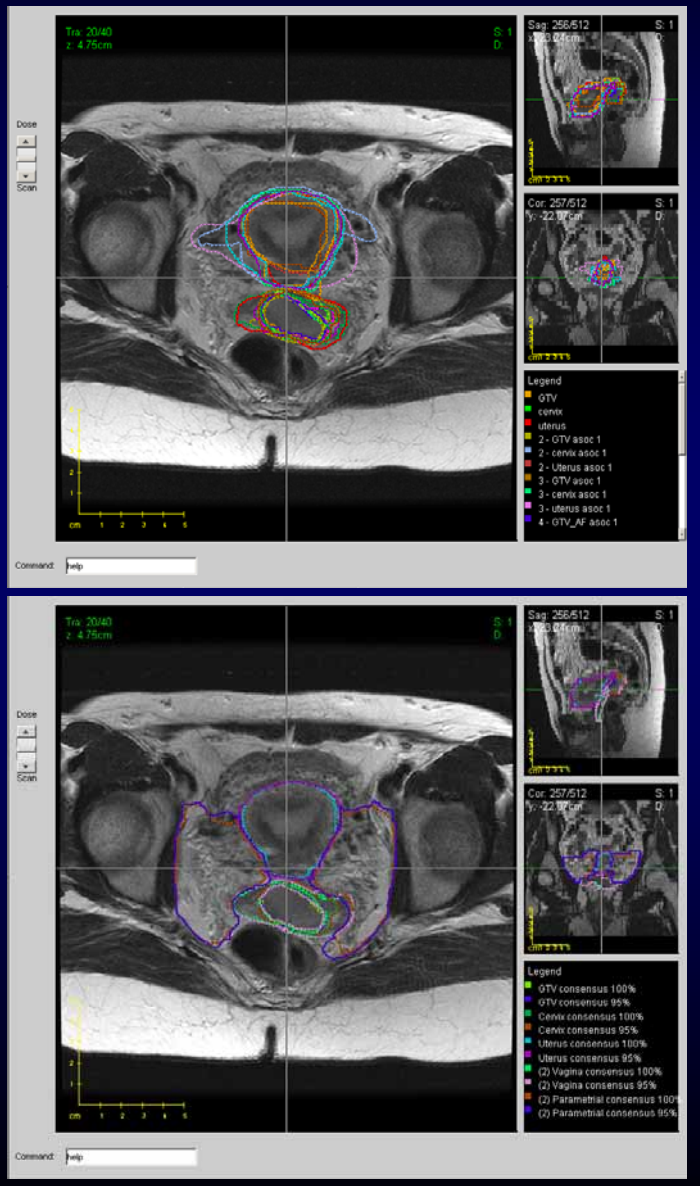
This document describes work in progress within the RTOG Advanced Technology Integration Committee (ATIC) and the Advanced Technology QA Consortium (ATC) to develop consistent nomenclature for structures used in radiation oncology treatment planning and plan review in ATC-supported clinical trials. Interest in and use of this information outside this scope is encouraged, but should acknowledge NCI U10 Grant CA021661 (RTOG) and U24 Grant CA081647 (ATC), which have supported this work.

Background

Consistent naming of contoured structures used in radiotherapy treatment planning is essential to facilitate the comparison of dose-volume statistics across patients for quality assurance and outcomes analysis. Maintaining consistency in structure names is particularly important (and challenging) in multi-institutional clinical trials, in which treatment planning data are collected from many participating institutions. Differences in treatment planning techniques and local languages are among the factors that contribute to variations in the names used to identify structures.

ATC Support for RTOG Consensus Contouring/ Image Segmentation Atlases

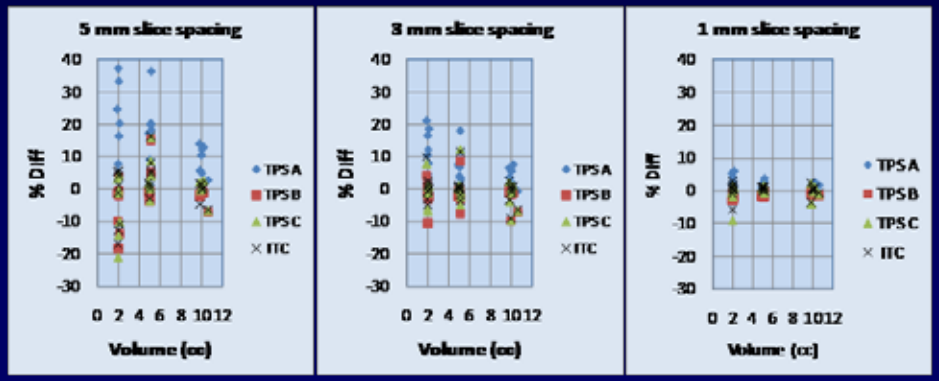
- Pelvic Lymph Node Volumes for Prostate Cancer
- Post-op Prostate Contours Atlas
- Anorectal Atlas
- GYN Atlas for CTV Delineation in Post-op Cervical and Endometrial Cancer
  - 19 participants
- Normal Tissue Pelvic Atlas
  - ~20 GU, GI, GYN participants
- Sarcoma Atlas
  - ~10 participants, 2 datasets
- Pancreas Consensus / Atlas (RTOG 0848)
  - ~6 participants, 4 datasets

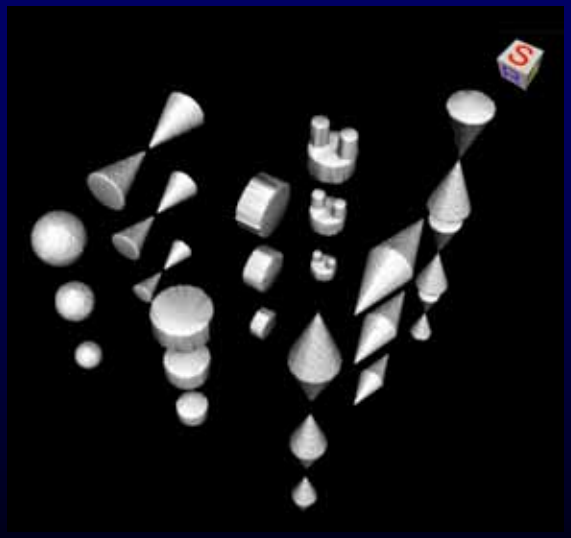


Investigation of DVH statistics calculated by commercial TPS

- POSDA open-source DICOM toolkit was used to render an electronic phantom with 24 objects on CT images series with 1, 2, 3, and 5mm slice spacing.
- Volumes of 2, 5, and 10cc objects were computed and compared:
  - three commercial TPS
  - ITC DVH tool
  - reference volume (computed from areas and thicknesses of polygonal prisms defined by contours)

% Difference between calculated volumes and reference volume vs. reference volume





ITC Support of TP Vendor Data Export Development and Testing – 2009

- ATC Compliant TPS
  - Nucletron Oncentra HDR – 6/24/09
  - BrainLAB iPLAN – 7/23/09
- Vendor Complete TPS
  - Elekta GammaPlan 9.0 (pre-release) – 9/17/09
  - PlanUNC V6.8.11 – 5/27/09
- Work in progress
  - Nucletron Ultrasound for Prostate Pre-plan

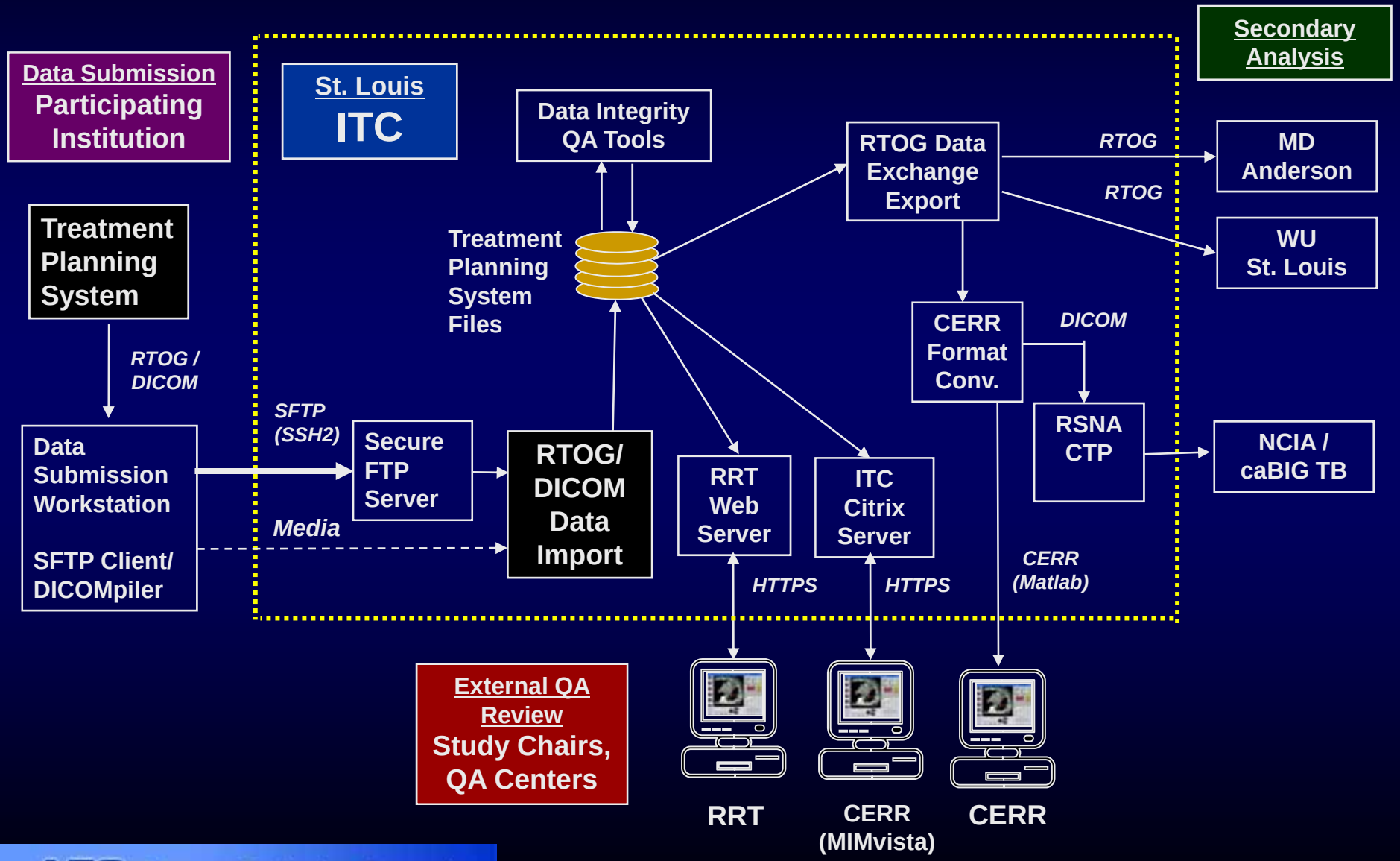
Treatment Planning Systems			Exchange Format	Treatment Modality				
Vendor	System	Version[1]		3DCRT	IMRT	Seed Brachy	HDR Brachy	Protons
Accuray	MultiPlan	1.5.2	D		✓			
BrainLAB	iPlan	4.1[2]	D	✓	✓			
Elekta	CMS Focus/XiO	3.1	R	✓	✓	✓		✓
	CMS XiO	4.3.1	D	✓	✓			
	RenderPlan 3D		R	✓				
	PrecisePlan	2.01	D	✓	✓			
Nomos	Corvus		R		✓[3]			
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 (Build 7.1.67)	D				✓	
	Eclipse	7.1	D	✓	✓			✓
	VariSeed	7.1	D			✓		

See http://atc.wustl.edu

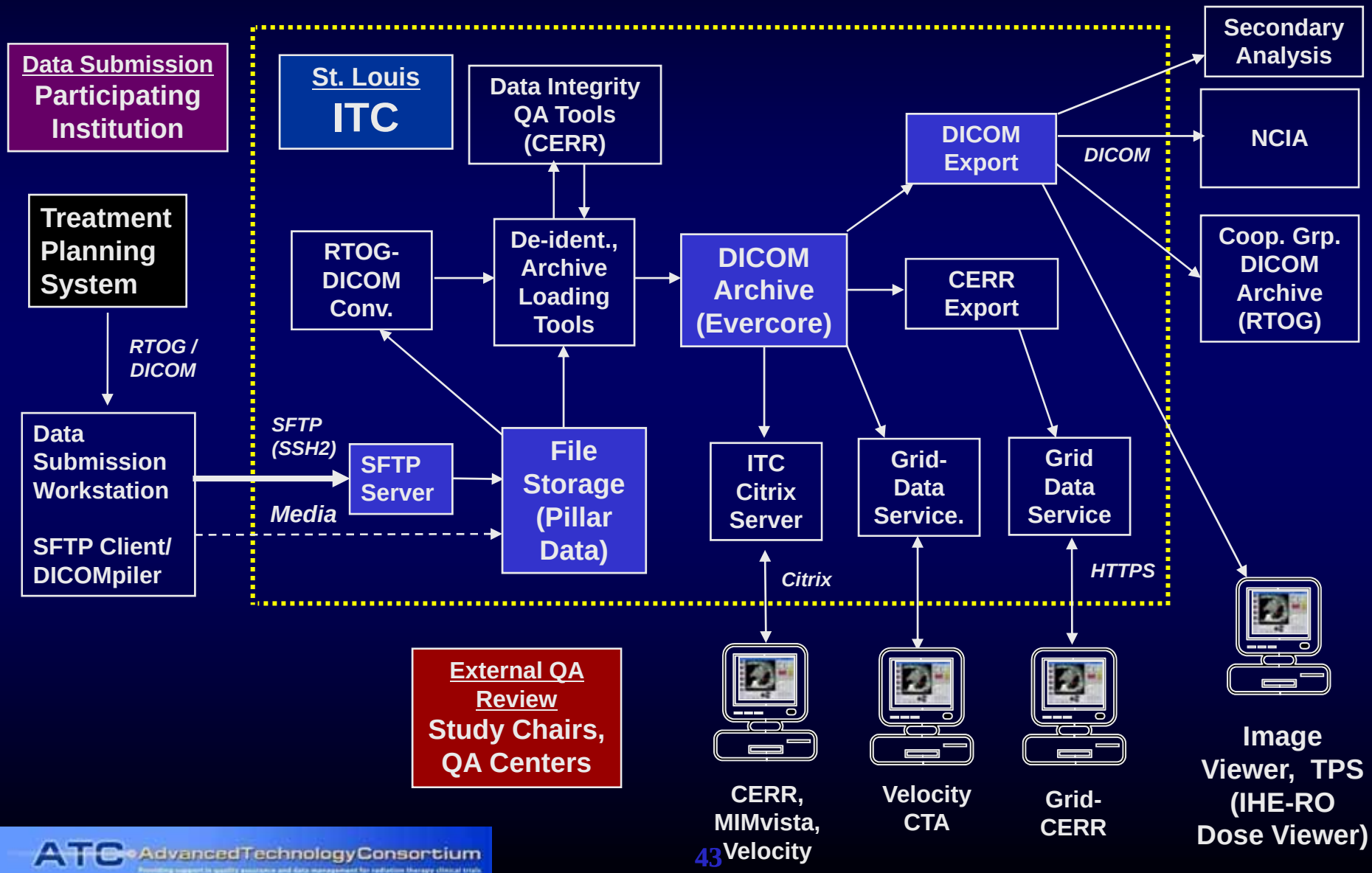
ATC Efforts in Support of RT Data Exchange Standards

- DICOM – Working Group 7
  - Maintenance of current DICOM RT information object definitions
  - Development of second-generation RT objects
- IHE-RO
  - Define profiles for interoperable use of existing standards (e.g., DICOM)
    - Advanced RT Integration Profile – 2009 Connectathon
    - Dose Compositing Profile
    - Anonymization for Clinical Trials
    - Structure Template Creation, Import, and Export

QuASA²R – *Current Components and Data Flow*



QuASA²R – *Development Plan*



ATC Administrative Supplement Aims

- **Develop and deploy ca-Grid infrastructure** to support distributed review/analysis and sharing of data among cooperative-group QA centers (Emory)
- Develop **data-integrity QA tools for more efficient evaluation and management** of submitted images and treatment planning data (ITC, WU/BIOR)
- **Develop protocol-compliance QA review tools** for diagnostic images, RT treatment planning data, and verification datasets (Emory, WU/BIOR)

ITC Plans for GY11

1. Service
   a. Continue to provide Digital Data Integrity QA (DDIQA) service to RTOG, NSABP, JCOG, EORTC, and other cooperative groups that request ITC services
   b. Continue to support NBIA/RTOG 0522/ACRIN Project
   c. Continue to support QRRO Prostate Seed Implant Project
   d. Continue to assist CDRP institutions to meet credentialing criteria for advanced technology protocols
   e. Explore new service opportunities

ITC Plans for GY11 (2)

2. Development (See timetable for QuASA^{2}R)
   a. Develop DDIQA / Archive loading tools for DICOM datasets to enable production use of the TeraMedica Evercore archive
   b. Implement DICOM-based RT plan and diagnostic image review tools (MIMvista, Velocity, CERR)
   c. Configure ITC Citrix remote access server for production use with CERR, MIMvista, Velocity
   d. Implement production mode caGrid infrastructure, Grid-enabled review tools (Grid-CERR, Velocity CTS), and data distribution systems (Virtual PACS).

ITC Plans for GY11 (3)

3. Coordination/Standards
   a. Promote simplified, coordinated credentialing process across QA Centers and cooperative groups serviced by ATC
   b. Promote uniform structure naming in advanced technology protocols
   c. Support RTOG Consensus Image Segmentation Atlases
   d. Continue efforts in support of RT Data Exchange Standards (DICOM Working Group – 7; IHE-RO; and Direct Support for TP Vendor Data Export Efforts)
   e. Continue to participate in caBIG In Vivo Imaging Workspace (Clinical Trials Enterprise Use Case)
   f. Continue to monitor related informatics efforts: (1) MAX – QARC; (2) TRIAD – ACR; (3) VIEW – QARC, ACR; (4) OPEN – CTSU; (5) CDMS – caBIG; (6) Docu-MART – CTEP, CALGB, ECOG, SWOG
   g. Update/maintain ATC website

Response to 2008
ATC Steering Committee Comments

2008 ATC Steering Committee General Recommendations

- Efficient ACR/ACRIN collaboration
  - Ibbott member of ACRIN QC committee
- Support industry initiated trials of novel agents with RT
- Expand infrastructure to support single institution or non-RT trials
  - Mission of ATC is to support cooperative groups

2008 ATC Steering Committee Informatics Recommendations

- Encourage industry implementation of DICOM
  - Most systems have DICOM
  - Anonymization tools important
- Encourage use of commercial TPS for remote review
  - ITC—CMS focal, MimVista, Velocity AI
  - RPC—Varian eclipse
  - RTOG—MimVista, IMPAC, Aria, Eclipse
- Harness CaBIG/CaGRID efforts for QA/QI
  - Working with CaBIG in vivo Imaging Workspace
- Maintain cooperation between ATC, CaBIG, VIEW, ACRIN
  - Working with CaBIG in vivo Imaging Workspace
  - QARC working with VIEW
  - RTOG/ACRIN
  - RPC/ACRIN—Ibbott

2008 ATC Steering Committee Credentialing QA Recommendations

- Adopt/Modify IGRT phantom for credentialing
  - RTOG, RPC, QARC progress
- Reassess credentialing process
  - ATC credentialing/QA committee
  - Data driven
  - International harmonization
- Pilot new credentialing programs
  - Existing programs developed in this manner
  - AAPM opportunity
- Implement advanced heterogeneity algorithms
- Support smaller centers
  - CDRP efforts
  - RPC efforts

2008 ATC Steering Committee
Data Sharing/Mining Recommendations

- Develop database inventory
  - All groups committed to develop inventories
- Develop process to access QA data
  - Request form exists—work with cooperative groups
- Develop mechanism to propose projects
- Develop means to allow data mining

2008 ATC Steering Committee
Data Sharing/Mining Recommendations

- Encourage RPC QA data to be readily accessible
  - Institutional confidentiality requires careful control
- Encourage ATC QA groups to enhance outcomes initiatives by investigators
  - Secondary analysis request described above
- Encourage RPC data mining
  - Informatics infrastructure allows this
- Demonstrate utility of data sharing
  - Deasy and Tucker R01 applications
- Monitor security of patient data
- Ensure safeguards for remote access of patient data

2008 ATC-SC Concerns/Questions

- Expansion of imaging lab services at RTOG
- Lack of radiology engagement in RT protocols
- Lack of cooperation between RTOG/ATC in infrastructure development and contract implementation
- ITC, QARC, RTOG, RPC, and ACRIN collaborations are not seamless
- ATC Council of Industry Participants role
- Leadership transition

2008 ATC-SC Concerns/Questions

- Lack of progress in development of review tools and data sharing
  - RTOG Data Exchange>>DICOM-RT
  - RRT>>CERR and MiMVista
  - QuASA^{2}R to migrate from CMS database to DICOM (Evercore)
- Lack of effort to integrate CaBIG and ATC
  - ATC participates in CaBIG in vivo imaging workspace along with J. Deasy (WU), J. Saltz (Emory), and T.J. Fitzgerald (QARC) to integrate QARC-MAX and ITC-QuASA^{2}R into CaBIG Grid infrastructure

2008 ATC-SC Concerns/Questions

- Universal Credentialing
- Standardizing protocol guidelines
- International sites
- DDIQA requires 27% human intervention
- High failure rate for RPC phantoms
- Data sharing/mining

ATC Evaluation Committee Meeting
Michael Vannier, Ted Lawrence, David Cluny

- January 15, 2009
- New Orleans, LA

Comments

- Significant role in RT clinical trials
  - Med Physics, Informatics, clinical trial expertise
- Many trials in development could not be done without ATC
- Quality and rigor in trial design important
- Infrastructure captures data for re-use
  - ATC should advocate for free access to data after initial goals of study are accomplished.
- ATC-EC helps broad view of ATC in context of national and international trials

Comments (2)

- Inter-institutional environment is fragmented and complex
- ATC should take steps to help outsiders understand how components fit together and interact
- Website does not sufficiently inform external groups
- Need for ATC to be aware and introduce state of the art imaging and response assessment into trials.
  - IRAT, QIBA, UPICT, CTSAs, etc
- Formal mechanism to set priorities might improve ATC productivity

Software Engineering Practice

Capability Maturity Model – Integrated

Level	Focus	Process Areas	Result
5 Optimizing	*Continuous process improvement*	Organizational Innovation & Deployment Causal Analysis and Resolution	Productivity & Quality
4 Quantitatively Managed	*Quantitative management*	Organizational Process Performance Quantitative Project Management	
3 Defined	*Process standardization*	Requirements Development Technical Solution Product Integration Verification Validation Organizational Process Focus Organizational Process Definition Organizational Training Integrated Project Management Risk Management Decision Analysis and Resolution	
2 Managed	*Basic project management*	Requirements Management Project Planning Project Monitoring & Control Supplier Agreement Management Measurement and Analysis Process & Product Quality Assurance Configuration Management	
1 Initial	*Competent people and heroics*		

Questions
Discussion