ATC Meeting February 1, 2007

Jeff Michalski

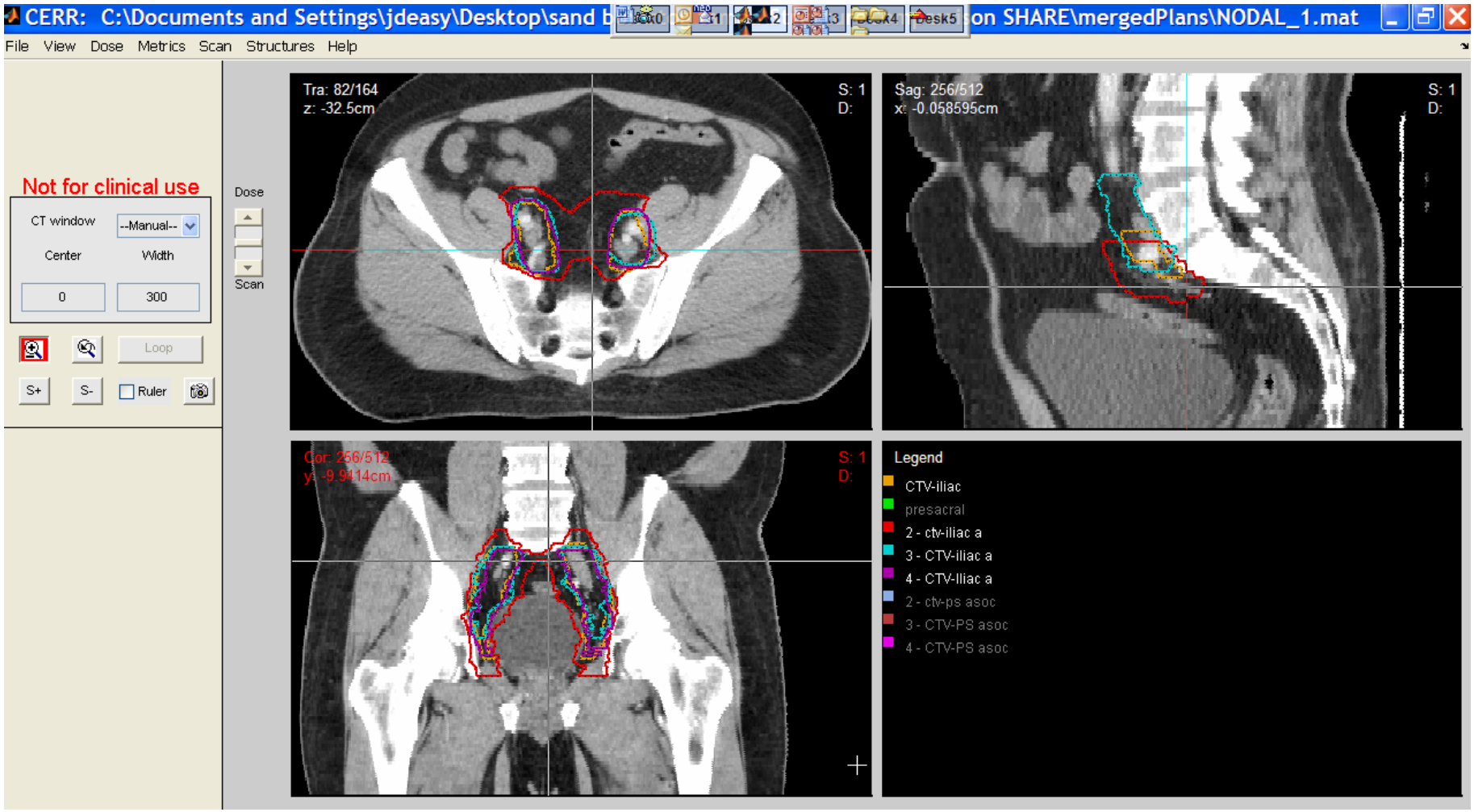
Prostate Contouring Atlas

Prostate contouring atlas

- Nodal Scenarios
  - Case 1: A 60-year-old gentleman with a clinical T3b, Gleason Score 7, (4+3) PSA 40 adenocarcinoma of the prostate. **[Kattan nomogram ≥ 32% risk**]
  - Case 2: A 60-year-old gentleman with a clinical T1c, Gleason Score 9 (4+5) PSA 9 adenocarcinoma of the prostate. [**Kattan nomogram = 8% risk**]

- Post-Operative Scenarios
  - Case 3: A 59-year-old gentleman with a preop clinical T1c, Gleason 7 (3+4) PSA 12 adenocarcinoma of the prostate. He is status post radical retro pubic prostatectomy and found to have pathologic T2c, Gleason Score 7 (3+4) disease. Pathology reveals **margins positive bilaterally at the apex**. His PSA went to **undetectable for 2 years then rose to 0.2 and 6 months later was 0.3** ng/ml. Please draw the CTV-TB for this case.
  - Case 4: A 68-year-old gentleman with a preop clinical T2a, Gleason 8 (4+4) PSA 15 adenocarcinoma of the prostate. He is status post radical retro pubic prostatectomy and found to have pathologic T3b, Gleason Score 7 (4+4) disease. Pathology reveals **extracapsular extension at the right base and right seminal vesicle invasion**. **Surgical margins are negative**. His PSA is undetectable and he is referred to you 90 days postop. He has recovered urinary continence but is now impotent. Please draw the CTV-TB for this case.

Platform for comparing target definitions: Michalski et al. comparison of prostate target volumes



Problems and Opportunities

- Data exchange from some RTP systems
- Instructions
  - Did some submit PTVs?
- Need for consensus conference
- Analysis of variation
- Development of CTV consensus for current protocols
- Other disease sites
  - Breast
  - Gyn
  - GI (anal canal example)
  - H&N (complete)
  - Lung
  - Brain

Adaptive Radiation Therapy Trials

Requirements-ATC
Developmental Needs

RTOG TRIAL CONCEPT:
4D Imaging for Prostate IGRT: Analysis of Localization Techniques and TCP/NTCP Modeling

Larry Kestin, M.D.
Department of Radiation Oncology
William Beaumont Hospital

RTOG Trial Concept

Eligibility

- Registry study – companion study for RTOG 0415
  - "Daily target localization (fiducial markers, transabdominal ultrasound or other) is required for this protocol."
- Patient must be enrolled in and meet the eligibility requirements for RTOG 0415
  - clinical stage T1-T2c
  - pretreatment PSA < 10 ng/mL
  - Gleason score $\leq$ 6

RTOG Trial Concept
Primary Objectives

- To collect daily localization imaging data obtained via various modalities through the ATC for daily actual dose calculation and accurate modeling of TCP and NTCP of critical structures (i.e. rectum, bladder, penile bulb, femoral heads)
  - CT scans (Volumetric information)
    - kV helical
    - MV helical
    - kV cone-beam
    - MV cone-beam
  - x-ray images of fiducial markers
  - ultrasound images (BAT, I-Beam, etc)

RTOG Trial Concept
Secondary Objectives

- To assess the feasibility of submission and processing of localization imaging data
- To compare single vs. multiple images for modeling of TCP and NTCP
- To determine an optimal number of image sets required for accurate modeling within a given confidence interval
- To determine shifts actually employed for various localization techniques
- To determine the optimal margin for each localization technique for adequate dose delivery within a given confidence interval
- To quantify the dosimetric advantages of online vs. offline processes for each localization technique

Larry Kestin, M.D.

RTOG Trial Concept
Data Collection

- Daily localization imaging data
  - pre-correction
  - post-correction (if available)
- Daily shift data (shifts actually performed)