Ultrasound Guided Interstitial High Dose Rate Prostate implants (RTOG 0321 protocol)

Credentialing Process

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Acknowledgment: some of the slides were borrowed from

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Pre-Approval to participate in RTOG 0321

- Institution, Radiation Oncologist, and Physicist are credentialed as a team.
- Team Should show adequate knowledge of:
  - The Clinical protocol
    - RTOG knowledge form (http://rpc.mdanderson.org) requires that the prostate team must have performed at least 10 implants.
  - Treatment planning system (If institution has changed to a different TPS, then requires re-credentialing, two reference cases need to be submitted).
  - QA procedures
- Team should submit:
  - Questionnaire and Reference Cases through ITC (http://itc.wustl.edu) or directly to RPC (http://rpc.mdanderson.org)
  - Data for a recent HDR prostate implant performed by Radiation Oncologist & Physicist.

HDR PROSTATE IMPLANT

1. Trans Rectal US (TRUS) Cystoscopy guided catheter insertion
2. CT guided catheter adjustment
3. CT catheter localization and contouring
4. Computerized optimization
5. DVH
6. HDR Treatments

Spinal Anesthesia

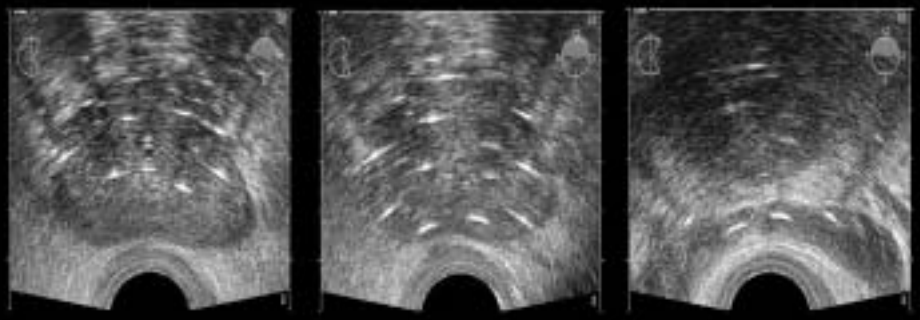
Generally epidural or spinal anesthesia is used for the implant procedure

TRUS set up

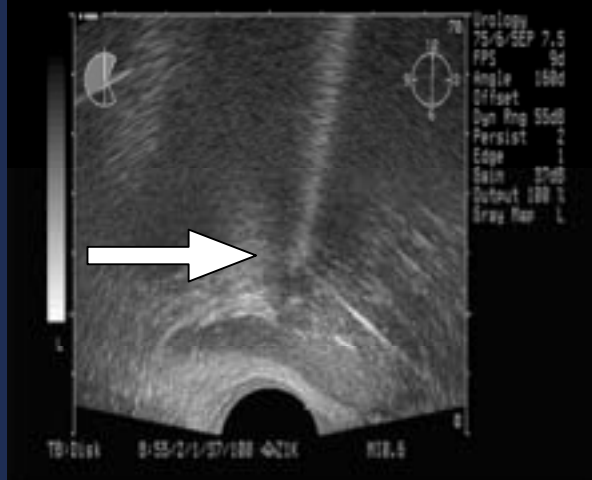
A stepper can be used to hold

the ultrasound probe during the implant procedure

Transverse TRUS images

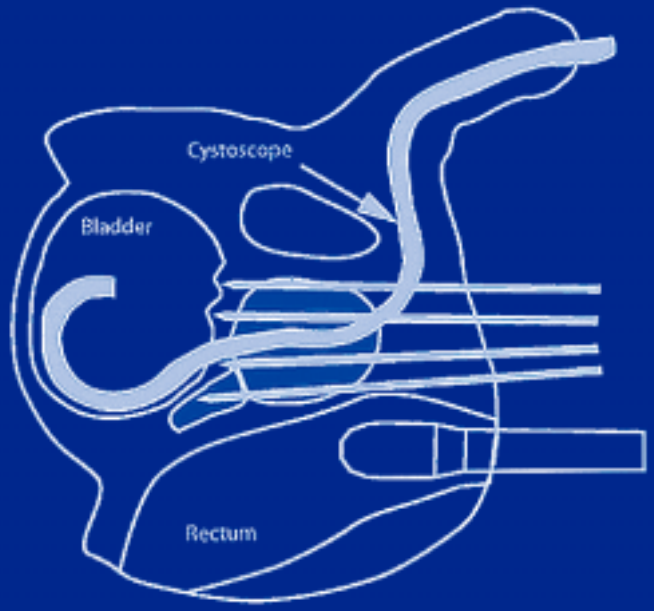


TRUS images



Gold marker placement at the prostate base

Gold marker placement at the prostate apex

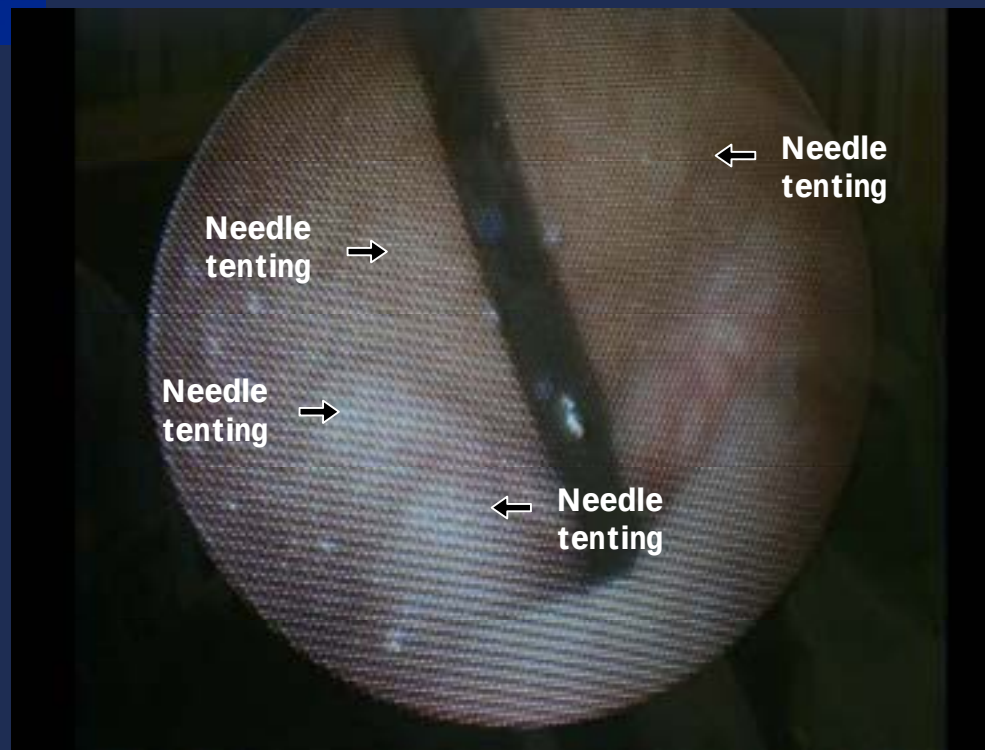


Flexible Cystoscopy

It is recommend to use cystoscopy to check the catheter depth and to remove any catheter in the bladder or urethra

Cystoscopy image

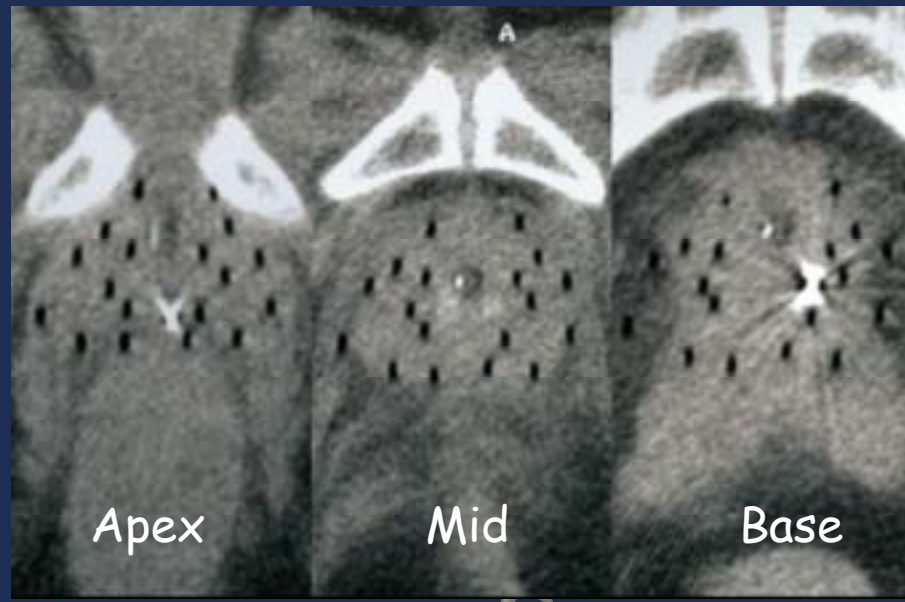
Needle tip should be tenting but not through the bladder mucosa



Finished implant

CT of the implant

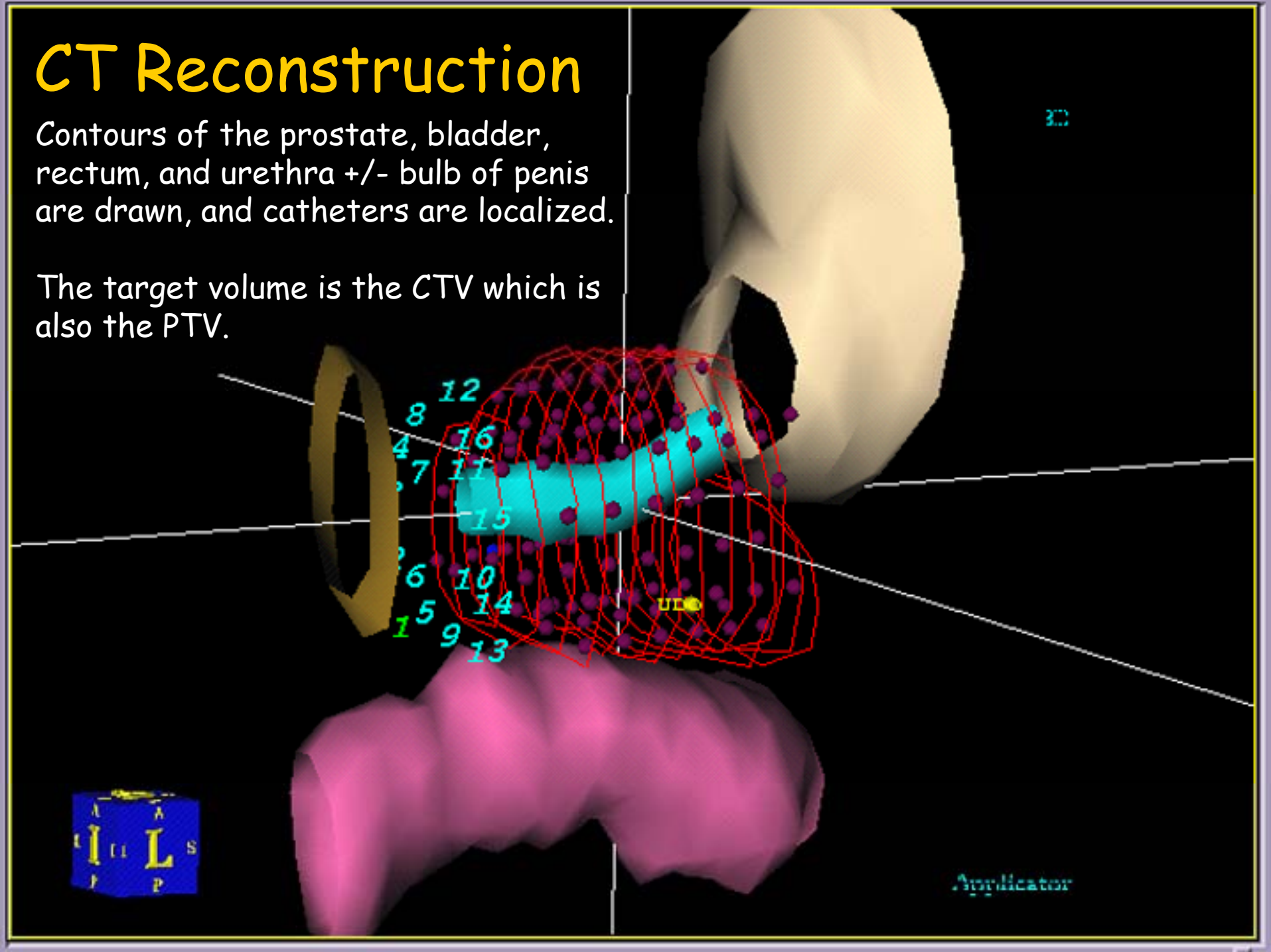
- The thickness of the CT scans should be at Least 3 mm.
- At a minimum, the scans should cover 3 slices above and 3 slices below the prostate.
- All the catheter tips must be shown on the scans.



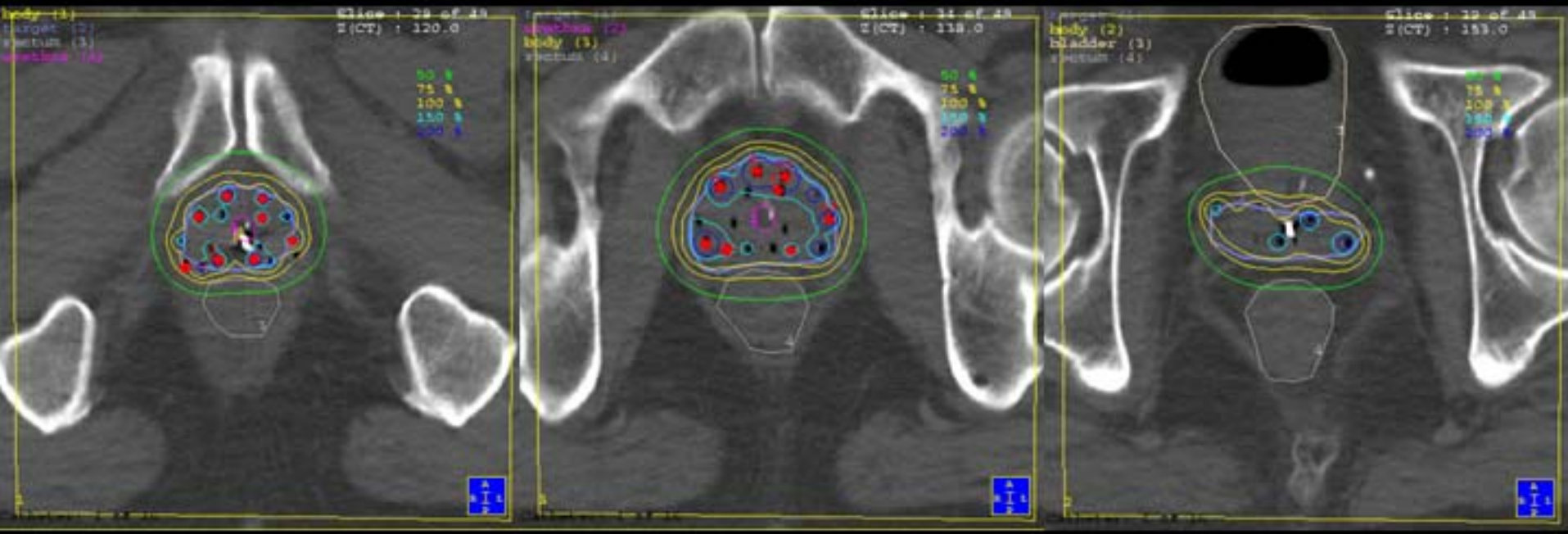
CT Reconstruction

Contours of the prostate, bladder, rectum, and urethra +/- bulb of penis are drawn, and catheters are localized.

The target volume is the CTV which is also the PTV.

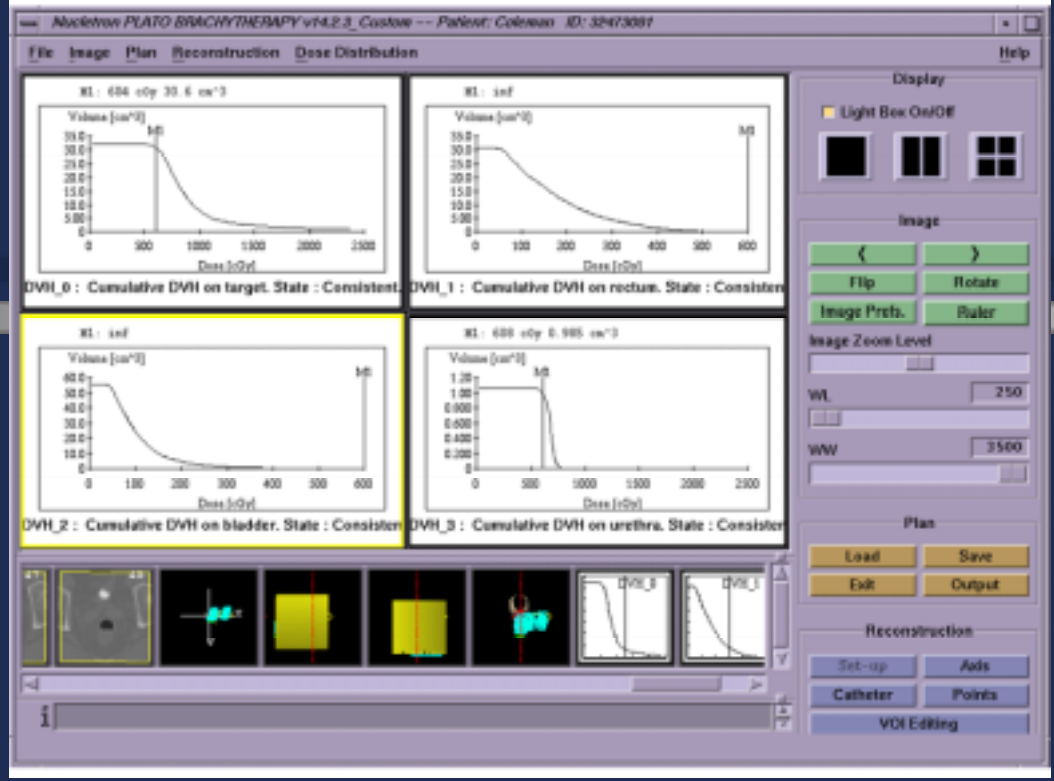


3D Treatment Planning



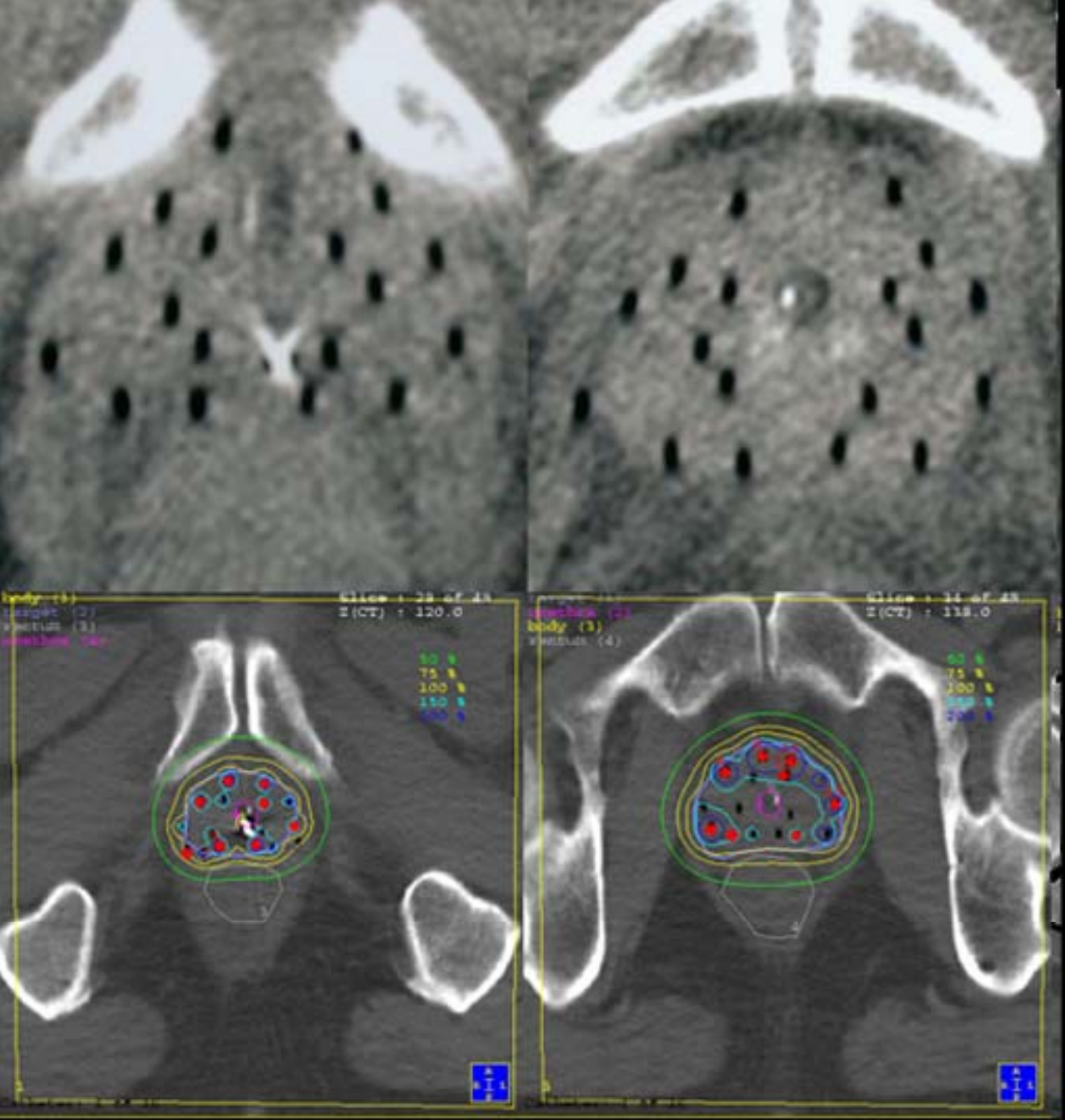
After selecting the active dwells, there are various method of dwell time optimization. Any method is okay as long as the rectal, bladder V100 < 1cc and urethra V150 = 0 cc.

DVH



QA of the prostate coverage by the implant is evaluated as follows:

% of PTV	Receives	Evaluation
≥ 90%	prescription dose	per protocol
≥ 80% to < 90%	prescription dose	minor variation
< 80%	prescription dose	major variation



DICOMRT

For QA

1. The original CT should be submitted in DICOM format

2. Entire treatment plan in DICOMRT format

Accreditation of Institutions

(Data Needed)

- **Treatment Planning System**
  - Dose matrix
  - Coordinates of dwell positions
  - Dwell times
  - Source Activity & Isotope
- **CT scans & Films**
  - Magnification factors
  - Slice thickness
- **Verification from HDR Unit**
  - Date of insertion
  - Dwell positions
  - Dwell times
  - Source Activity & Isotope