

A Verification of Dose Deformation and Treatment Planning Software

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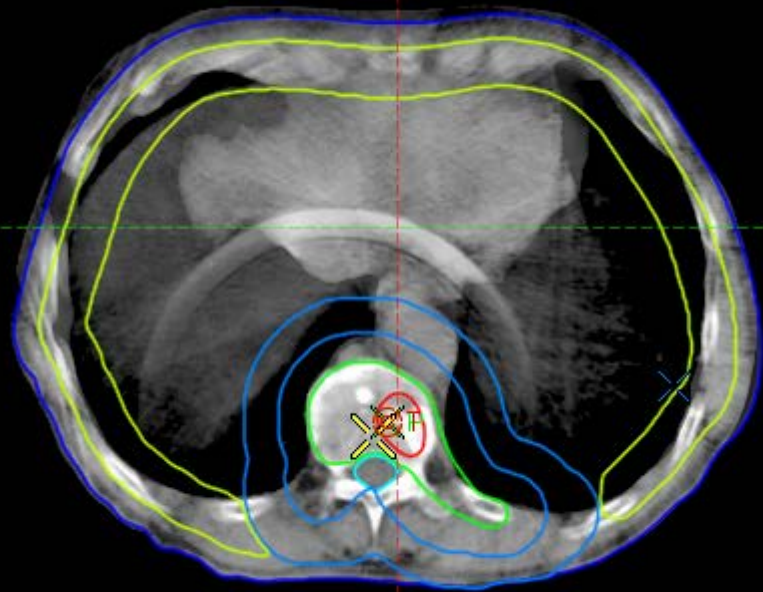
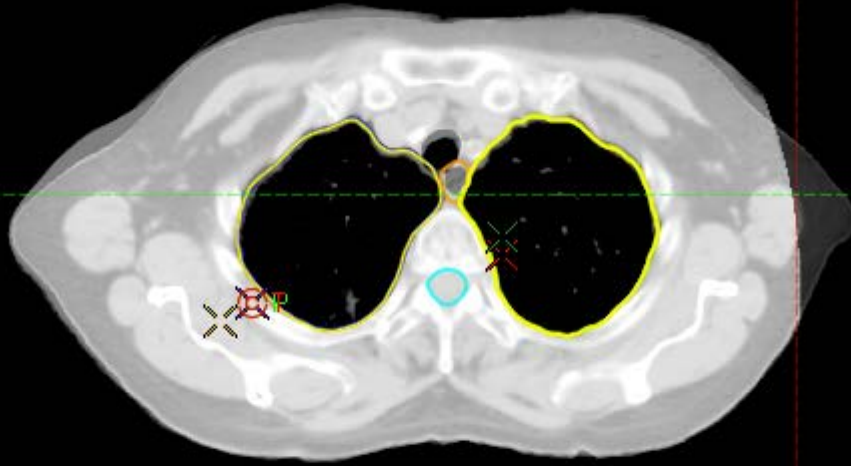
- Not a Treatment Planning System
- Fusion Software
 - 4D CTs, CBCTs, MRIs, PET scans, and Dose
- Used for transferring of contours from Plan CT to CBCT, and adjusting volumes to fit

Goals

- To see if MIM and Pinnacle agree in the dose to normal structures and targets
- Can be used for
 - Adaptive use
 - Verification
 - Dose Accumulation

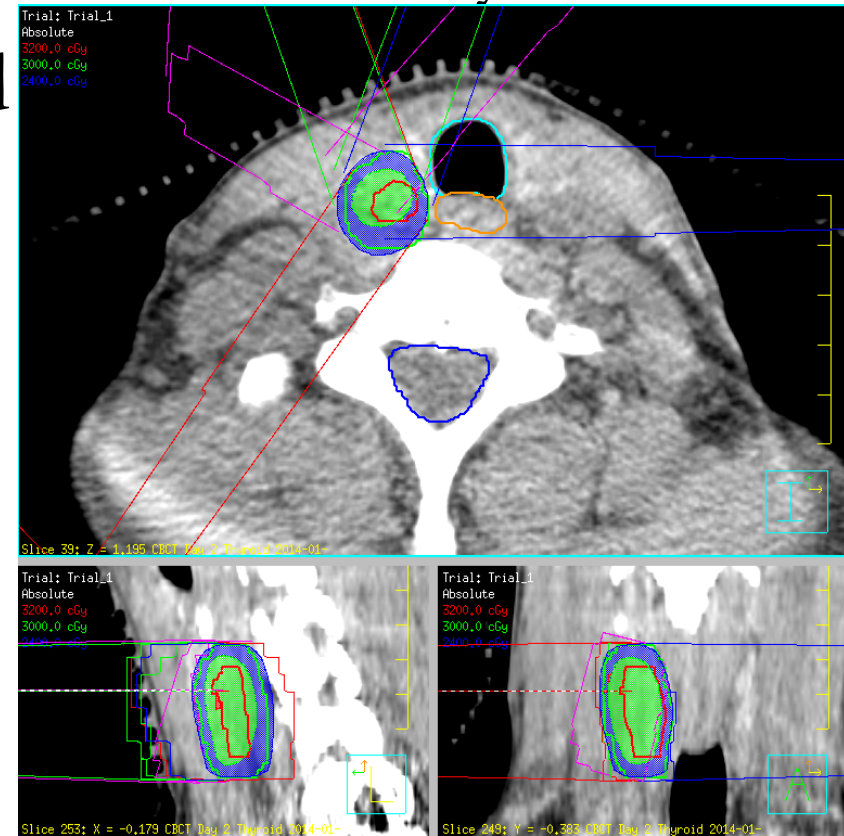
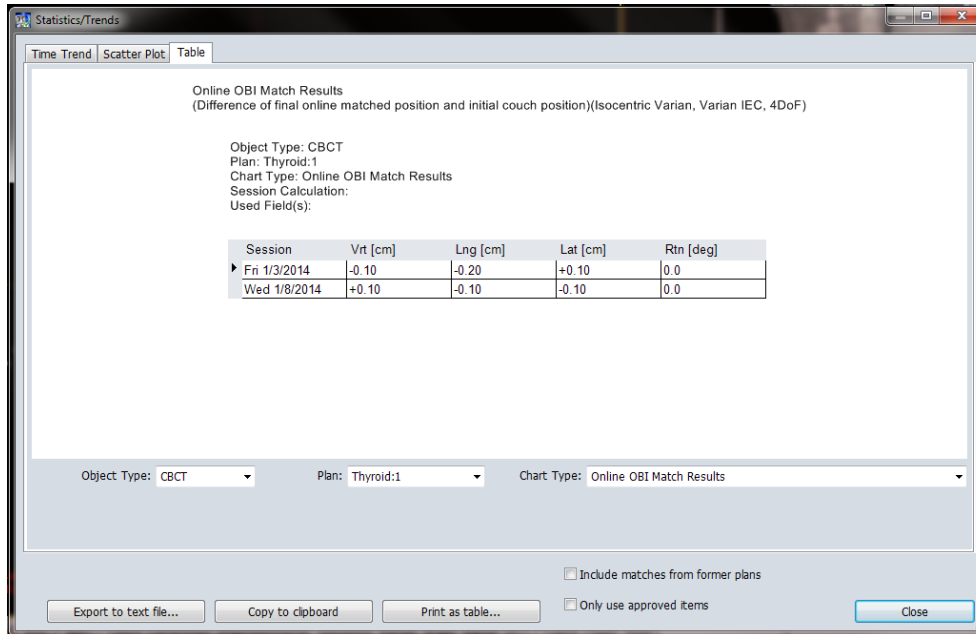
Patients Used

- High Dose SRS/SBRT
- High quality images
- Ones with CBCTs that were not cut off or clipped radially
- No large artifacts



Calculating Dose on CBCT

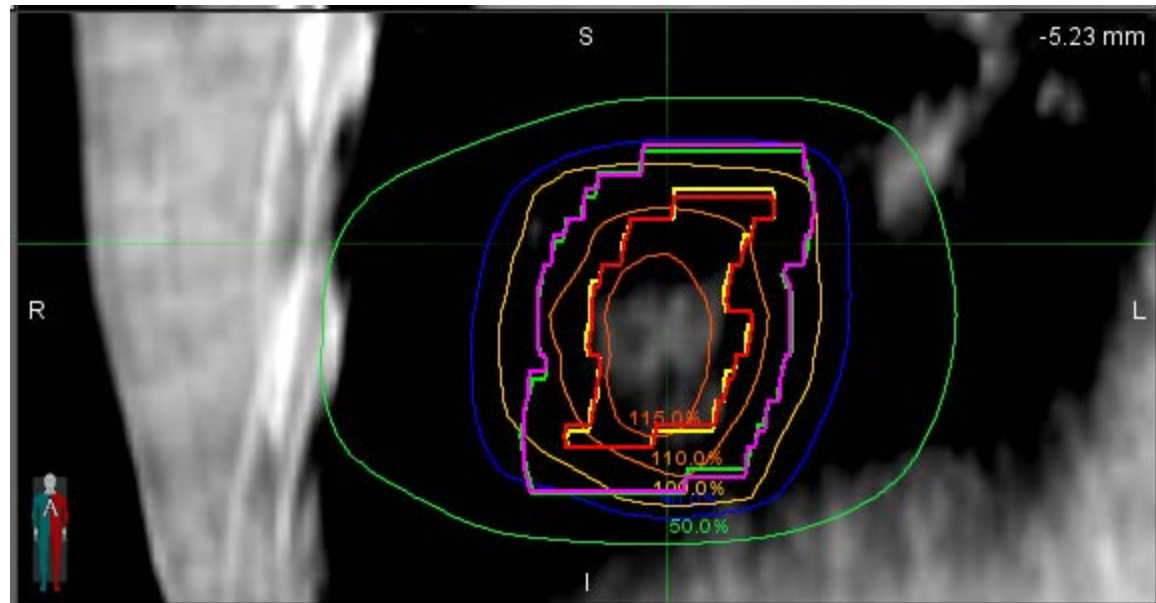
- CBCT brought into Pinnacle
- Beams from plan dropped onto the CBCT
- Isocenter treated at was used for that day
- Used as our gold standard



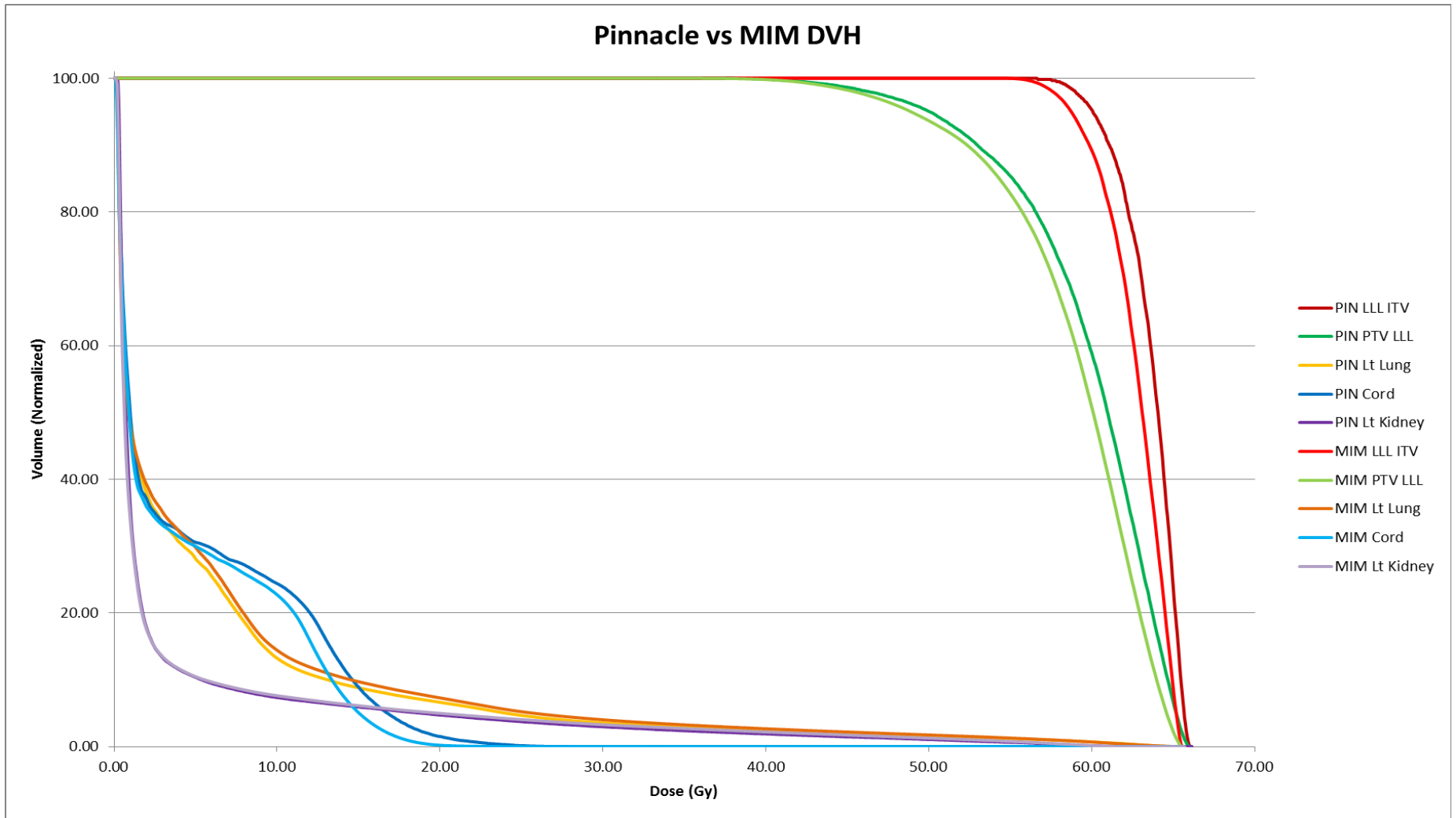
Possible Complications

- Transferring of contours
- Differing of Slice Thickness
- Volume Differences

- Solutions?

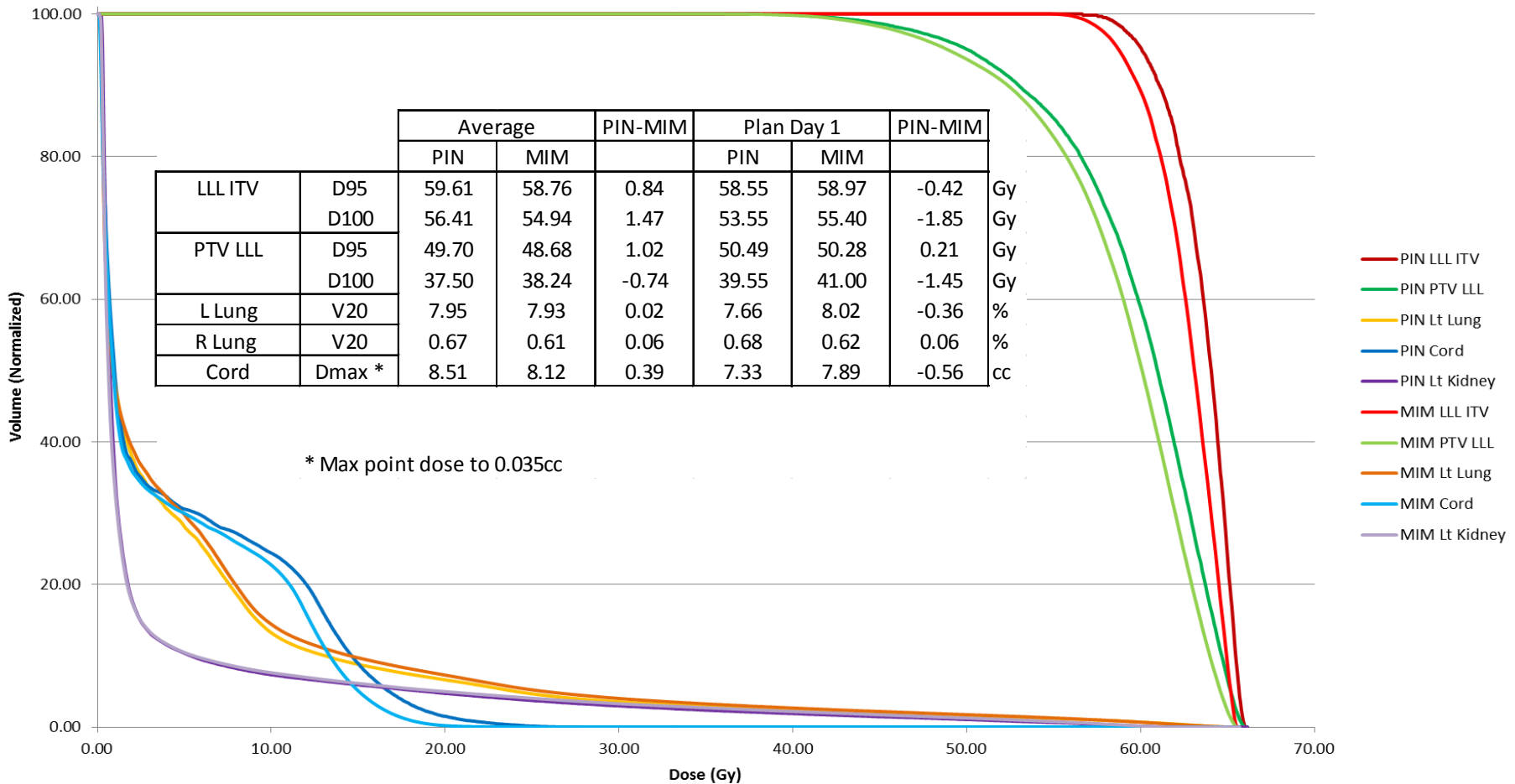


Lung Lesion 1

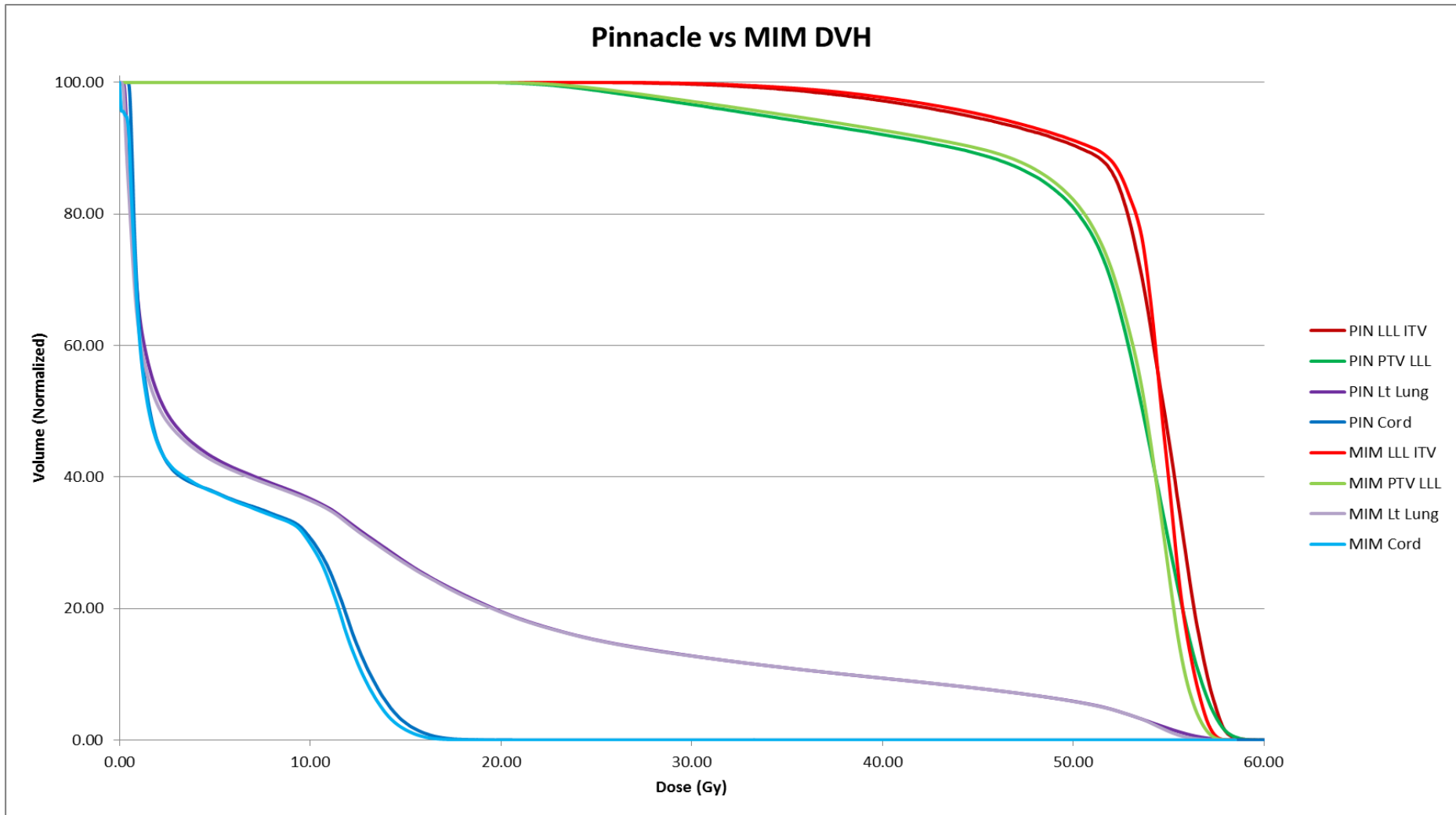


Lung Lesion 1

Pinnacle vs MIM DVH

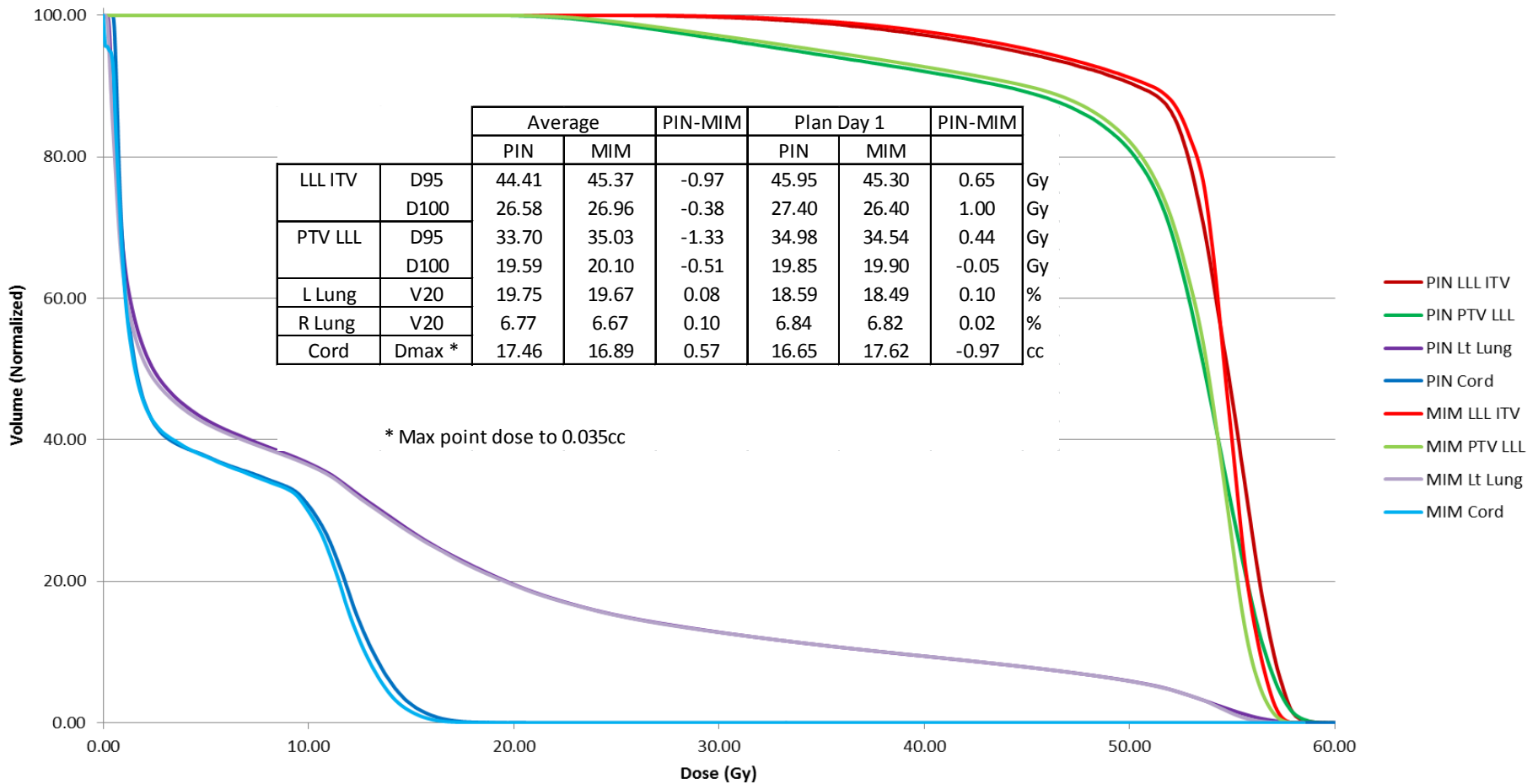


Lung Lesion 2

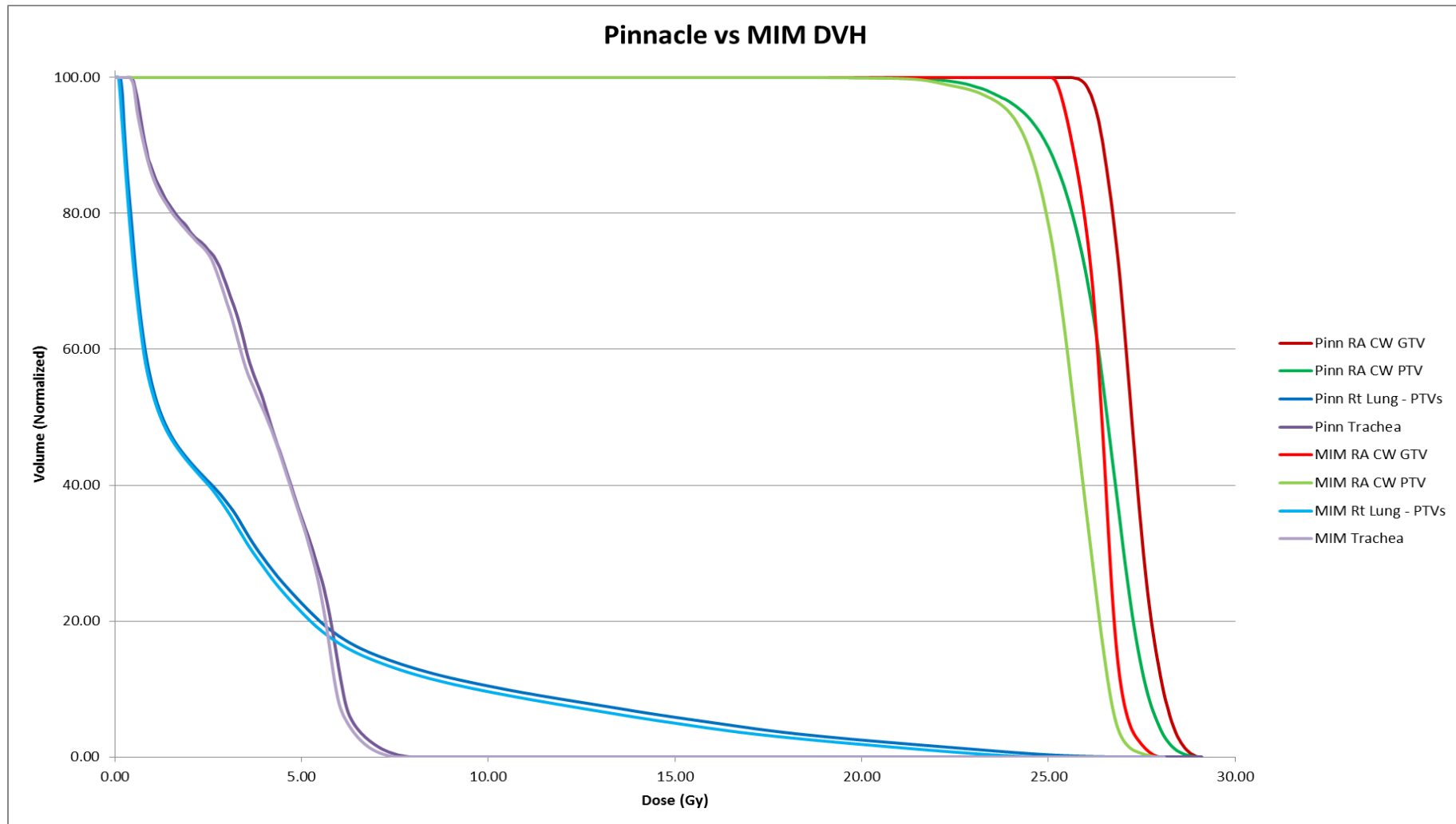


Lung Lesion 2

Pinnacle vs MIM DVH

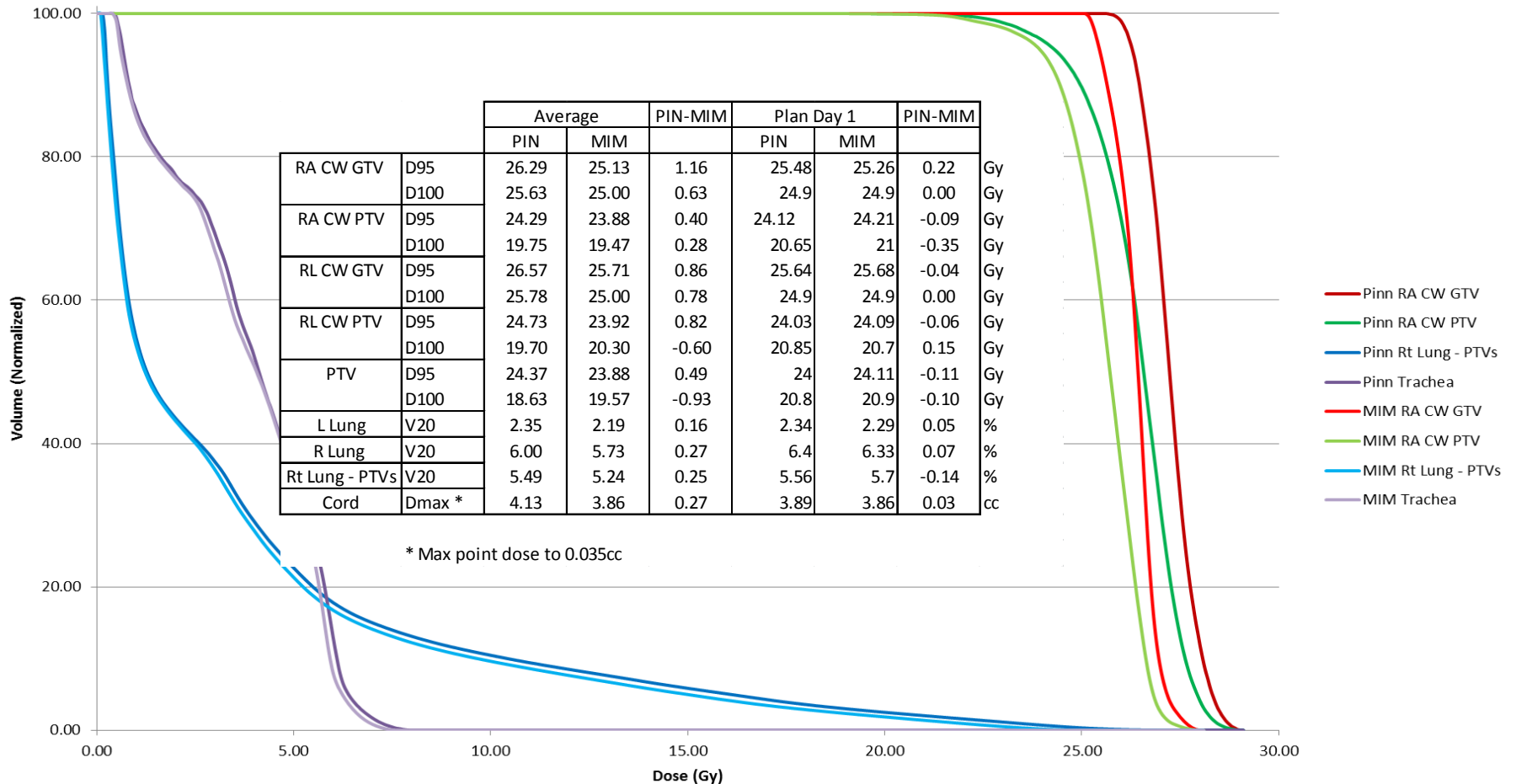


Chest Wall Lesion

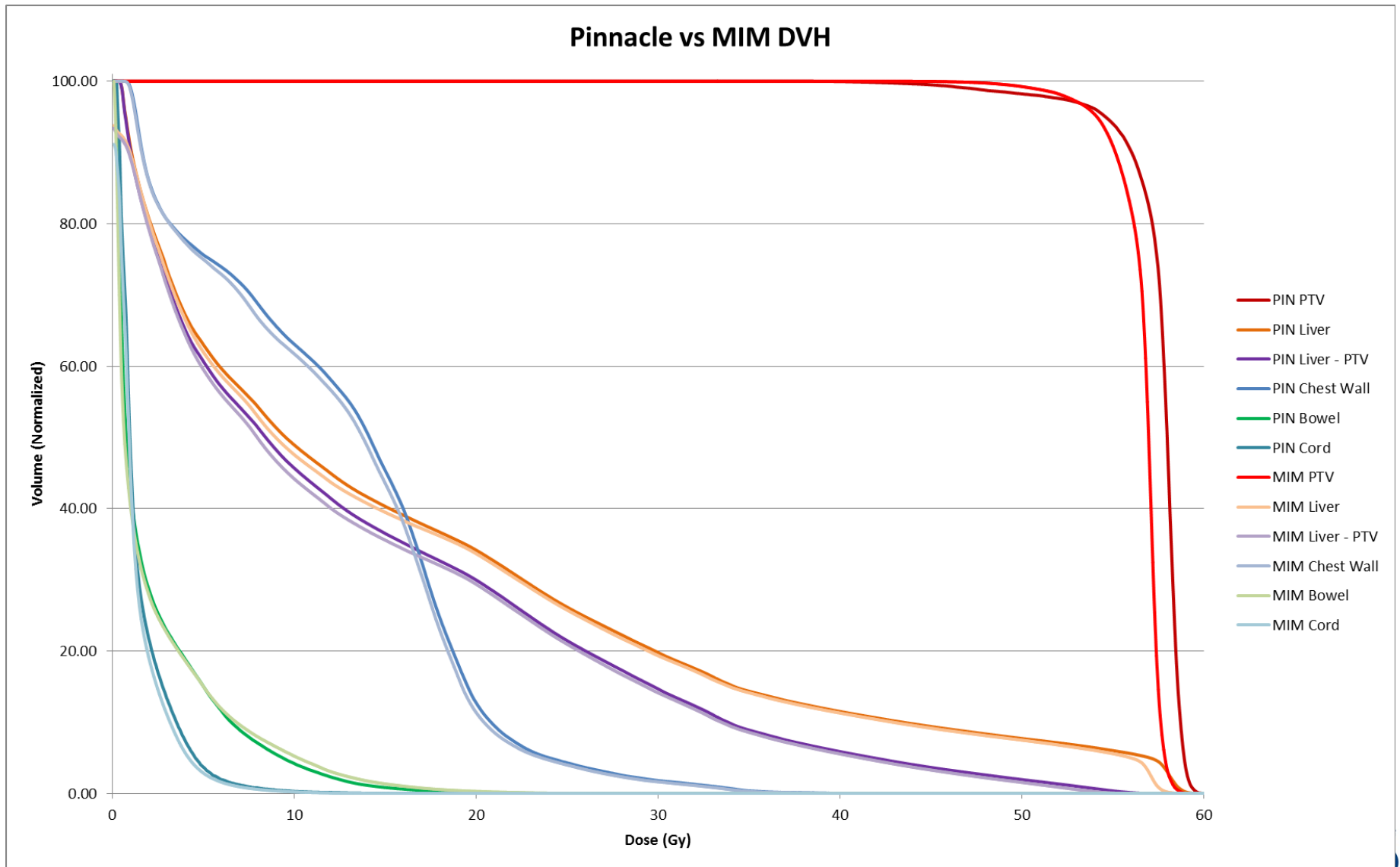


Chest Wall Lesion

Pinnacle vs MIM DVH

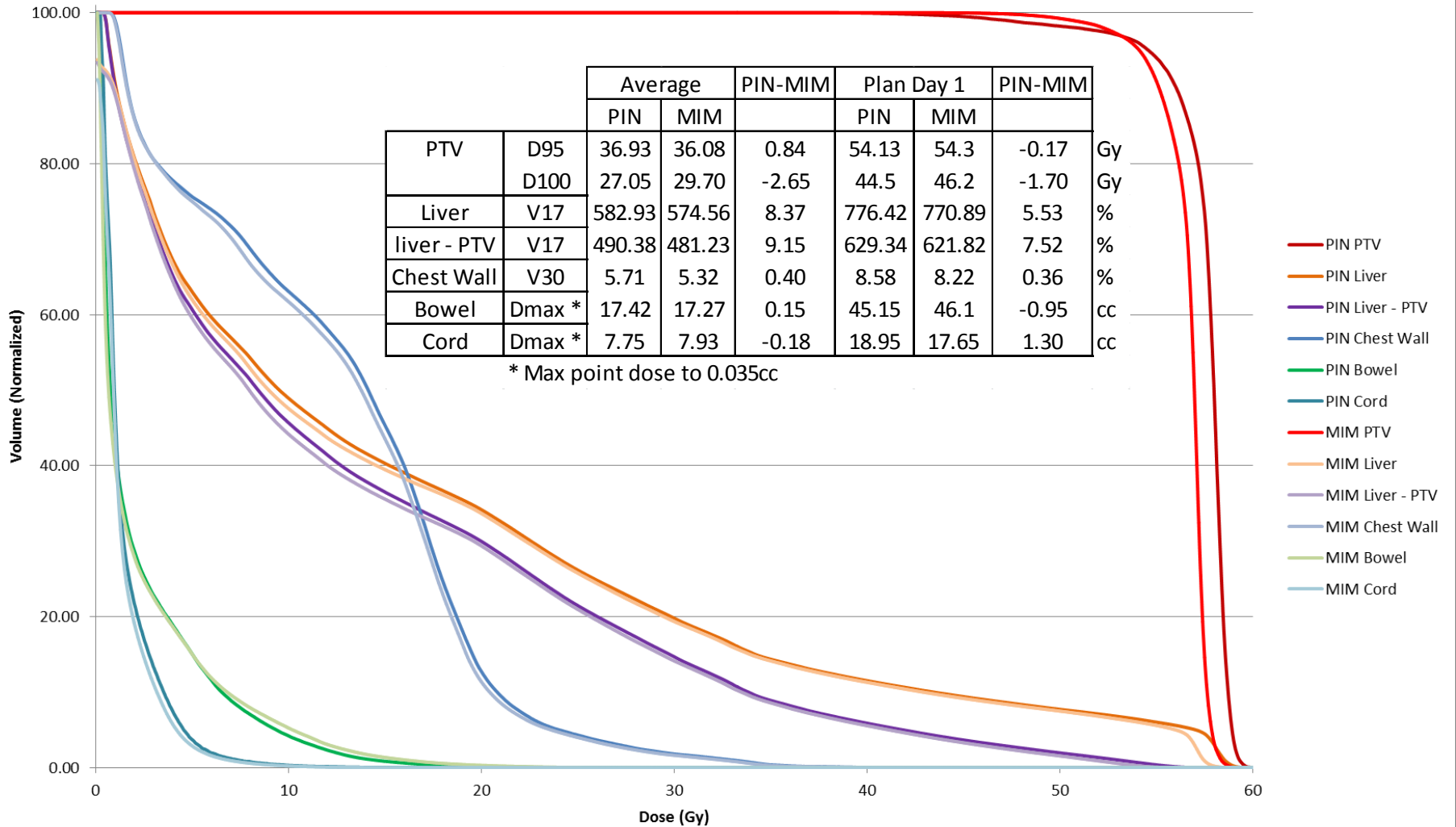


Liver Lesion



Liver Lesion

Pinnacle vs MIM DVH



Conclusions

- I have found that the dose to normal structures is similar, within 1-2% however the target coverage is not that great.
- I have found that the dose to 95% of the target can differ up to 5Gy in some cases equivalent to 10% of the prescribed dose.
- MIM and Pinnacle calculate their DVHs differently

Conclusions

- MIM can be used as a quick estimate of dose to the patient to see if the structures are receiving a large difference in intended dose but not to accurately determine if there is proper target coverage.
- This inaccuracy in the target may be due to their size in some cases and the difference in volumes between MIM and pinnacle.

Thank You

