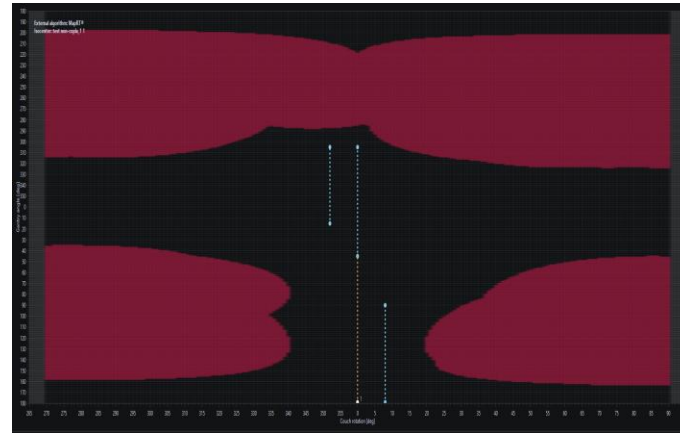
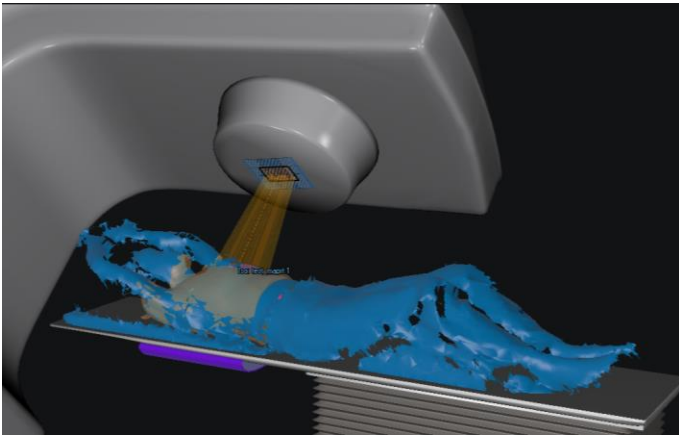


The use of MapRT with full RayStation integration

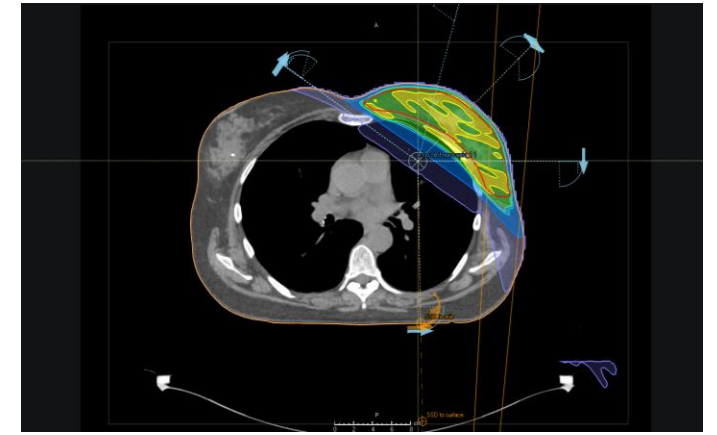
Clinical use

Jonas Graniero Thue



RayStation integration

Johannes Kjeldsen Bergvoll



Radiumhospitalet - OUH

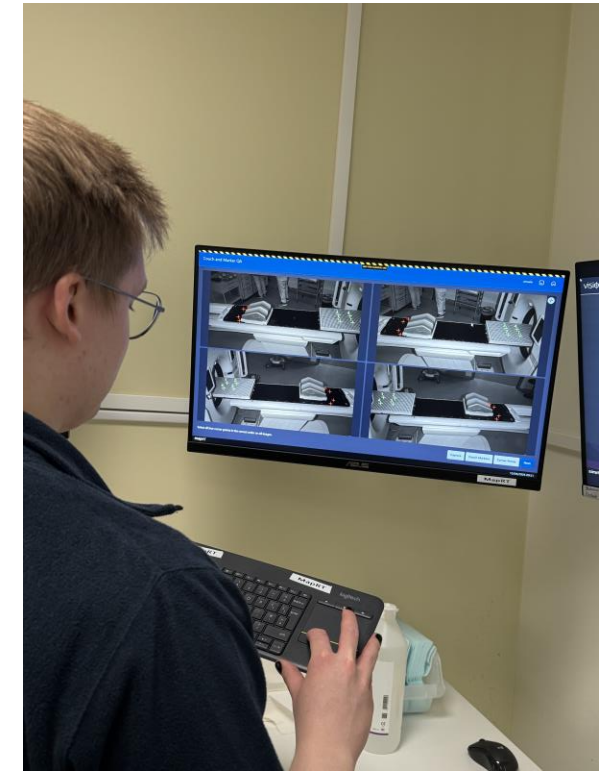
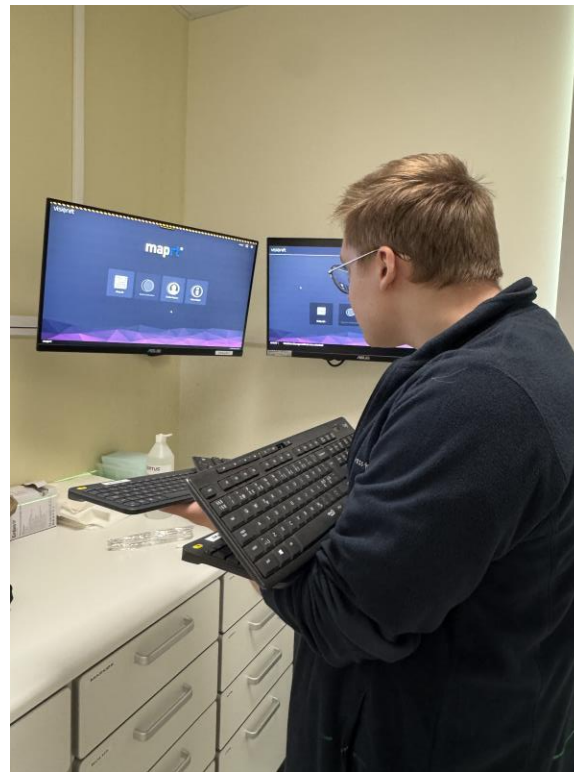
- 16 linac – 16 AlignRT
- 2 Brachy
- 2 RadMRI
- Protontherapy – 2 AlignRT
- 3 RadCT – 1 MapRT – 1 SimRT



CT-room



Implementation phase and employee training



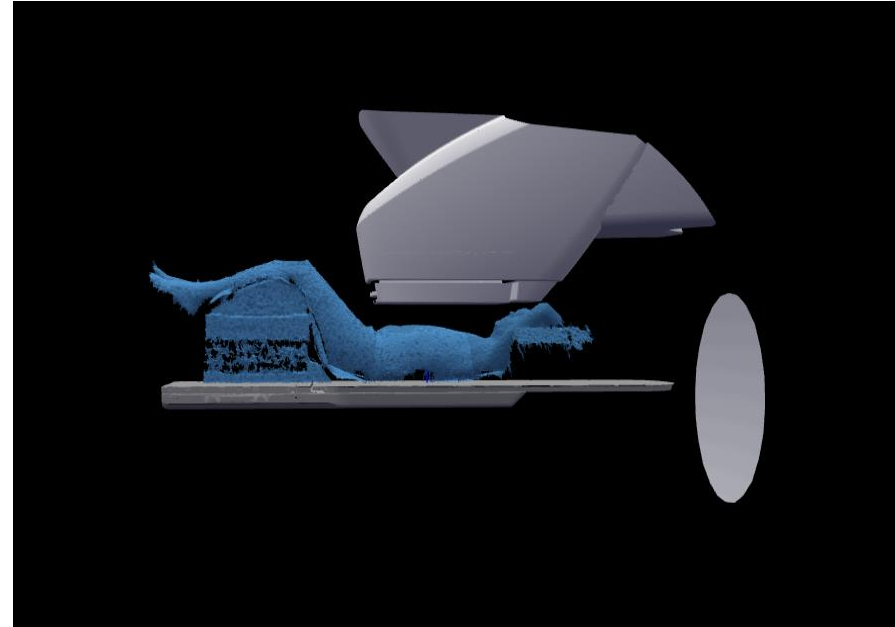
Who is eligible for MapRT?

- How should we allocate patients, and when will MapRT be beneficial?
- Collision risk can be hard to assess in CT
- What kind of collisions can we encounter?

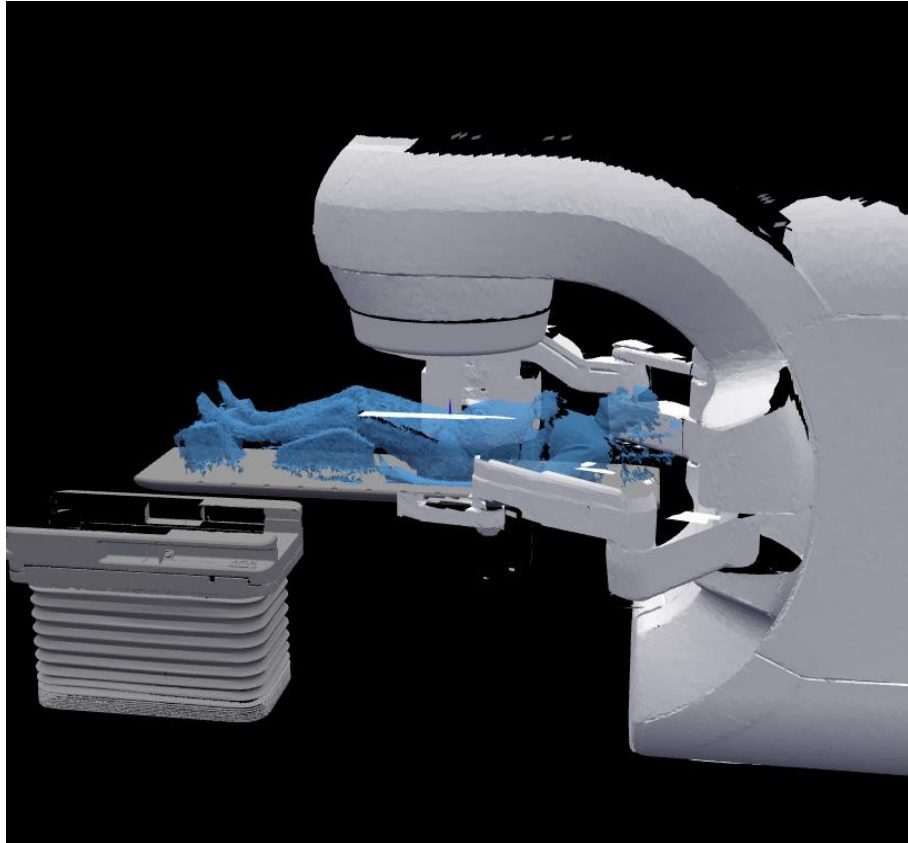
Extremities



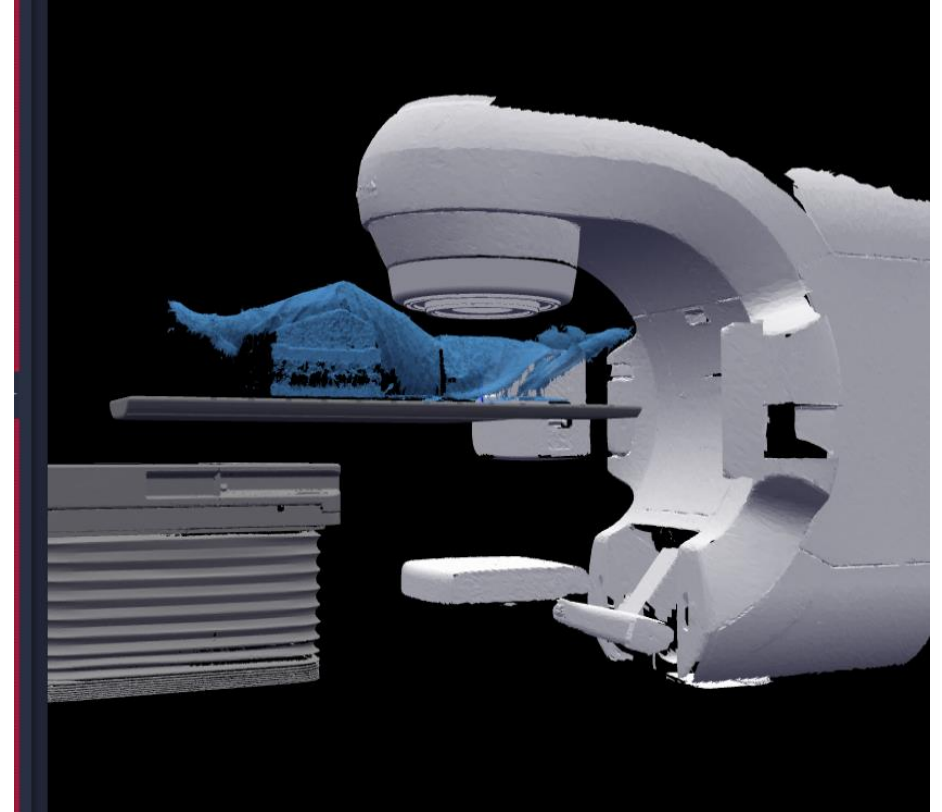
Proton



Large buildup
under the head

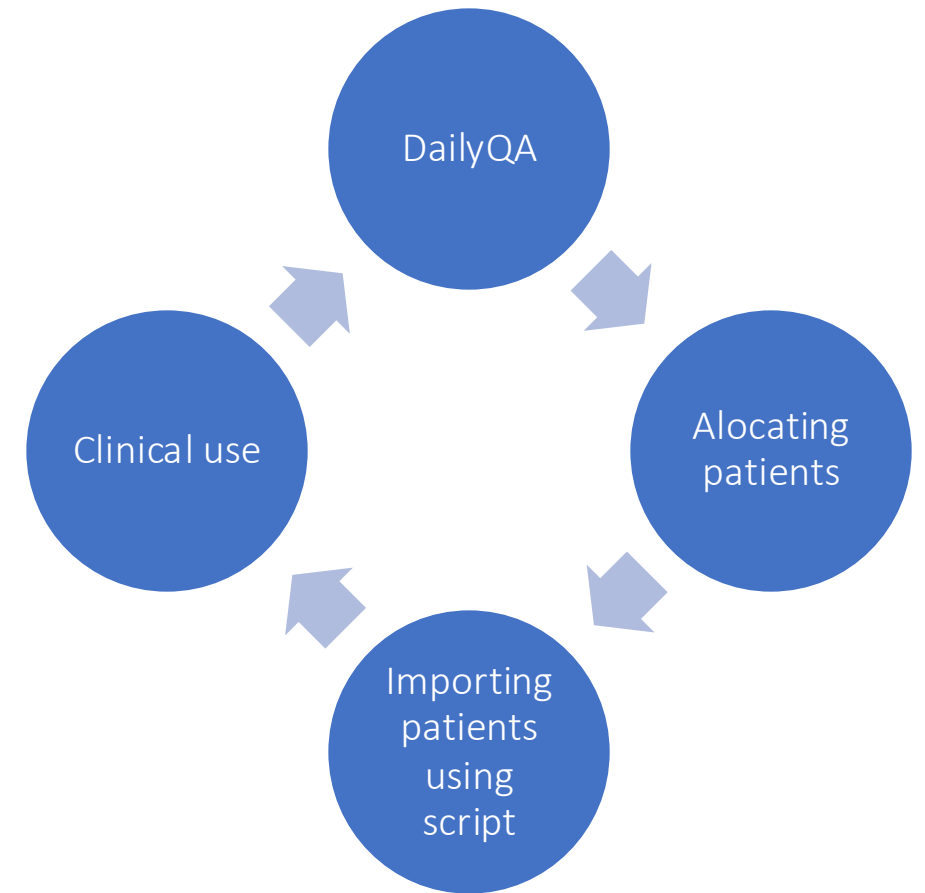


Lungs and breast
patients



Workflow from a CT perspective

- Daily QA
- Deciding on what patients will benefit from MapRT
- Sim-RT patient registration script adapted for MapRT
- Clinical use



MapRT in RayStation



Patient data management | Patient modeling | Plan design | Plan optimization | Plan evaluation | QA preparation | Treatment adaptation

Image registration | Structure definition | Deformable registration

ROI tools | Select layout | New ROI geometry | Fusion | Current ROI | Contouring | Interpolation | 3D editing | Extras

Interpolate | Couch removal | Delete contour | Copy contour | Simplify contours | Delete component | Paste contour | Remove holes | Keep component | Move to slice intersection

2D Image Material 3D | Plan dose: TEST MAPRT Video (AIP - 2026.03.24) | No dose | % of 55.00 Gy

140.0
130.0
120.0
110.0
100.0
95.0
90.0
85.0
80.0
70.0
50.0
30.0
10.0

CT: AIP - 2026.03.24
SRA_CT12_24
Transversal: 25.40 cm
Slice 165/172

Image set library
 Primary: AIP - 2026.03.24 | Secondary: MIP - 2026.03.24

AIP - 2026.03.24 (Primary) | Modality: CT | MIP - 2026.03.24 (Secondary) | Modality: CT | 2026.03.24 Pustefaser | Type: 4DCT

2D Image Material 3D | Plan dose: TEST MAPRT Video (AIP - 2026.03.24) | No dose | % of 55.00 Gy

140.0
130.0
120.0
110.0
100.0
95.0
90.0
85.0
80.0
70.0
50.0
30.0
10.0

CT: AIP - 2026.03.24
SRA_CT12_24
Sagittal: 8.85 cm

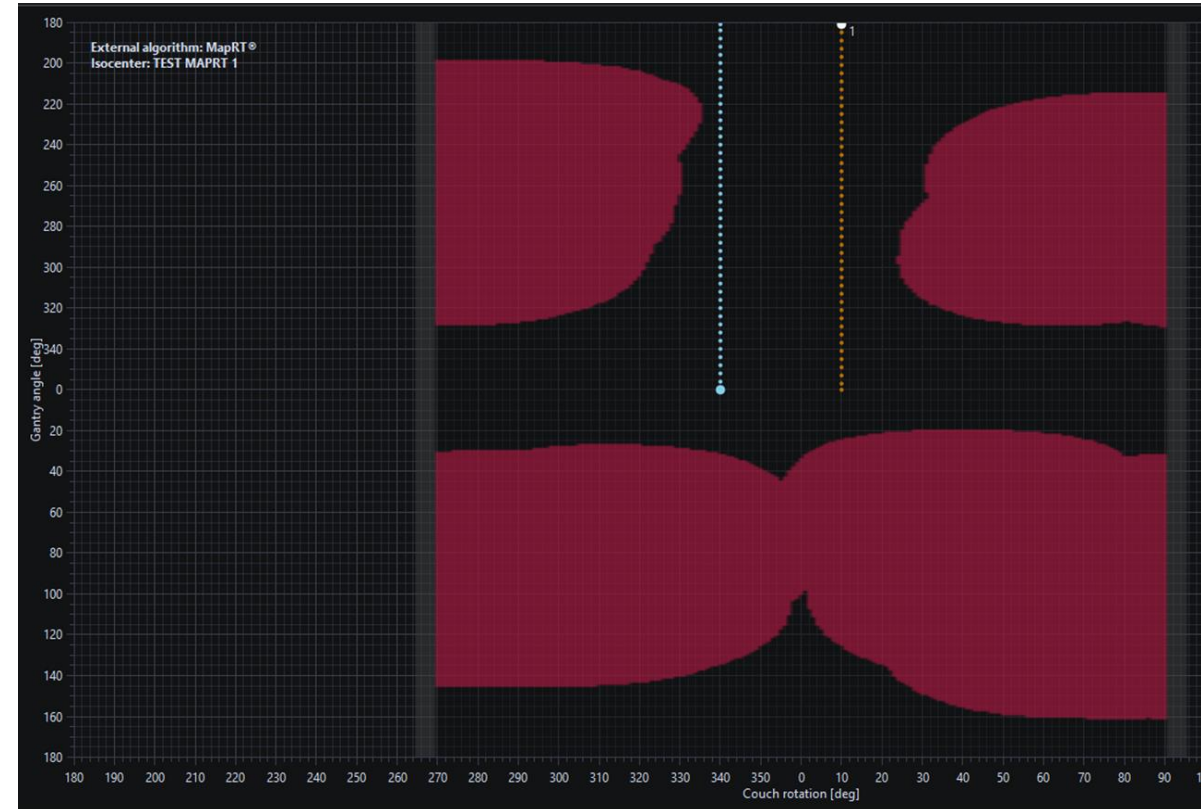
2D Image Material 3D | Plan dose: TEST MAPRT Video (AIP - 2026.03.24) | No dose | % of 55.00 Gy

140.0
130.0
120.0
110.0
100.0
95.0
90.0
85.0
80.0
70.0
50.0
30.0
10.0

CT: AIP - 2026.03.24
SRA_CT12_24
Coronal: 16.14 cm

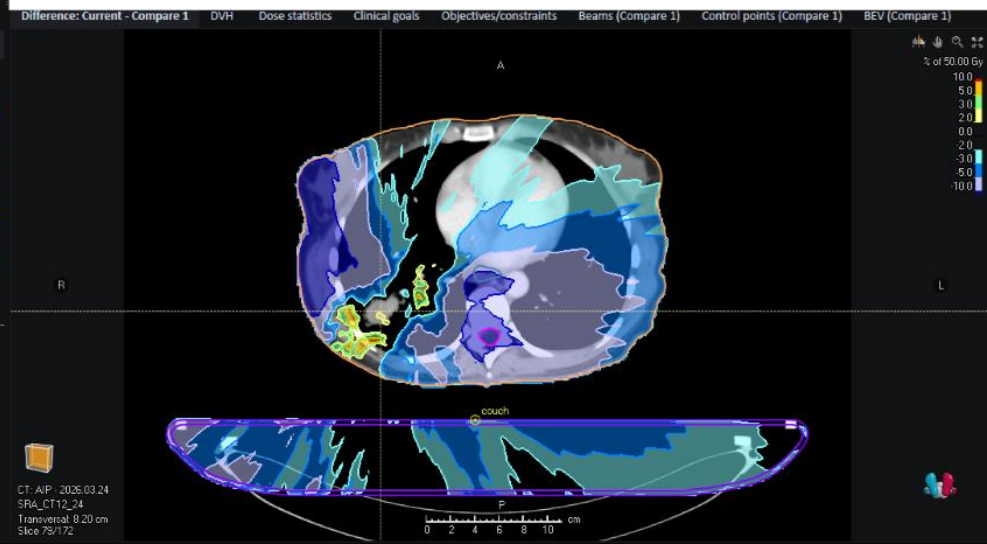
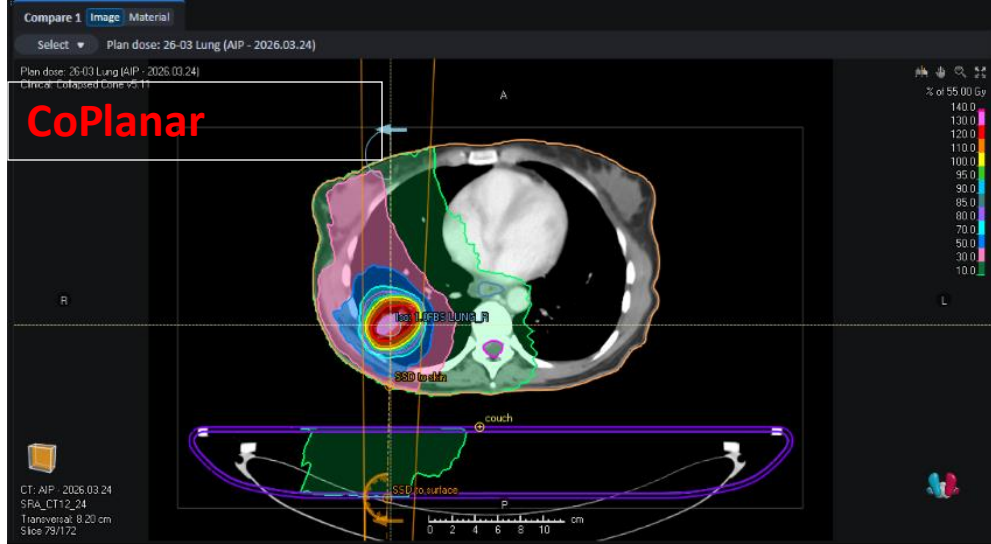
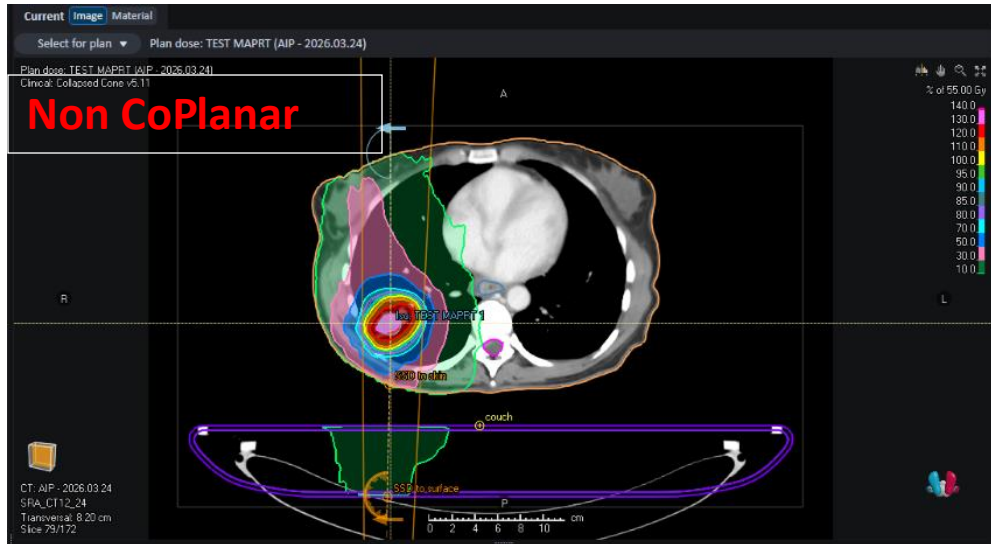
Clearance Map

- Easy to see which combinations of gantry angles and couch angles that don't result in a collision with either patient or fixation equipment
- Example: For this right sided lung patient, rotation on the contra lateral side would result in a collision. Illustrated by the red areas.



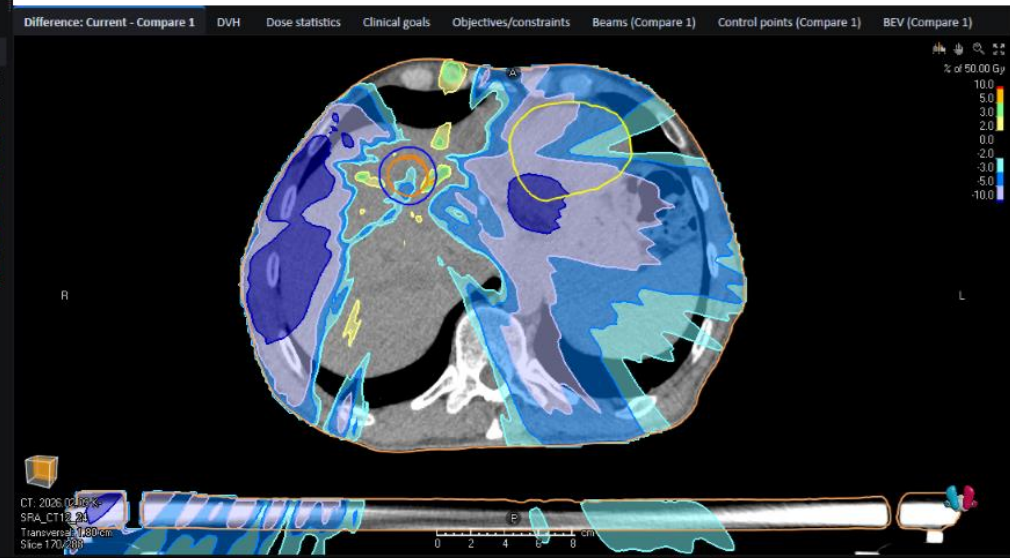
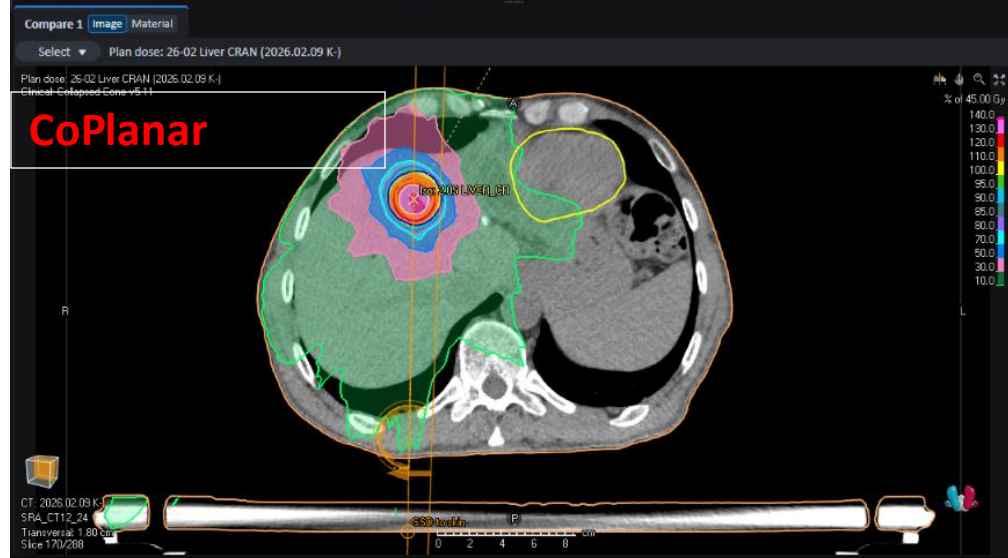
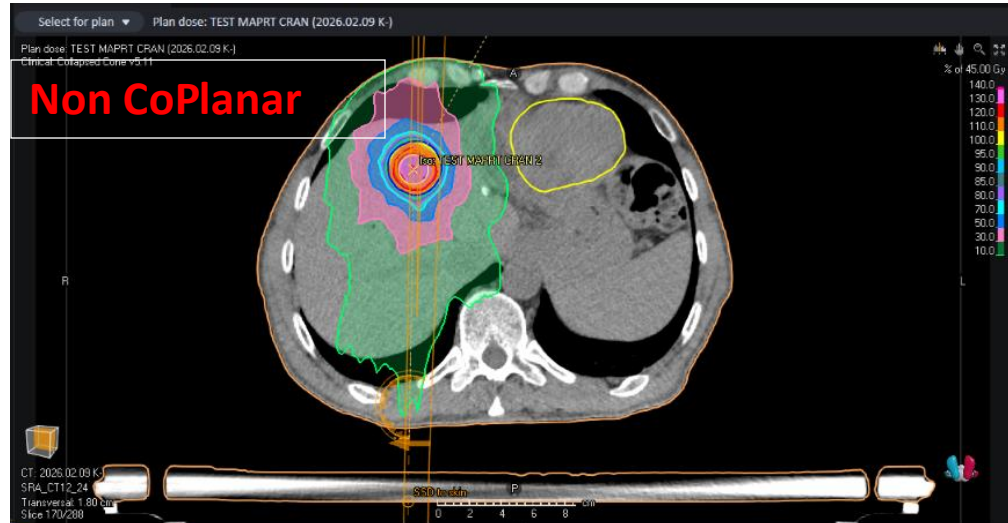
Lung

- 5 Gy lower max dose to spinal canal
- 3 Gy lower max dose to esophagus
- Better conformity

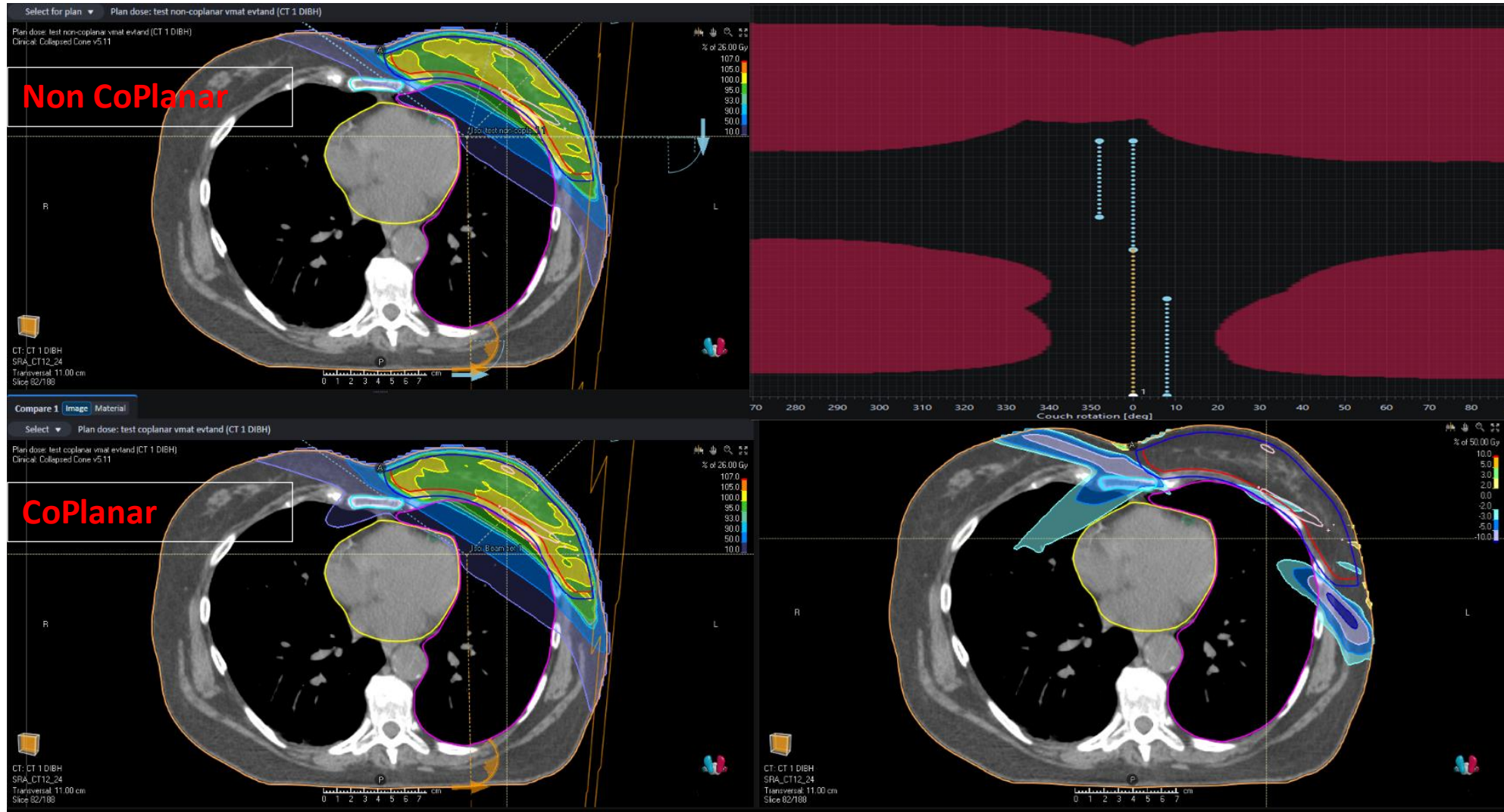


Liver

- Lower dose to the heart
- Slightly lower dose to stomach and esophagus

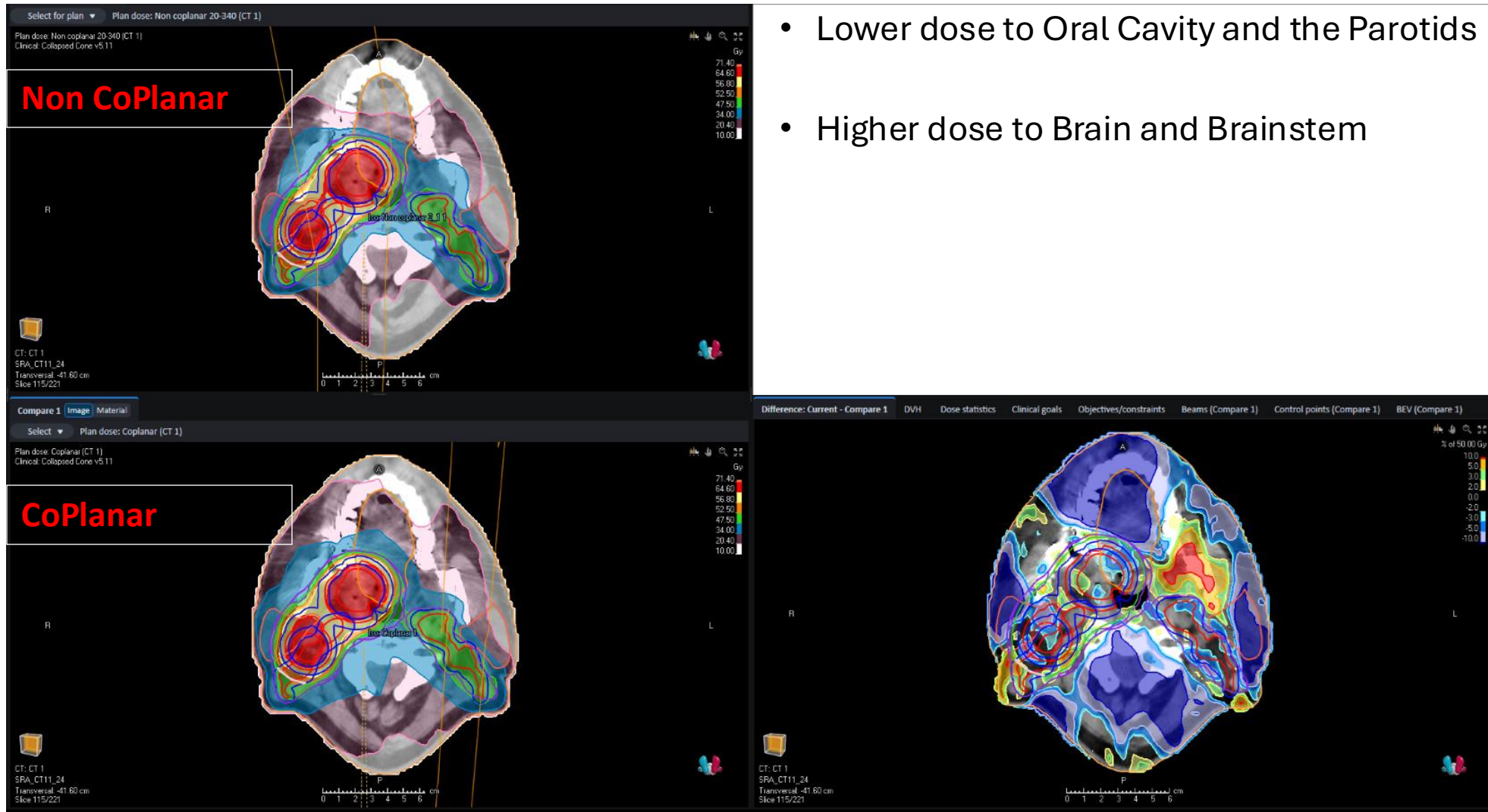


Breast, 5.2 Gy x 5 fx, VMAT



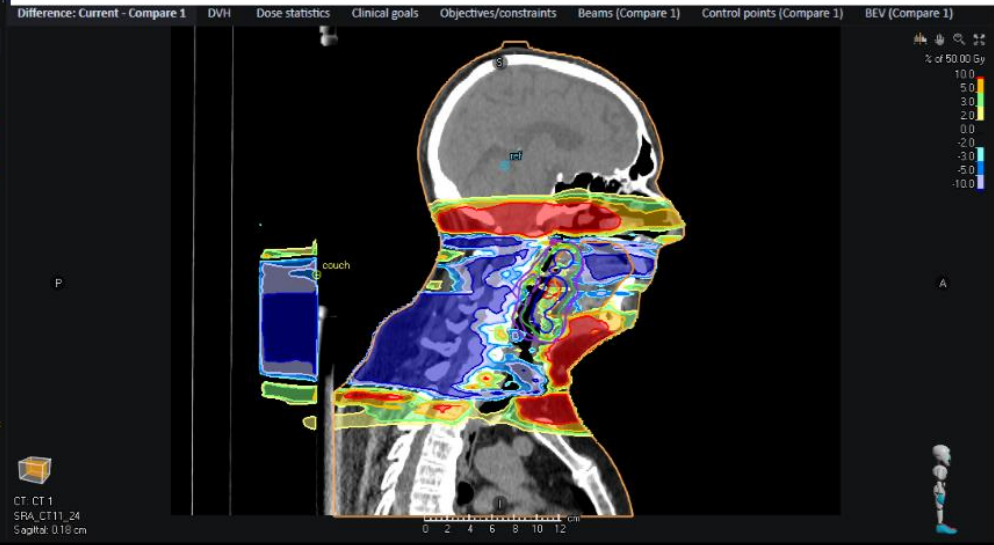
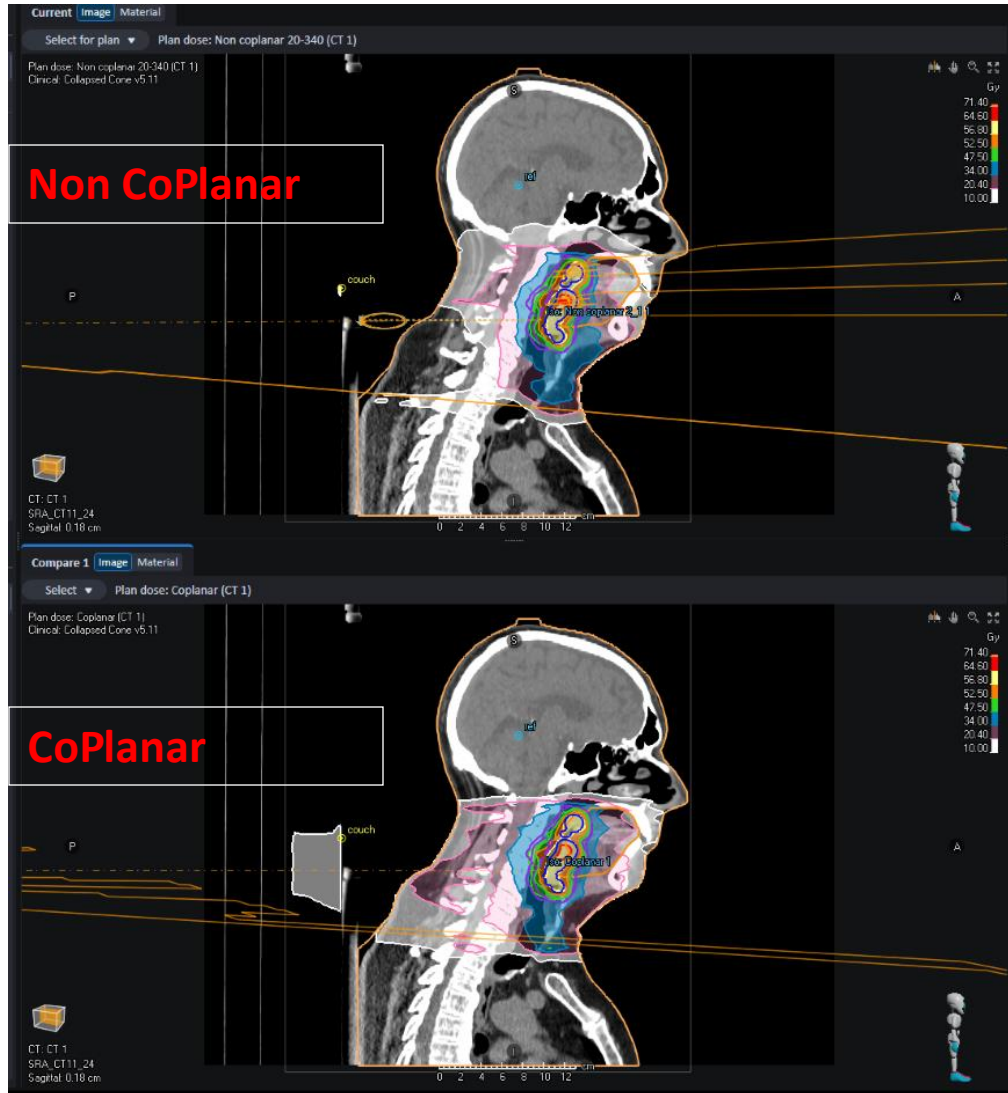
Head and Neck

- Lower dose to Oral Cavity and the Parotids
- Higher dose to Brain and Brainstem



Drawbacks

- Higher dose in the cranial and caudal areas
- For head and neck this means higher brain dose



FB CT VS. MAPRT

