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The Use of SGRT to Adapt to Acute Patient Mobility Deterioration: A Clinical Case-Study.

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Acknowledgement of Country

Peter Mac respectfully acknowledges the Traditional Owners of the lands of the Kulin Nation. We pay our respect to Elders, past and present.

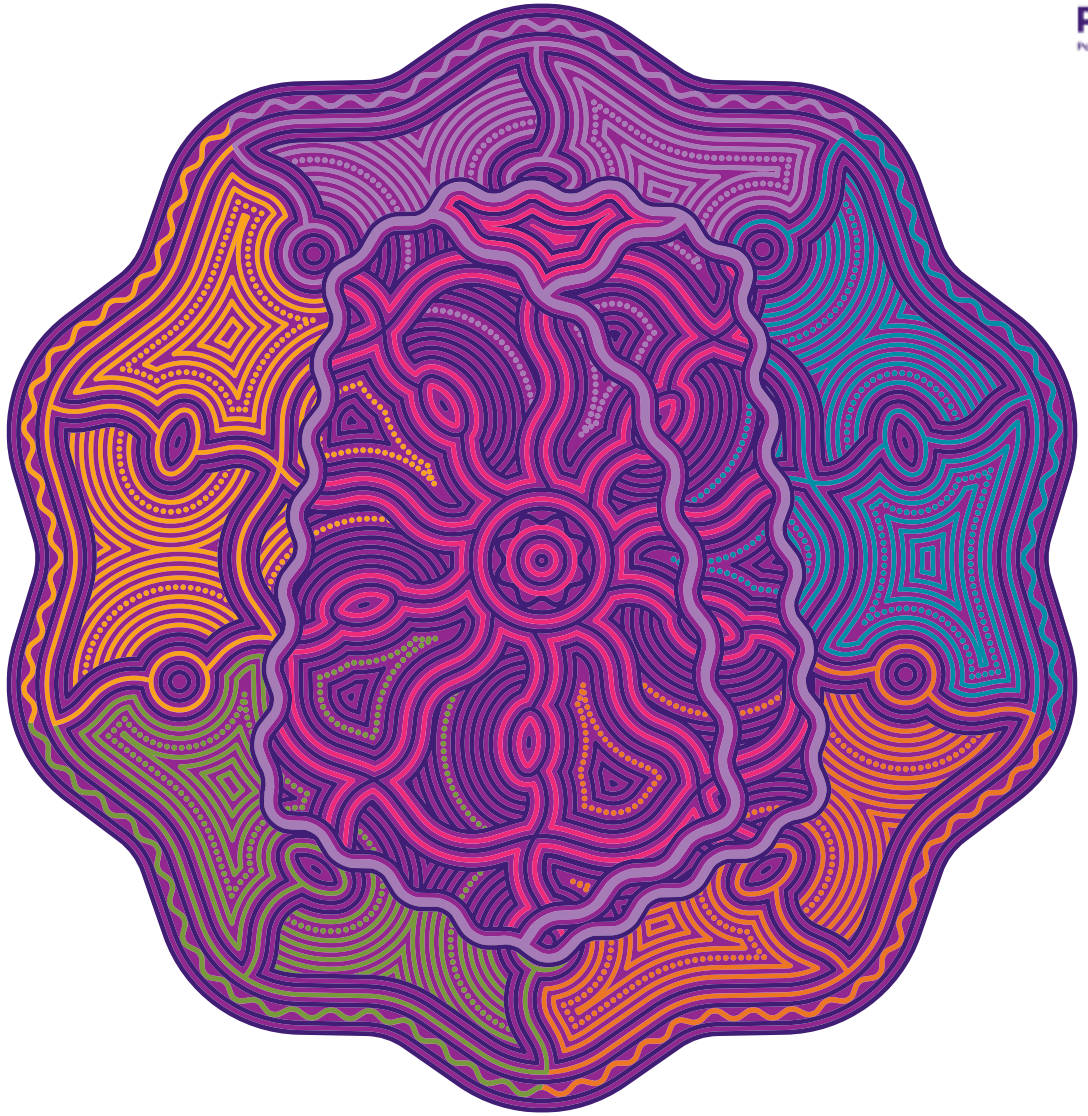
We acknowledge the Traditional Owners of the lands on which our six sites are located throughout Victoria.

Parkville, Elizabeth Street, Box Hill, East Melbourne and Sunshine: Lands of the Wurundjeri Woi-Wurrung People of the Kulin Nation

Bendigo: Lands of the Dja Dja Wurrung People of the Kulin Nation

Moorabbin: Lands of the Boon Wurrung People of the Kulin Nation

We acknowledge that First Nations Peoples are the Traditional Owners of this land. Their care of, and connection to these lands, waters and skies has been continuous for tens of thousands of years. We recognise their strength and resilience and pay our respects to their Elders past and present.



SGRT for Breast

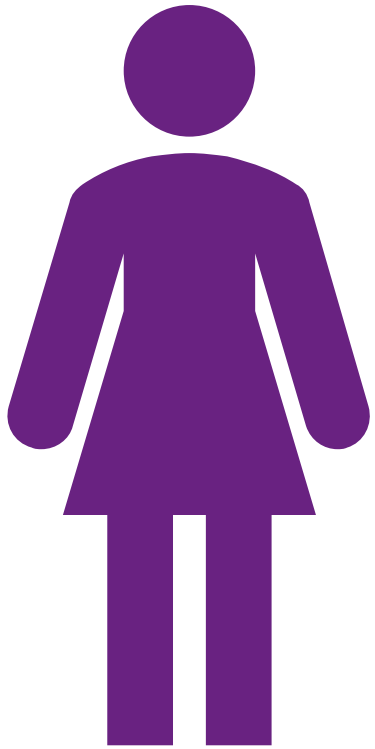
- SGRT plays an integral part in managing intra & inter-fractional motion (Macedo-Jiménez et al, 2025) .

- The use of systems such as Align RT ensure real time monitoring of the current surface compared to a previous reference captured surface (González-Sanchis et al, 2021).

- The standard work-flow at our clinic involves both arms up on a sabella flex allowing for a stable and reproducible position.

Introduction to the Patient

- Age 56-year-old female
- Dx: Aggressive Pleomorphic lobular carcinoma
- Mgmt: Wide local excision -> short course chemotherapy ->adjuvant RT



2006 Pt was diagnosed with BRCA2 mutation based on family history

2011 Diagnosed with Ductal Carcinoma In Situ

2017 Diagnosed with lobular carcinoma with microinvasion of the left breast.

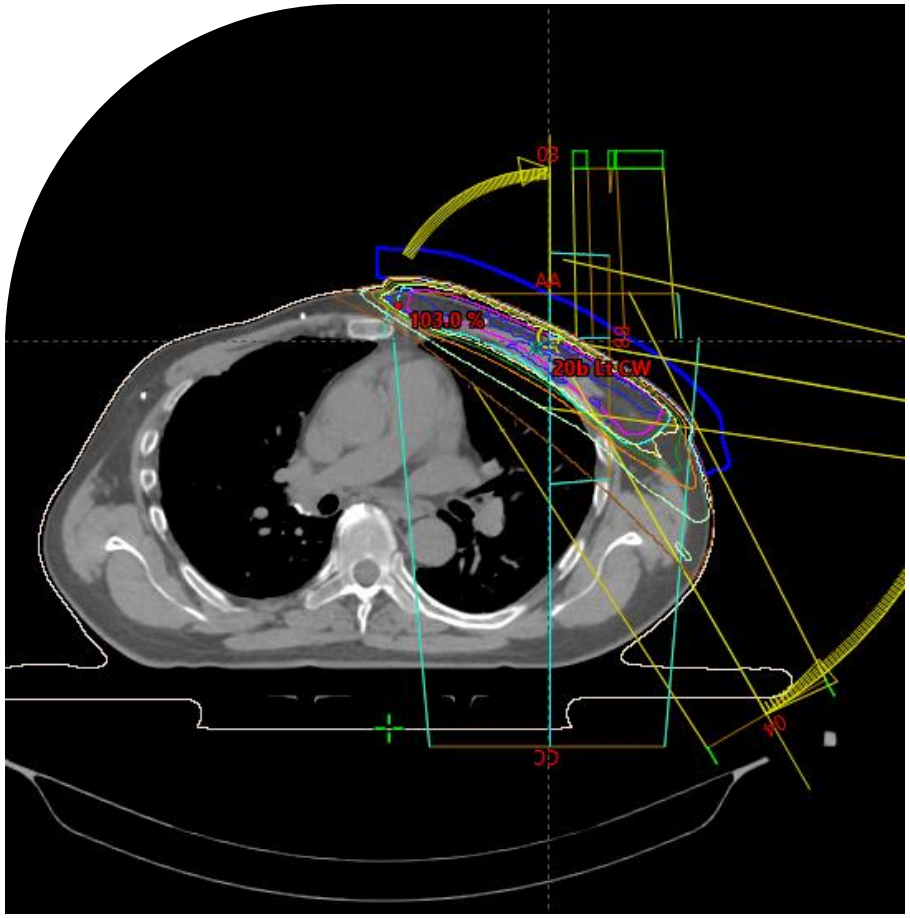
2025 Recurrence of lobular carcinoma of left breast

The Treatment Plan

- Radiation Therapy to follow chemotherapy. Patient was prescribed 40 Gy in 15fx to the left chest wall with 3D printed bolus.

- With the history of previous treatment and bolus placement it was important for the soft tissue contour on the chest wall to be maintained so that any planned overlap is also maintained.

- During pre-planning and initial treatment, the patient demonstrated typical mobility: allowing for both arms up.



The Conundrum

The Problem

Patient arrived for treatment on fraction four with a pinched nerve on their contralateral arm unable to raise past shoulder.

The work-around

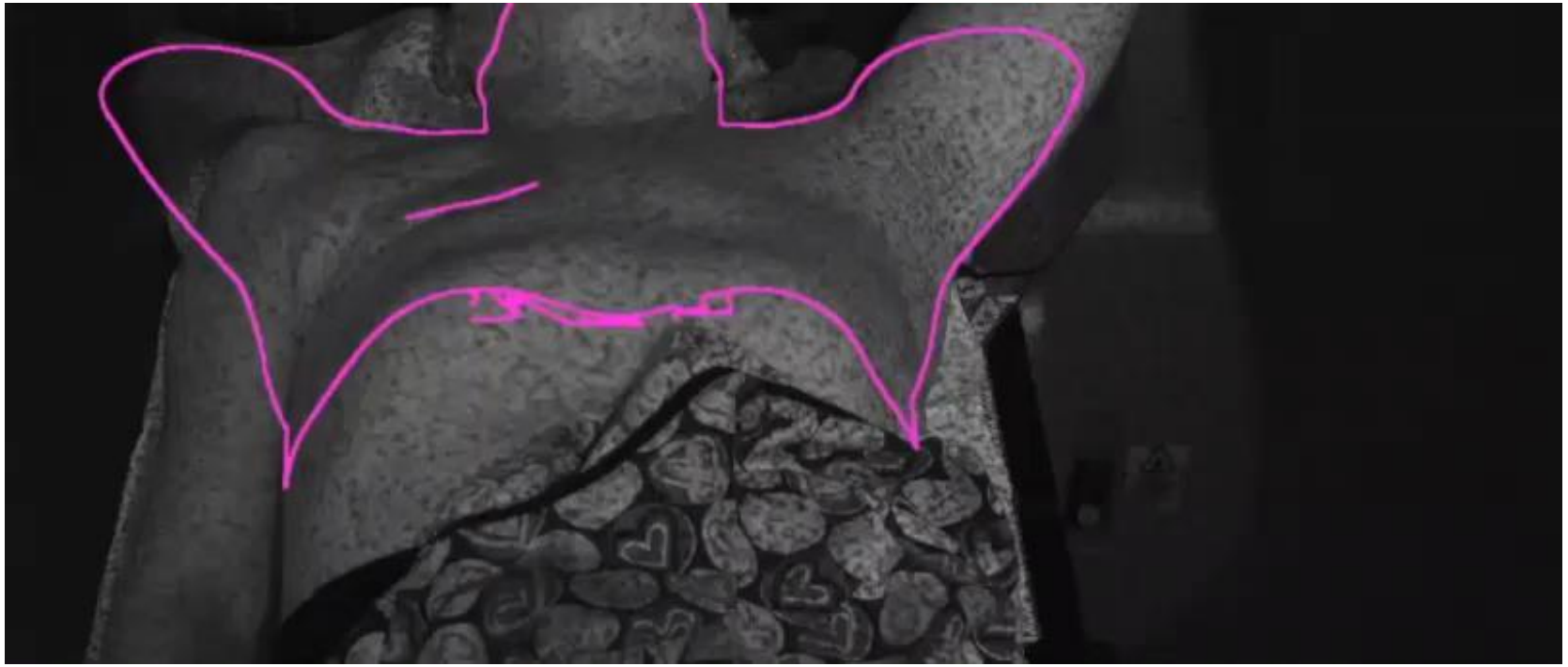
Treating radiation therapists used the postural video on AlignRT Advance (Vision RT, London, UK) to align the ipsilateral anatomy.

The Solution

A kV-kV match was completed followed by a CBCT on two consecutive days to verify contour and internal anatomy before a surface capture was acquired and used for the remaining treatment.

The Postural Video

The aim was to maintain the left arm and chest wall contour whilst replicating the right clavicle and chest wall position from CT as much as possible to reduce differences in contour.



Consent has been obtained to share this video

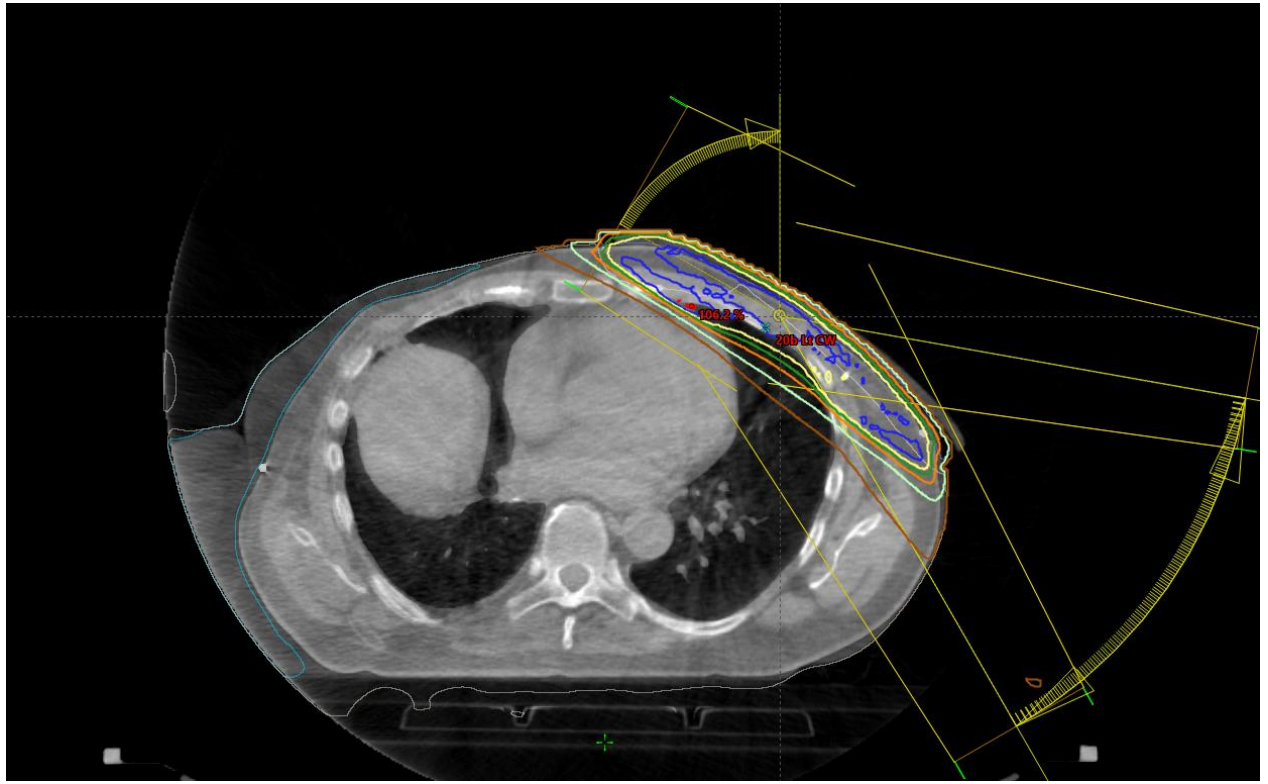
The Dose Distribution

Difference in dose?

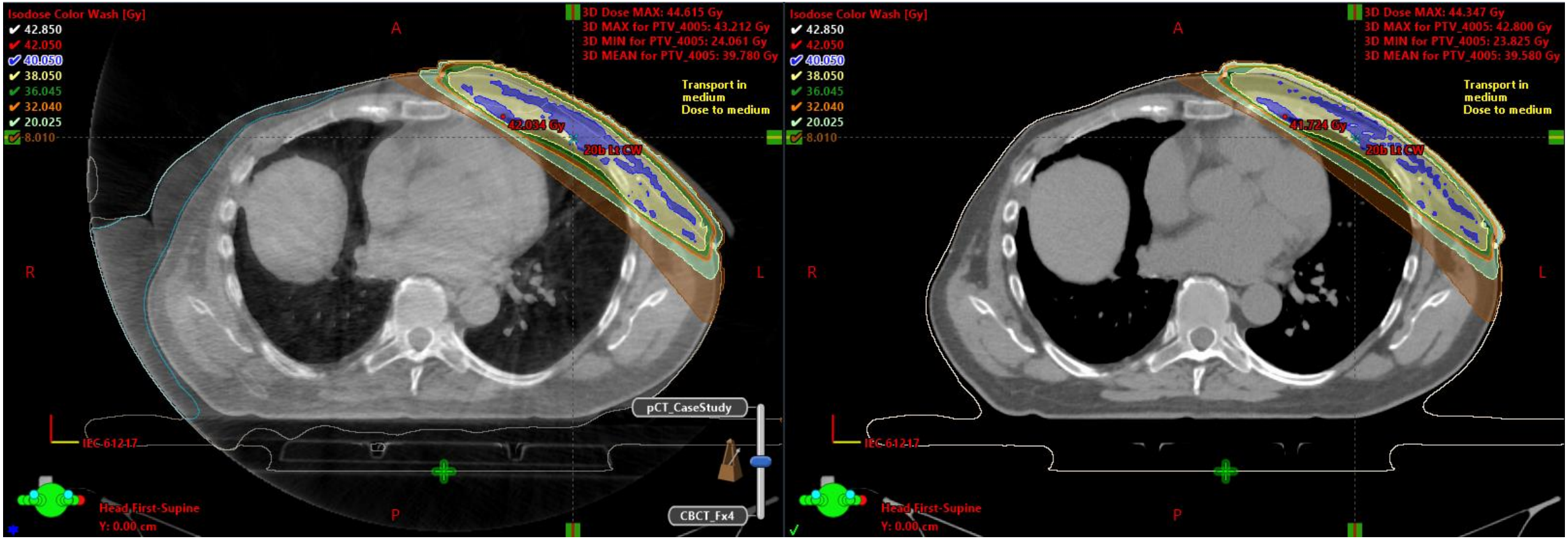
To assess any changes in the dose distribution the original dataset was copied and the change in contour was added as part of the outer body contour.

The plan was copied on to the modified dataset and calculated dose with forced MU's.

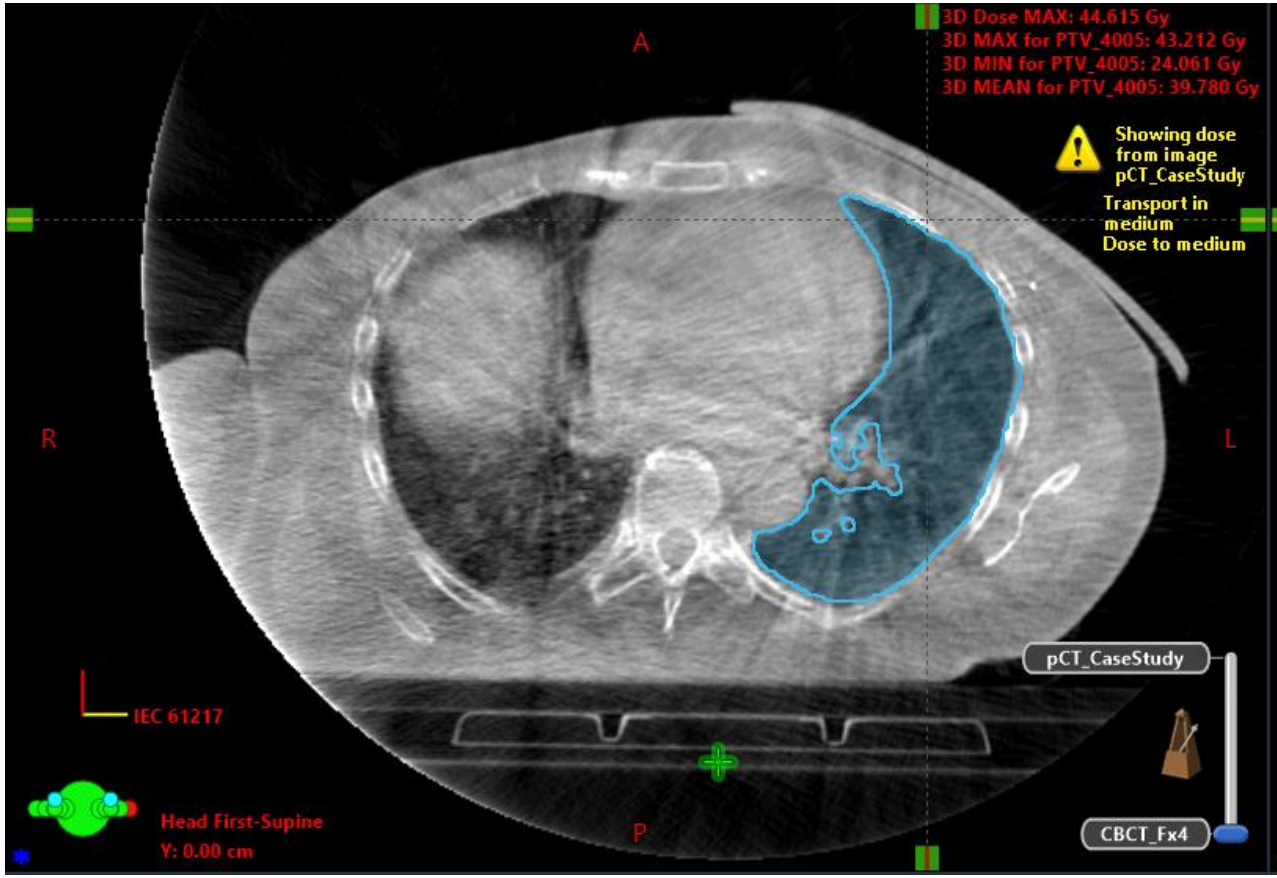
There was no significant change to the dosimetry as assessed visually and on DVH for targets and organs at risk.

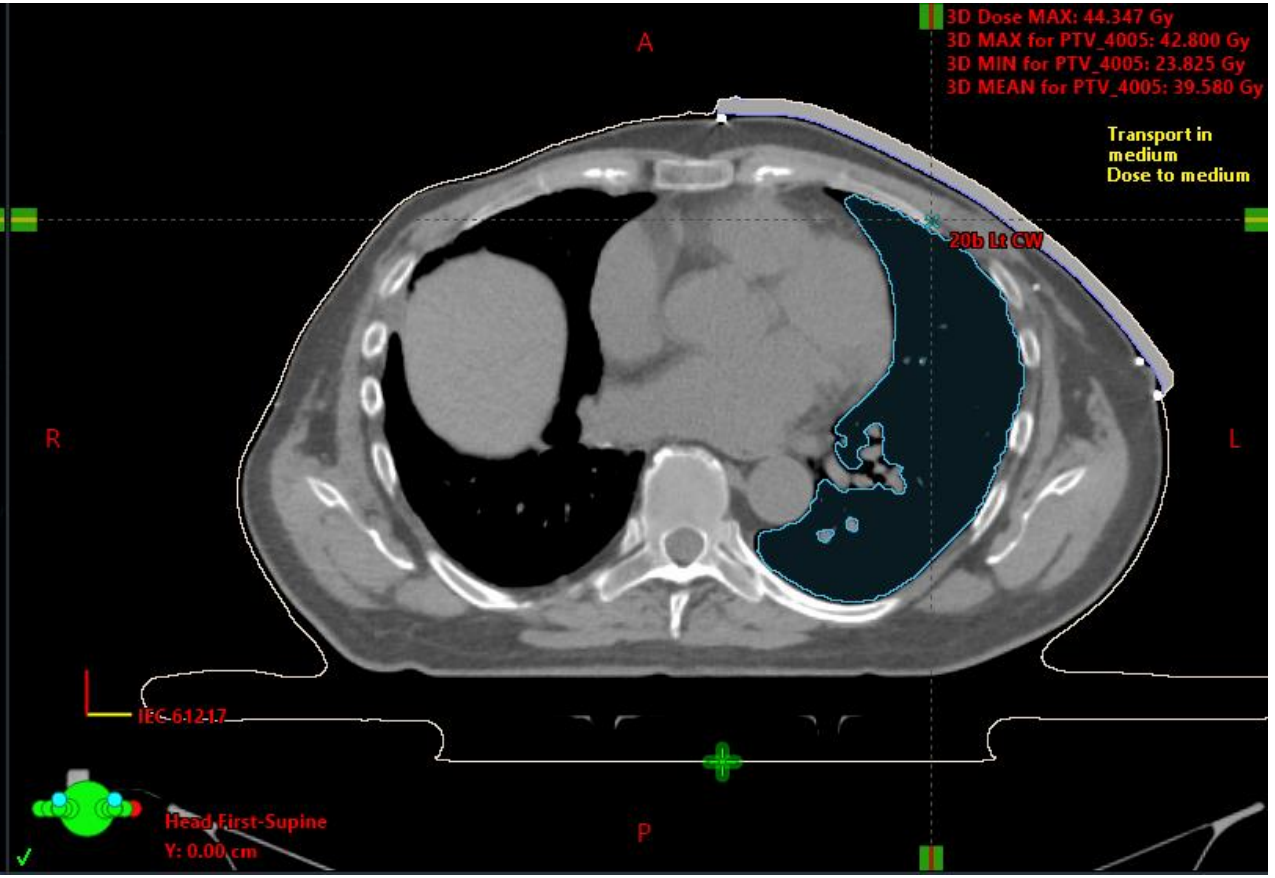


Plan Comparison

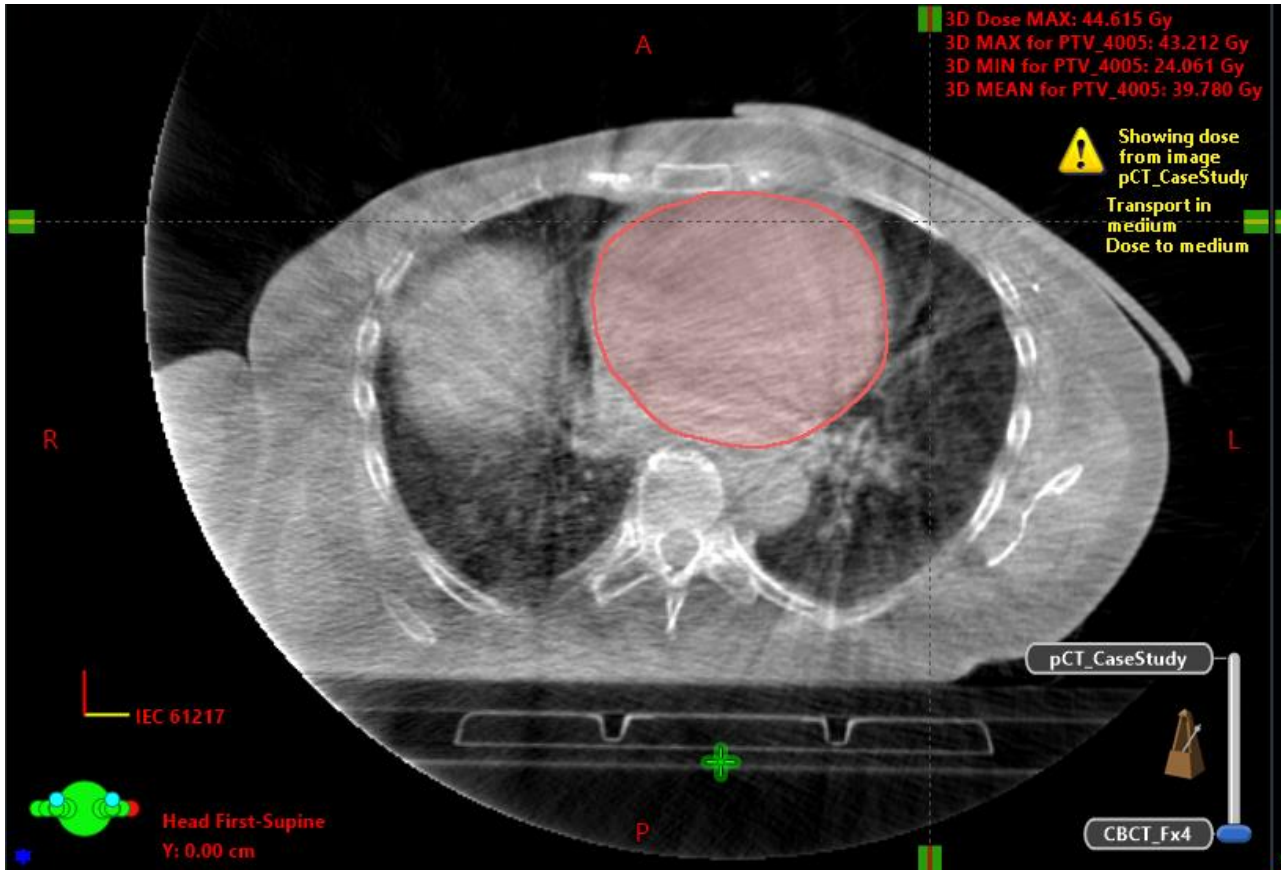


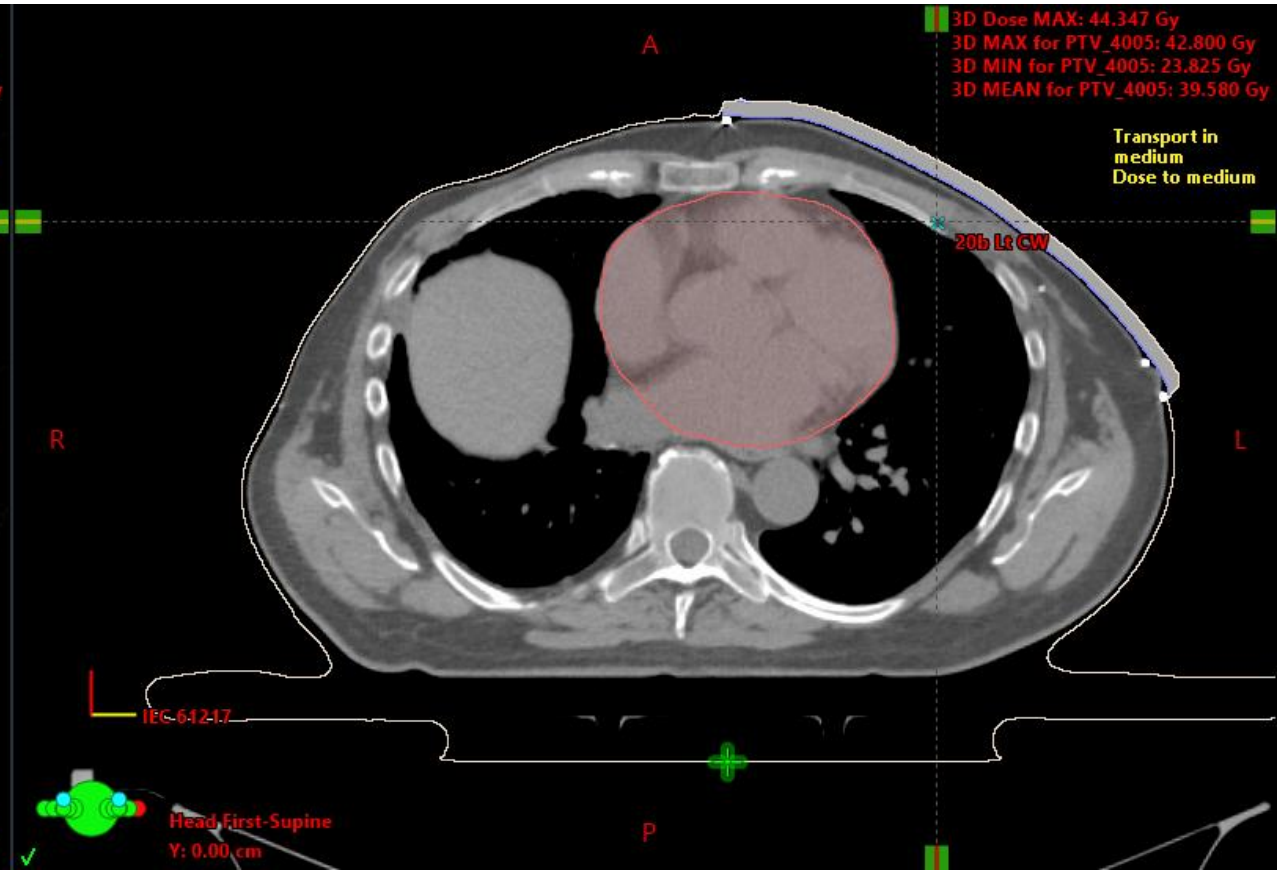
Organs at Risk – Ipsilateral Lung





Organs at Risk – Heart



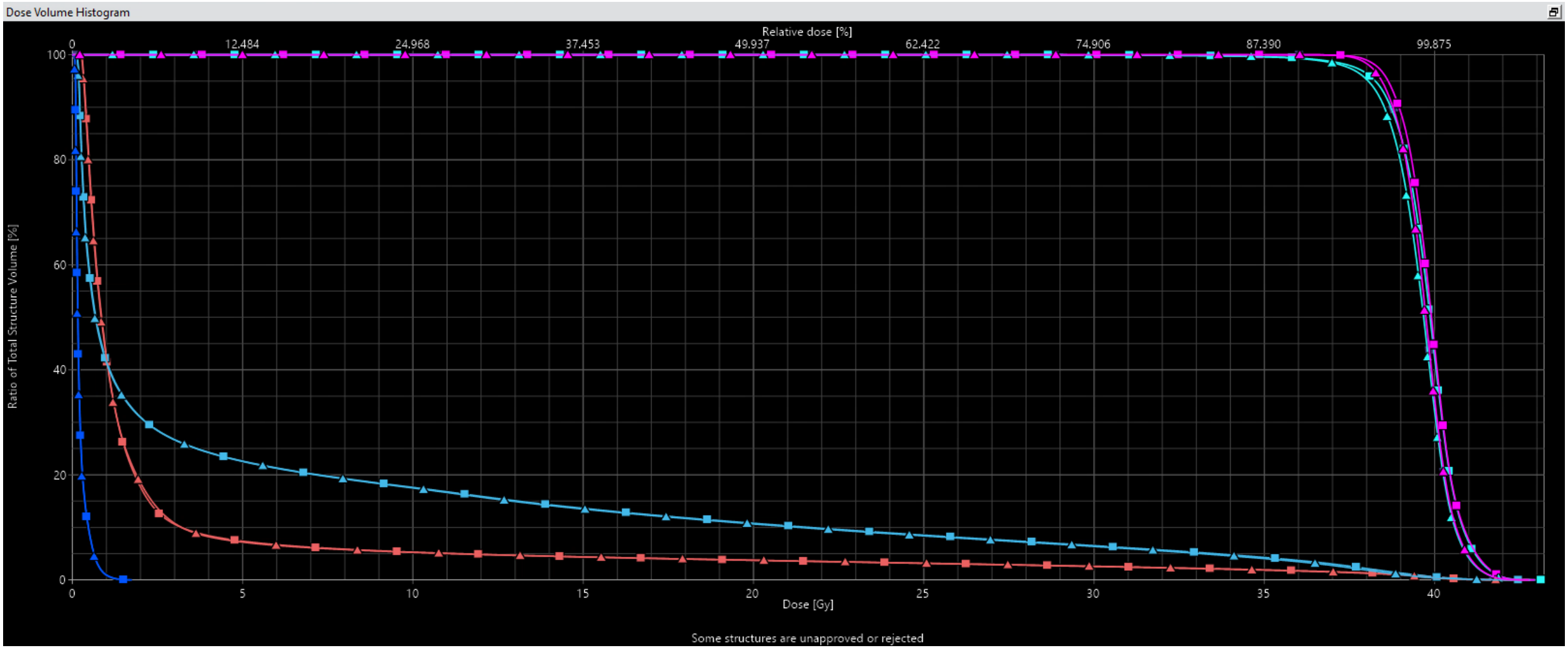


Metrics

Overview

Clinical goals: All Plans ☐ Evaluate Goals for All Plans

Plan			■ Lt CWBU_UFT			▲ LtCWCaseStudy		
Total Dose			40.050 Gy			40.050 Gy		
Clinical Goal Summary			1	0	7	0	0	8
PTV_4005	P1	D 2.0 % < 42.05 Gy	41.31 Gy			41.59 Gy		
	P1	D 90.0 % > 36.05 Gy	38.52 Gy			38.71 Gy		
	P2	D 95.0 % > 38.05 Gy	38.05 Gy			38.26 Gy		
Heart	P1	D 5.0 % < 20.00 Gy	11.13 Gy			11.32 Gy		
	P1	Dmean < 3.00 Gy	2.58 Gy			2.60 Gy		
Lung_L	P2	V 16.00 Gy < 15.0 %	12.86 %			12.99 %		
	P3	V 5.00 Gy < 50.0 %	22.56 %			22.62 %		
Lung_R	P4	V 5.00 Gy < 5.0 %	0.00 %			0.00 %		


Dose Volume Histogram
Relative dose [%]
0
12.484
24.968
37.453
49.937
62.422
74.906
87.390
99.875
100
80
60
40
20
0
Ratio of Total Structure Volume [%]
0
5
10
15
20
25
30
35
40
Dose [Gy]
Some structures are unapproved or rejected

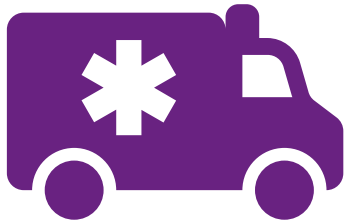
Change in Contour and Field Placement

Note: The change in soft tissue occurs beyond the most medial field's entry point

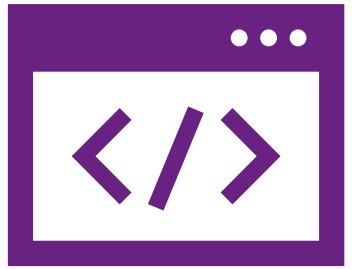
Limitations

Did not take a dose calc CBCT. If we had, we could have copied the plan directly on to the CBCT to re-calculate and assess dose without the need to replicate soft tissue changes.

Conclusion



In an ordinary situation this would have warranted the patient being rescanned and replanned with their arm down.



With the use of SGRT we were able to adapt the protocols.

Thank you

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