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INTRODUCTION OF ALIGNRT AND THE ROLL OUT OF DIBH FOR MEDIASTINAL LYMPHOMA

- Jayne Fletcher and Lisa Telford
- Treatment delivery team leaders
- Rosemere Cancer Centre

DEPARTMENT OVERVIEW

- Centre is in Preston in the North-West of England
- Treats patients from Cumbria, most of Lancashire and Fylde Coast
- Treats up to 230 patients per day
- One XStrahl superficial machine
- 2 Phillips wide bore CT scanners
- 8 Elekta linacs, 2 Harmony, 6 Versa HD
- Went live with SGRT Jan 2023, 99% of treatment delivery staff competent
- All systems funded by our charity Rosemere Cancer Foundation
- All CT scanners and linacs have SimRT or AlignRT installed
- Treat all breast, all thorax, multiple SABR sites, pelvic and all palliatives with SGRT

RCC STAFF OVERVIEW

50 rotational radiographers(band 5 and 6)

9 band 7 treatment team leaders

1 8a treatment lead

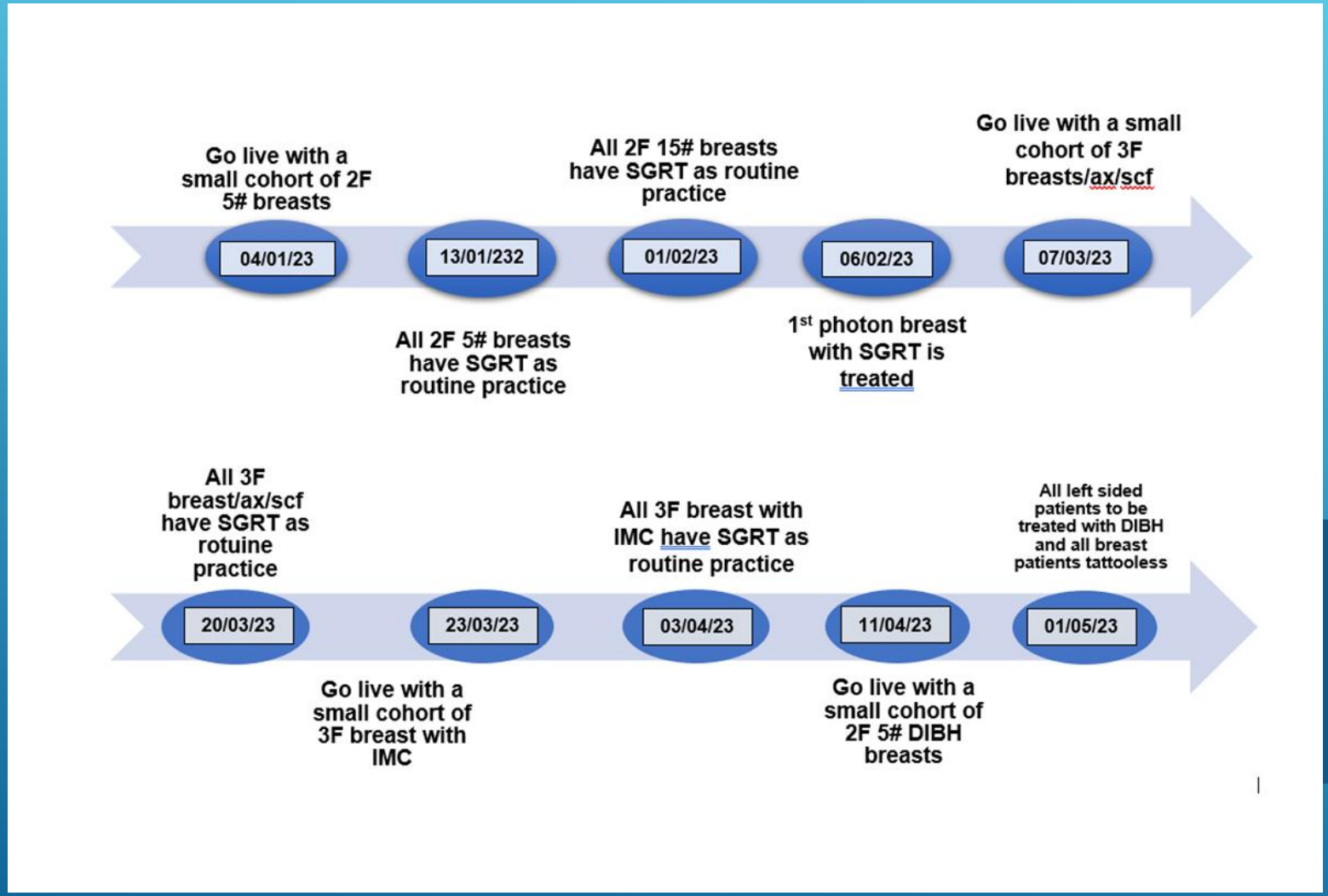
1 8a continuous improvement lead

10 pre treatment radiographers

3 pre treatment band 7 team leaders

1 8a pre treatment lead

SGRT GO LIVE TIMELINE



Service expanded to Radical Thorax 06/09/23

Timing audit data

	PRE SGRT AVE (IN THE ROOM)	POST SGRT AVE (IN THE ROOM)	POST SGRT AVE (ON THE BED)
2F Breast (daily kv planar-online review)	18 MINS	15 MINS (range 10-20 mins)	13 MINS
3F Breast (mv day 1,2 -online review)	22 MINS	16 MINS (range 11-30 mins)	13 MINS
3F Breast with IMC (daily CBCT-online review)	25 MINS	20 MINS (range 10-30 mins)	16 MINS
Photon Breast Boost (daily CBCT-online review)	17 MINS	17 MINS (range 11-30 mins)	14 MINS
DIBH (2F, daily kv planar-online review)	30 MINS	22 MINS (range 14-26 mins)	17 MINS
Radical Thorax (daily CBCT-online review)	15 MINS	13 MINS (range 10-18 mins)	11 MINS

STAFF ENGAGEMENT

Key aspect of implementation plan was onboarding the radiographic staff

Band 6 radiographer on super user training

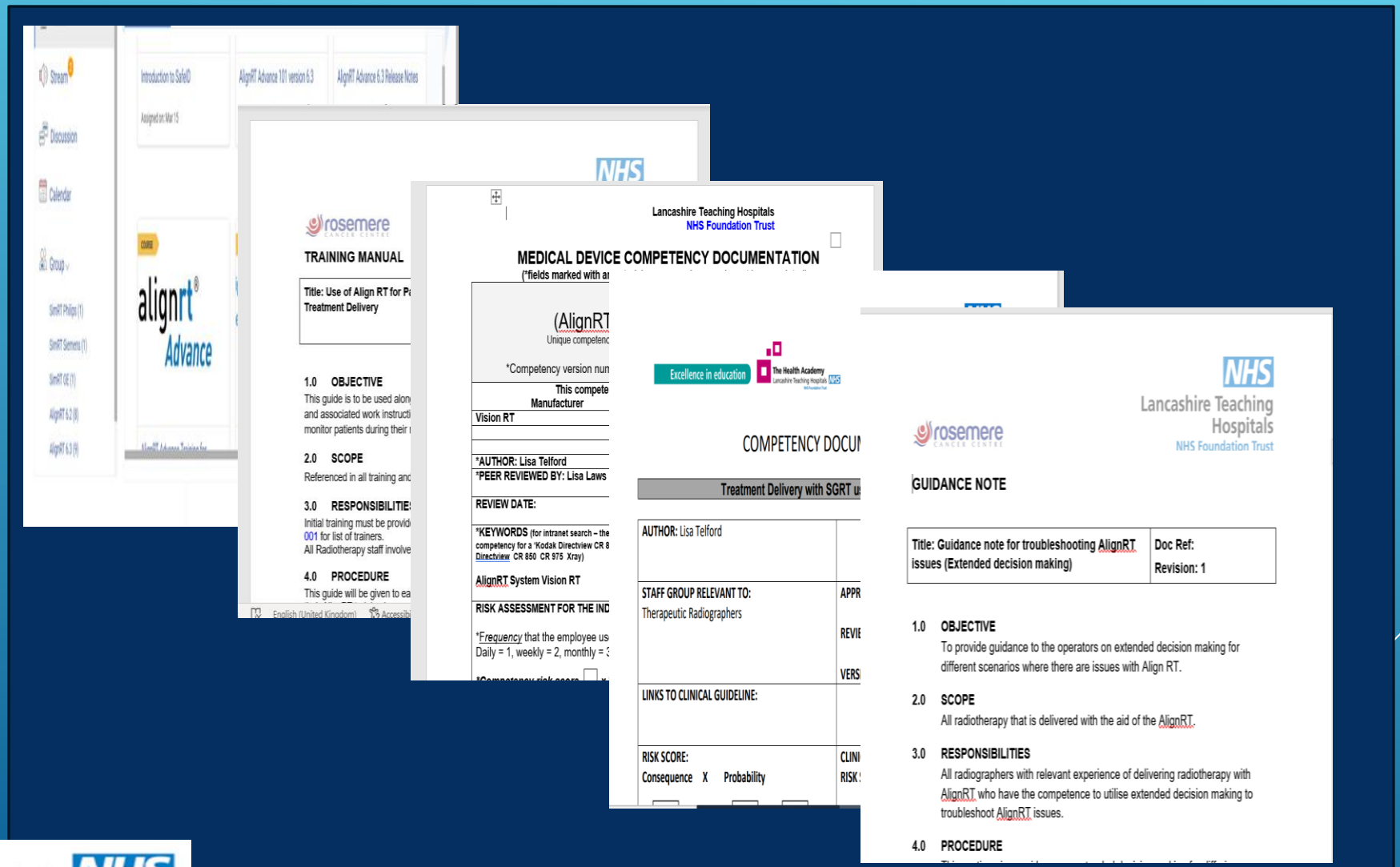
Education sessions were delivered to widen knowledge of SGRT and the capability of AlignRT/SimRT systems

AlignRT online learning

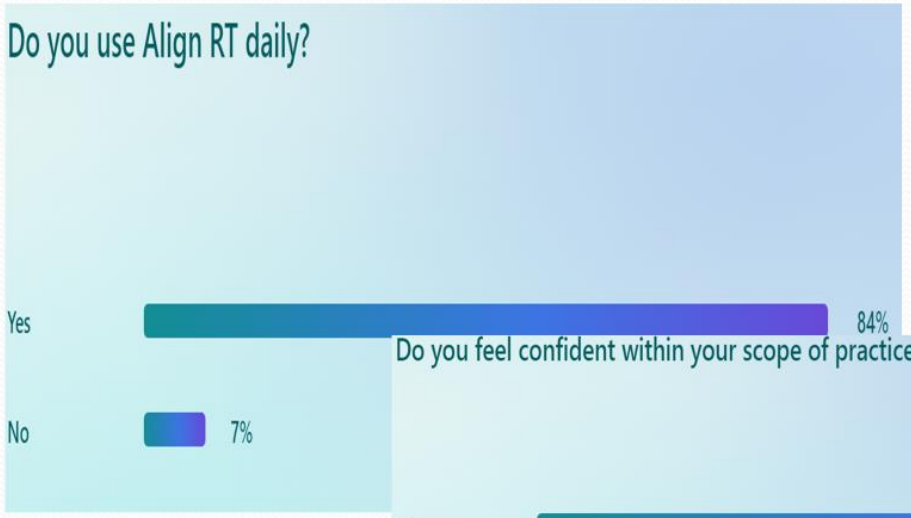
AlignRT application training

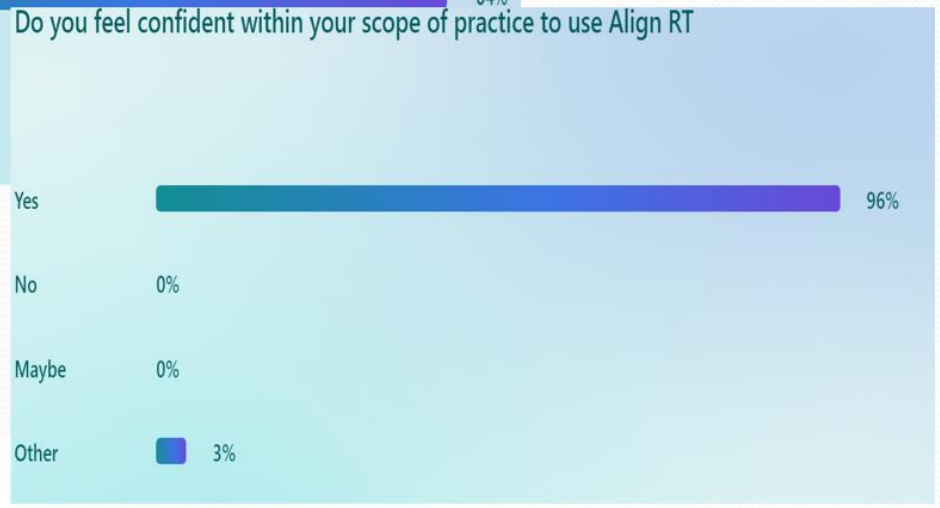
Super user support

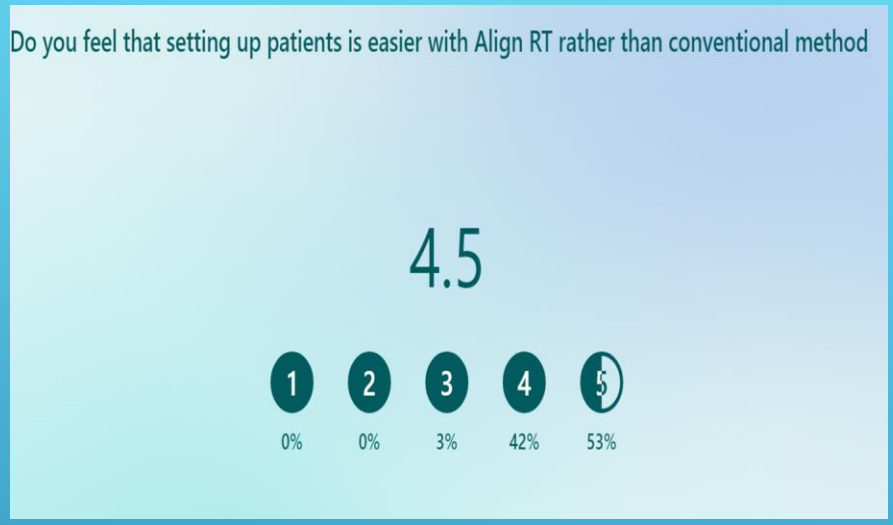
STAFF TRAINING

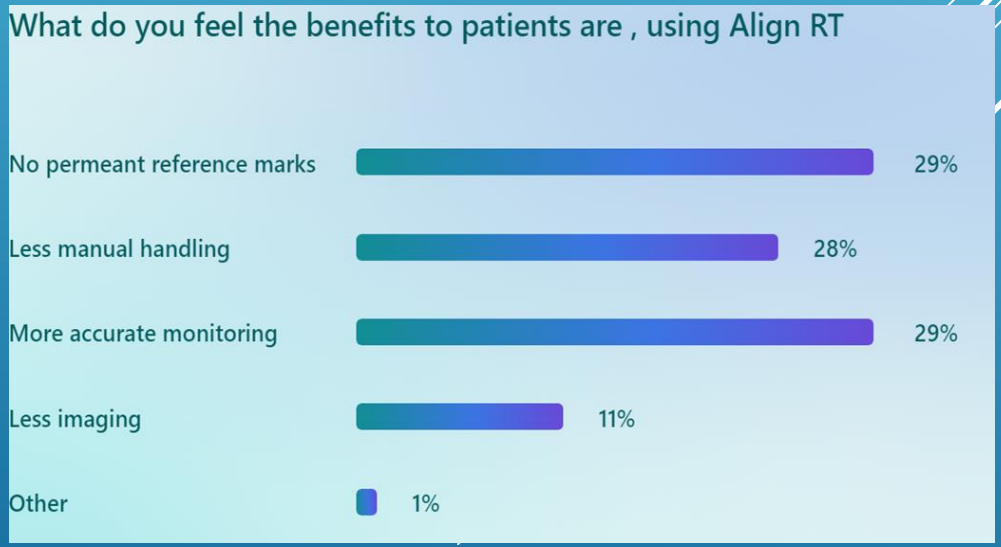


Staff experience survey results









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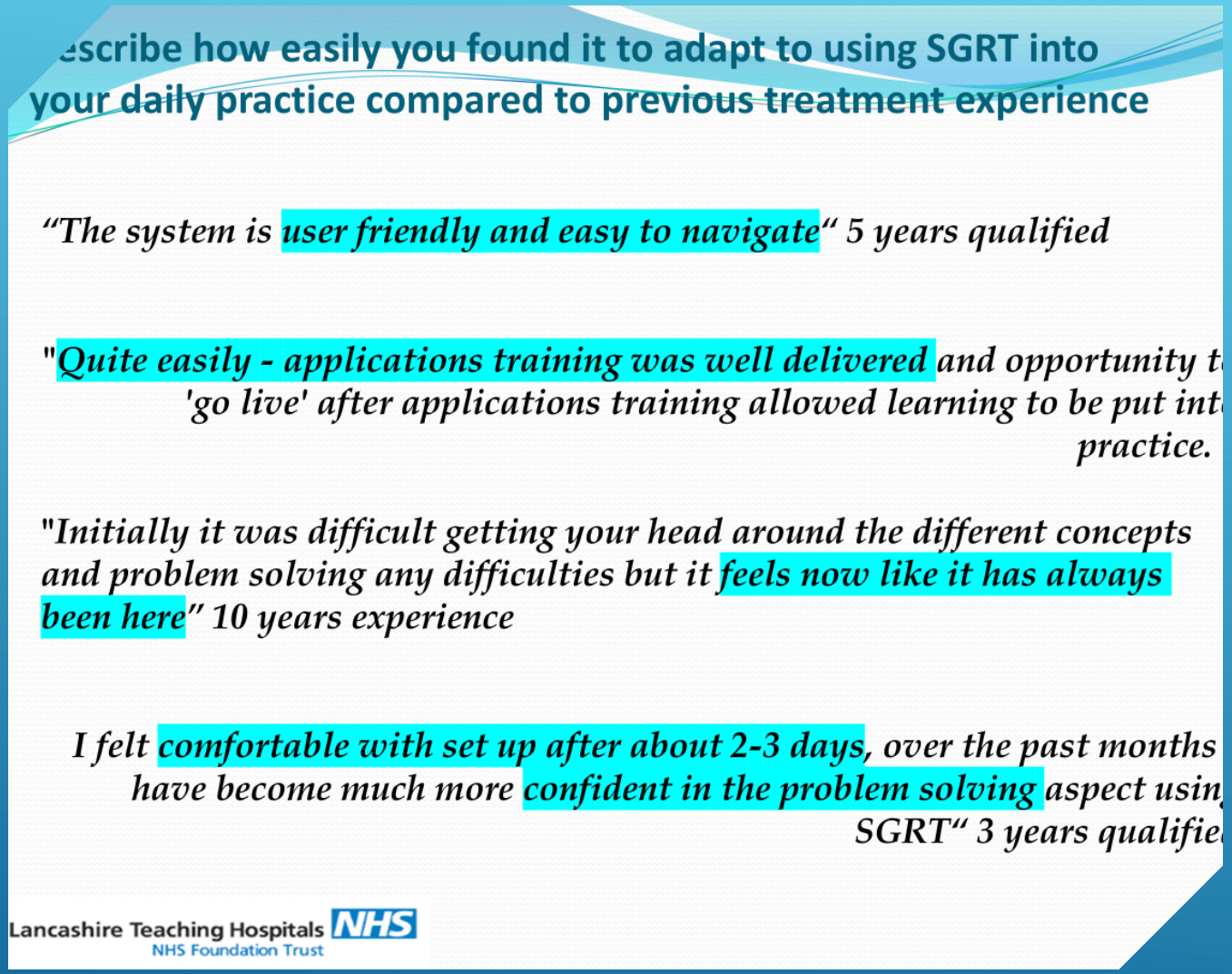
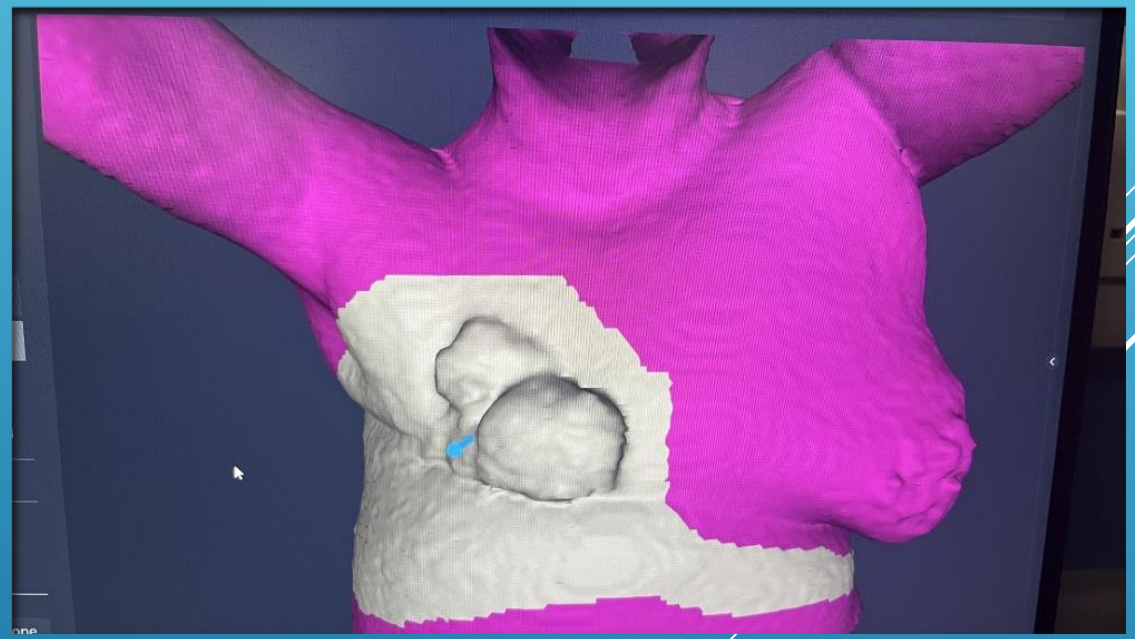


STAFF FEEDBACK

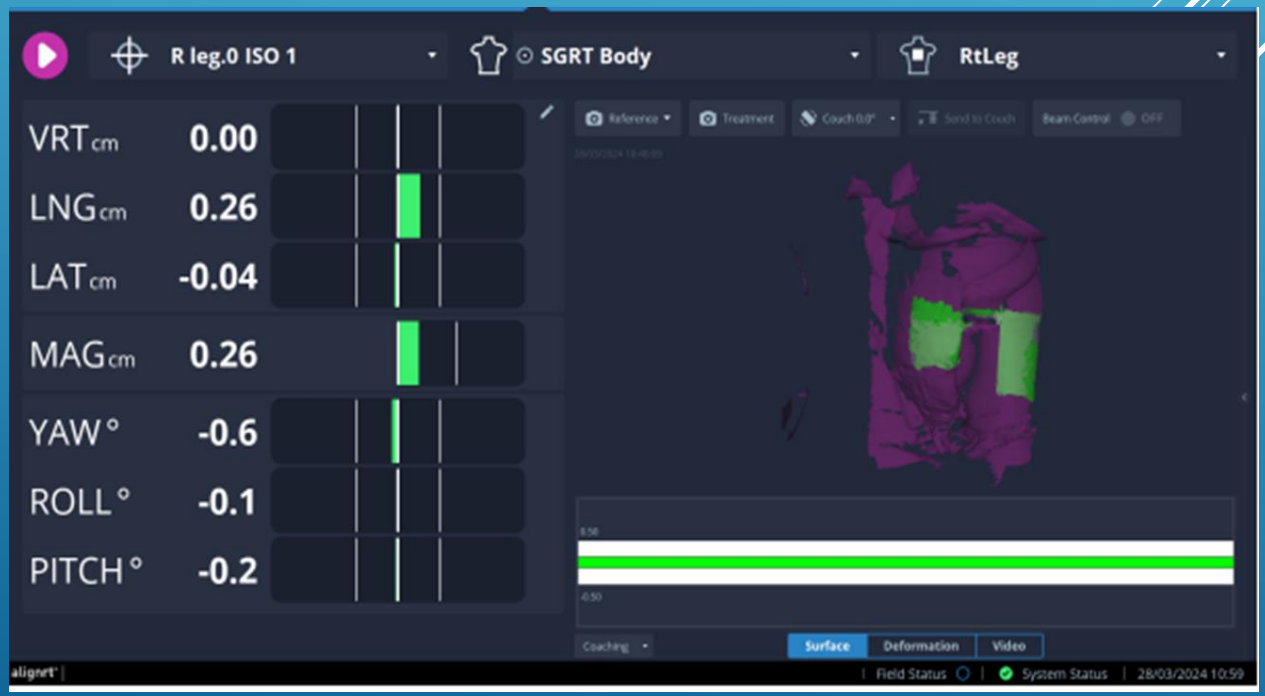
CHALLENGING CASE 1

- 52yo female previous Rt Breast treatment, receiving bilateral breast treatment. 36GY/5# to Lt breast and retreatment to Rt chestwall 8GY/1# palliative intent
- Uncomfortable due to fungating lesion in Rt chestwall and rotated due to large breast on Lt pulling her over slightly
- 1cm bolus
- Pre SGRT would be time consuming to get in correct position leading to longer time on bed, increased discomfort, possible larger displacements and repeat imaging



CHALLENGING CASE 2

- 78 yo female with, extensive sarcoma of the right thigh. 8GY/1# palliative intent
- Right leg amputee, wheelchair bound, limited movement
- Lymphoedema in the right thigh
- Multiple cushions for comfort
- Treated with dressings on and Bolus
- Significant pain
- Pre SGRT would be time consuming to get in correct position leading to longer time on bed, increased pain, possible larger displacement and repeat imaging



LEARNING FROM INITIAL GO LIVE

Learned to adjust ROI from recommended ROI quite quickly for patients that they did not work for ie moving to pelvis ROI for upper L/T spine for rotund patients.

Confidence of the existing trained staff having a good understanding of what the cameras can see and what would be included for difficult set ups added in this

Utilisation of gated capture for some patients even those that weren't thorax

FSD function used more for this cohort to speed up set up.

After first few patients utilised postural video for initial set up as discovered forcing patient into flat and straight position ROI did not match. Used postural video to get into natural position.

Single post field treatments on mattress caused issue with ROI matching at 100 FSD. Testing on phantom showed mattress squash but gave confidence on ROI match representing 100cm to skin accurately.

PROGRESS SO FAR

SABR Thorax- Jan 24	Palliative- Feb 24	Prostate -Jan 25	Bladder- March 25
Markless for prostate and bladder -April 25	Rectum- May 25	DIBH Lymphoma- July 25	Gynae –August 25
	SABR non-spine, bone and lymph node- August 25	Markless for all pelvic patients – Sept 25	

75% of patients are treating using SGRT as the primary set up tool.

NEXT STEPS

Patient trial of open face masks for Brain/SRS

Project looking at open face masks for H&N

Data gathering for SGRT with SABR Liver and SABR Spine

Looking to achieve our goal of being fully SGRT

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ADVANTAGES FOR THE TEAM LEADERS

- Speed of onboarding new staff
- Reduces variation in treatment techniques for same site which reduces training burden
- Single competency
- Developing autonomous practice
- Allowing time to train on other aspects such as imaging.
- Able to rotate staff with manual handling restrictions to ease rota burden.

Key tips for moving forward

LYMPHOMA CURRENT PRACTICE

- Free breathing
- Mask immobilisation
- Conformal plan, AP/PA beam arrangement and 30Gy in 15#
- Daily CBCT absolute correction

BACKGROUND

Clinician led discussions for Mediastinal lymphoma using DIBH started in 2023

Initial plan was to use Elekta ABC(Active Breathing Coordinator)

March 2025 the clinician referred a patient

Due to SGRT experience with DIBH decision made to not use ABC

DEPARTMENT EXPERIENCE WITH DIBH

Non assistenced DIBH introduced for 2 field patients

Elekta ABC system introduced for SABR Liver and SABR Lungs

AlignRT –RTC system introduced along side AlignRT for the expansion of DIBH for all left sided breast patients.

A.B.C SYSTEM

Purchased in 2021

Invasive motion management tool

Time consuming to coach and treat

Reduces capacity

Used infrequently- only 20 Radiographers with competency

Useful for patients with irregular breathing patterns

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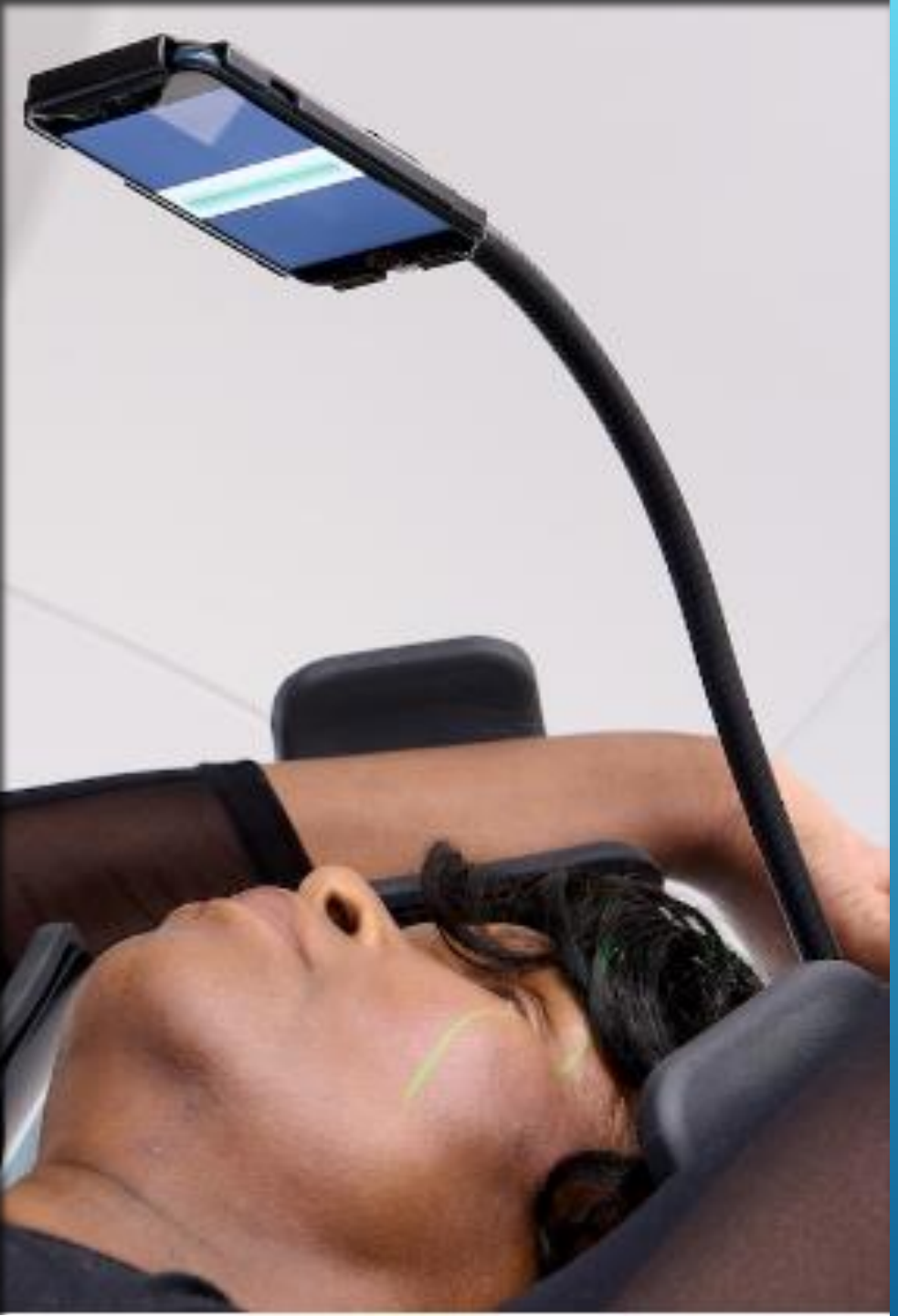


REAL TIME COACH

- Allowed for DIBH to be re introduced post covid
- DIBH to be expanded to all left side breast patients
- Improvement in stats for breast patients
- Adapt use for patients needs

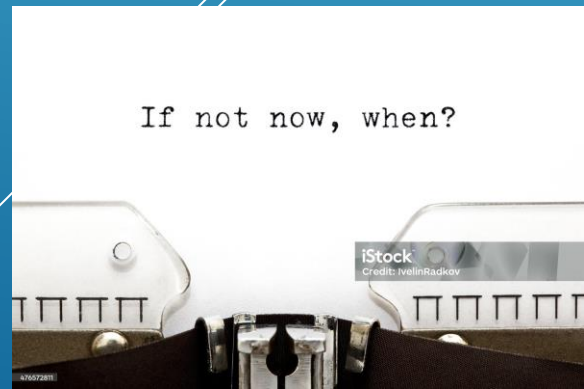
PATIENT CASE STUDY

37 year old male presented with Hodgkin's Lymphoma with mediastinal bulk in the mediastinum together with a node in the left and right side.

Received 4 cycles of chemotherapy

Referred for radiotherapy

Family history of coronary disease



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WHAT DID WE NEED TO DO?

- Decide on appropriate immobilisation for patient
- Compose DIBH instructions, to ensure that patient is ready for CT scan appointment and consistent with other DIBH site
- Produce comprehensive work instruction
- Pre-emptive AlignRT troubleshooting
- Define a suitable ROI- impact of any occlusions
- Assess workflow and image quality

Patient positioned supine on wingboard

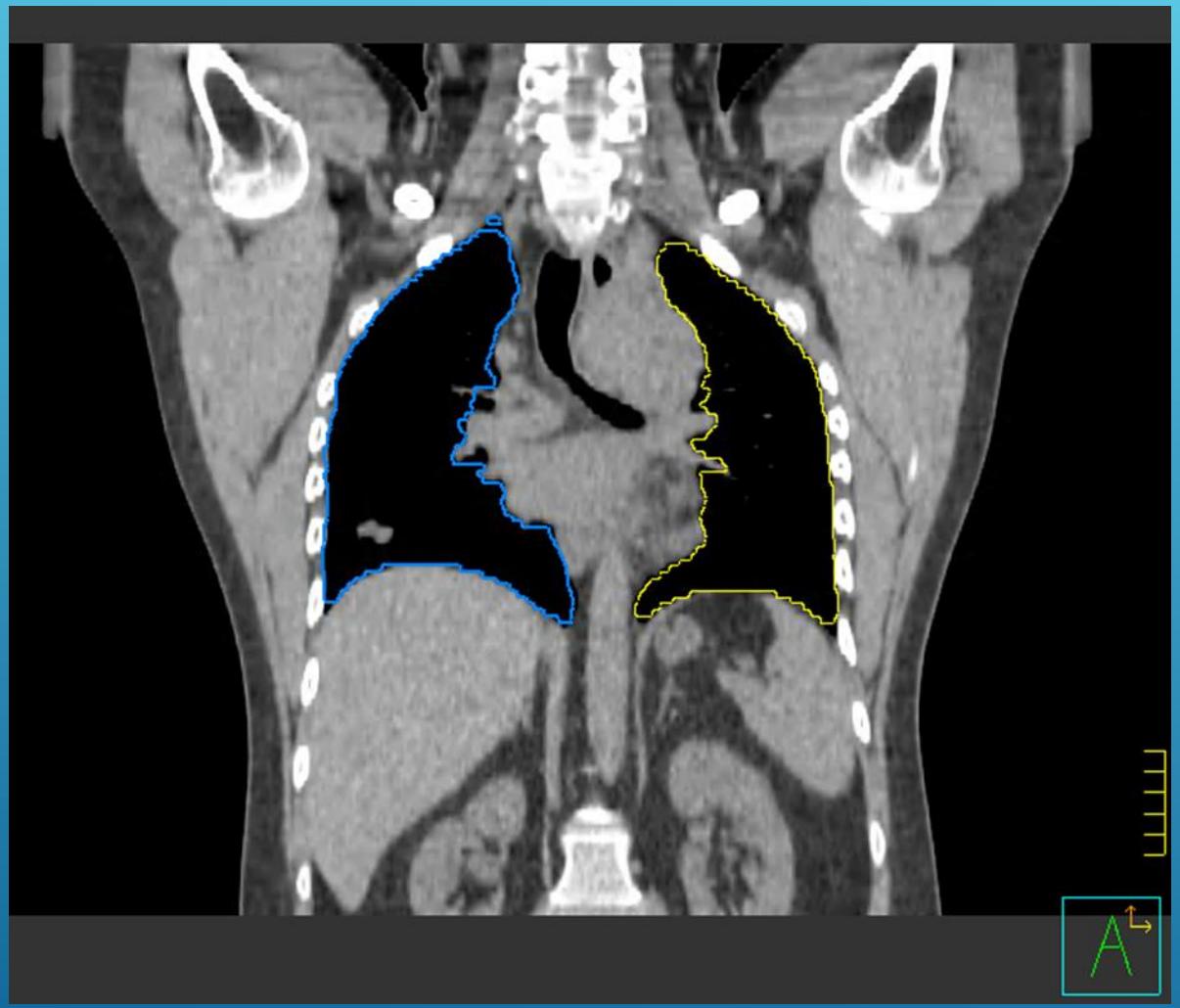
Arms above head

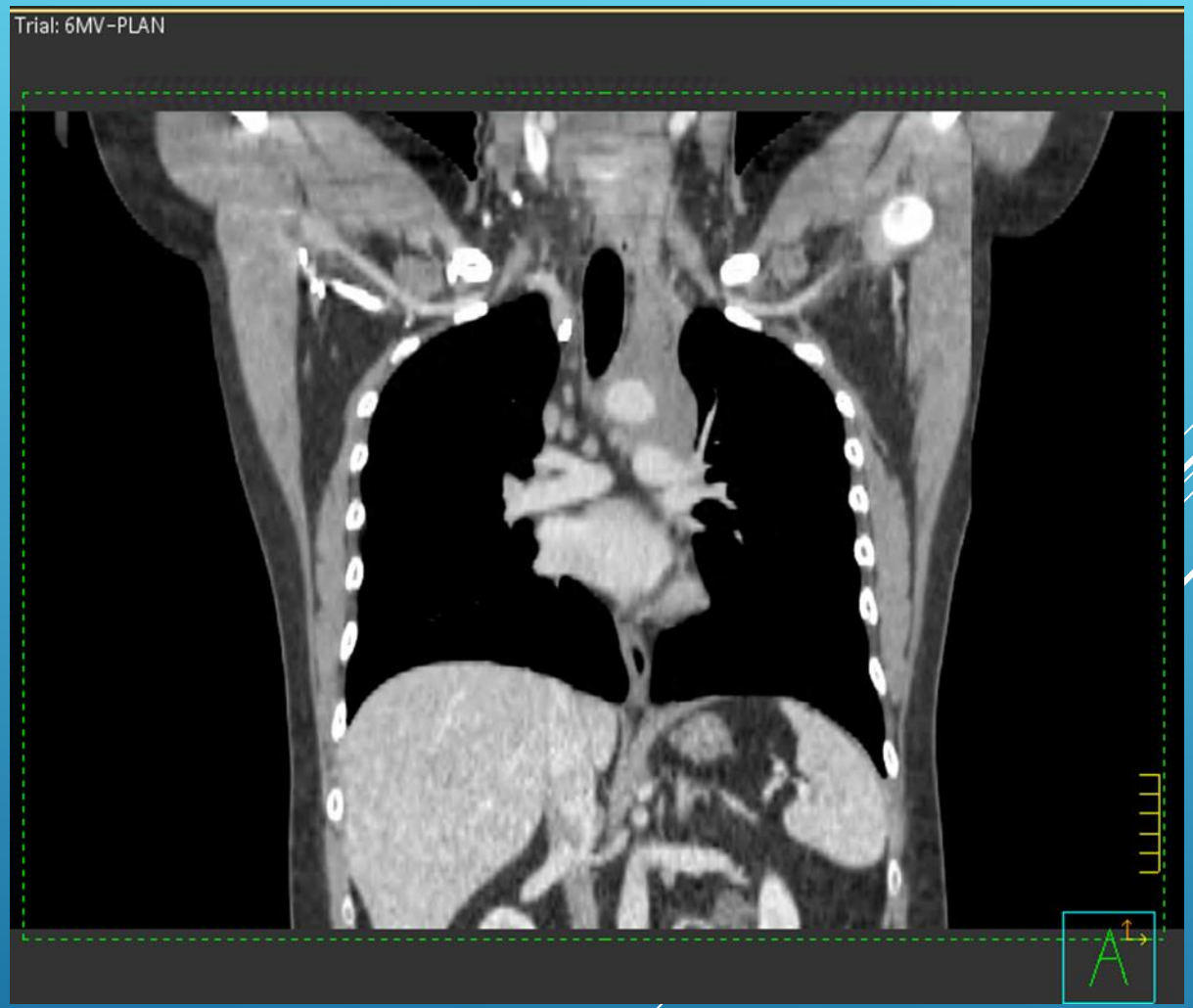
Knee support

Attend CT appointment to check breath hold compliance

Setup amended once treatment started for neuropathy

FREE BREATHING AND BREATH HOLD





Free Breathing – Combined lung volume = 2247cc

Breath hold– Combined lung volume = 4603cc

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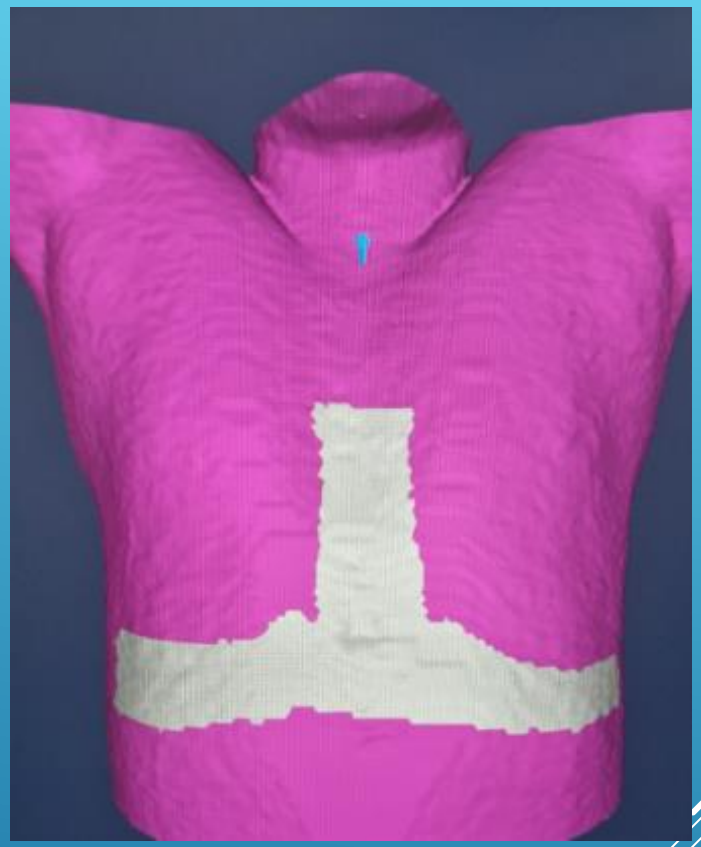
ROI



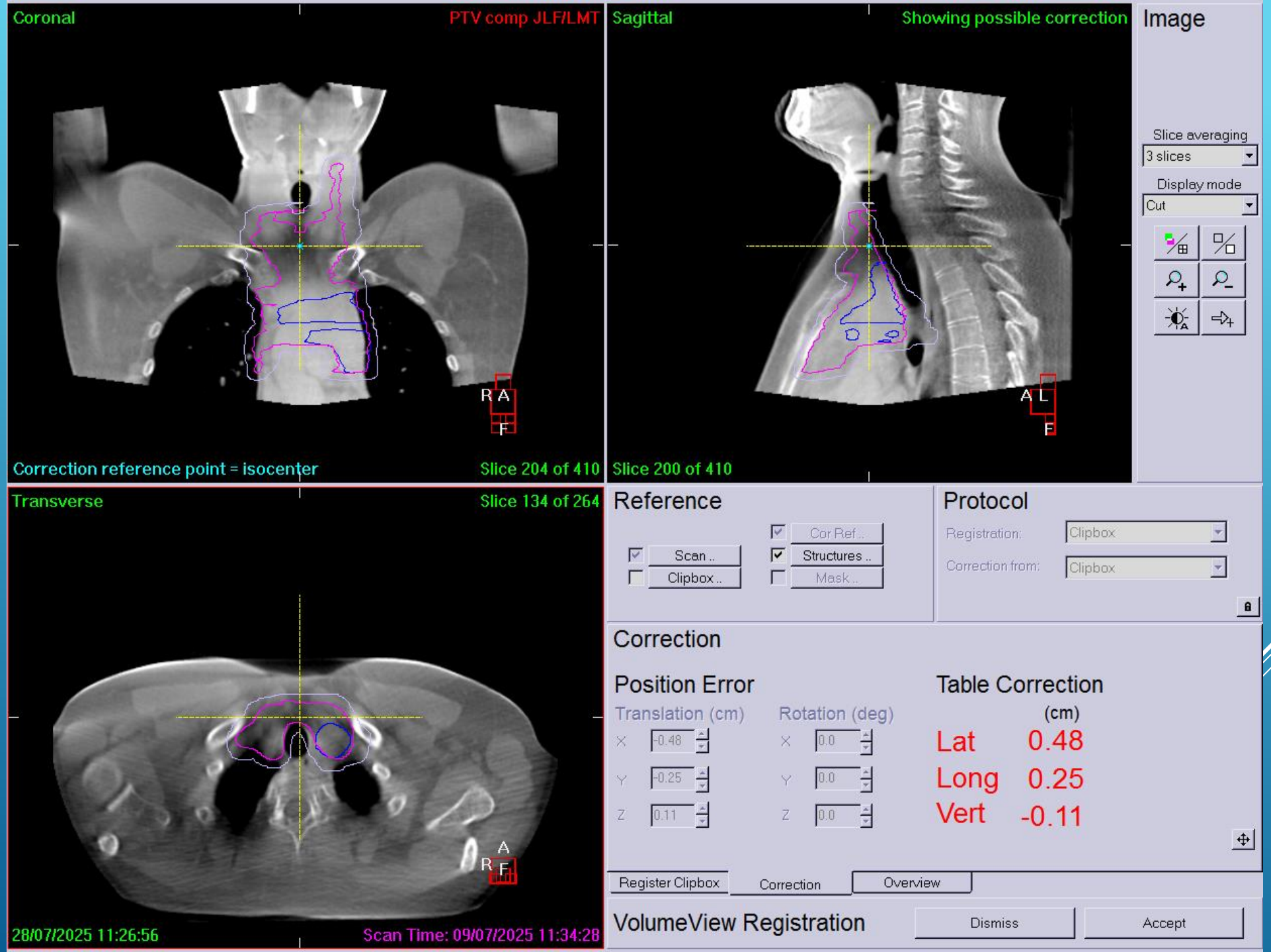
ROI differences were noted on another machine. Blackout areas around the centre of the ROI meant it had to be adapted to allow for treatment to continue.

CBCT AND DISPLACEMENTS

Daily CBCT imaging. Fast acquisition scan, excellent quality

Done in 2 breath holds, with ABC this requires 4 breath holds 20 seconds intervals

	LAT	LONG	VERT
Average displacement	0.7CM	0.1	0


Coronal
PTV comp JLF/LMT
Correction reference point = isocenter
Slice 204 of 410
Sagittal
Showing possible correction
Slice 200 of 410
Image
Slice averaging
3 slices
Display mode
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28/07/2025 11:26:56
Scan Time: 09/07/2025 11:34:28
Reference
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Position Error
Translation (cm)
Rotation (deg)
X -0.48
Y -0.25
Z 0.11
X 0.0
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Table Correction
(cm)
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Register Clipbox
Correction
Overview
VolumeView Registration
Dismiss
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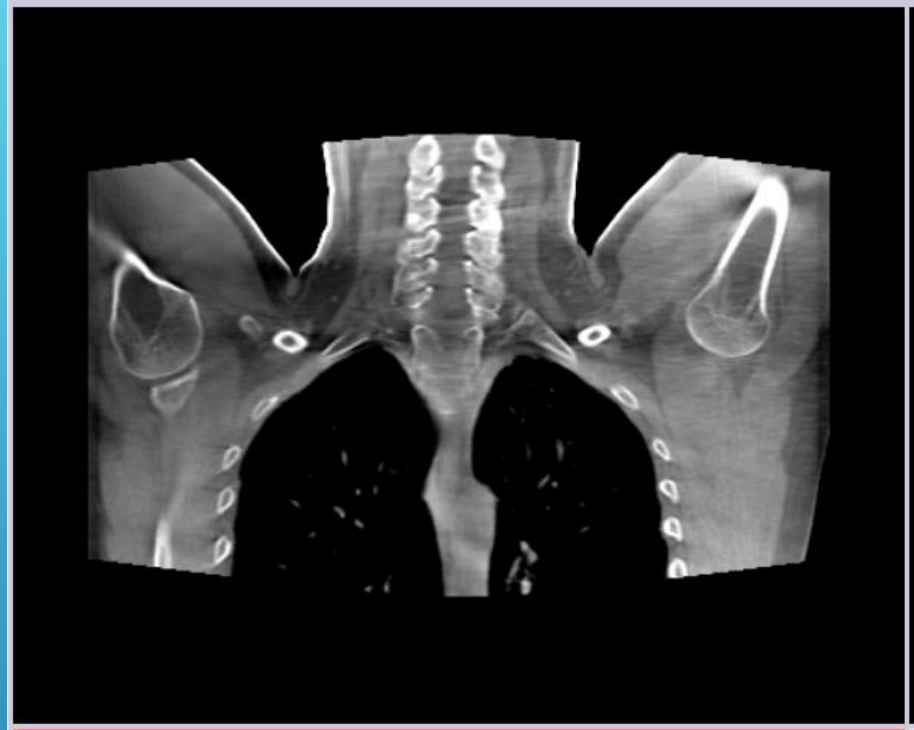
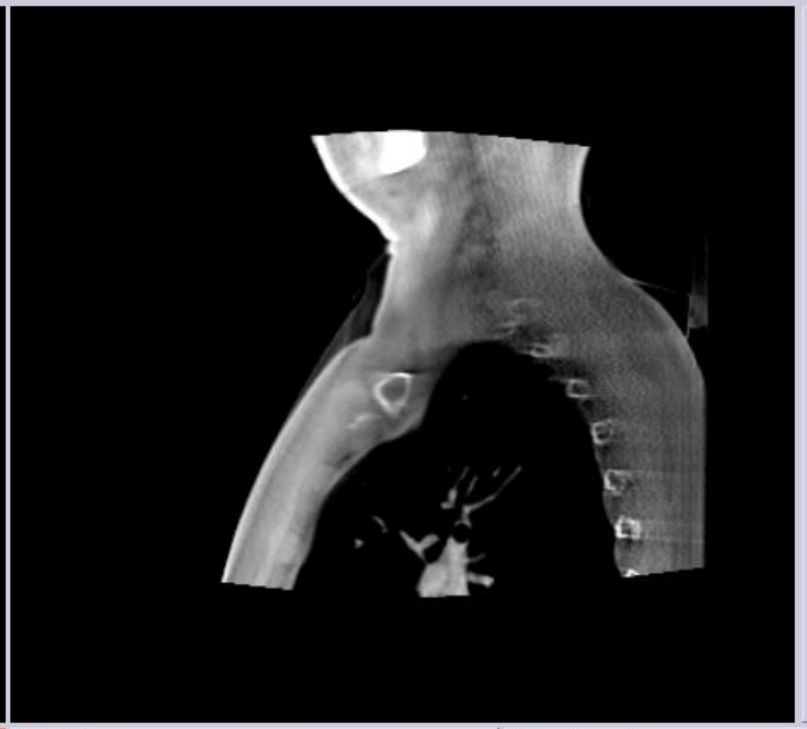




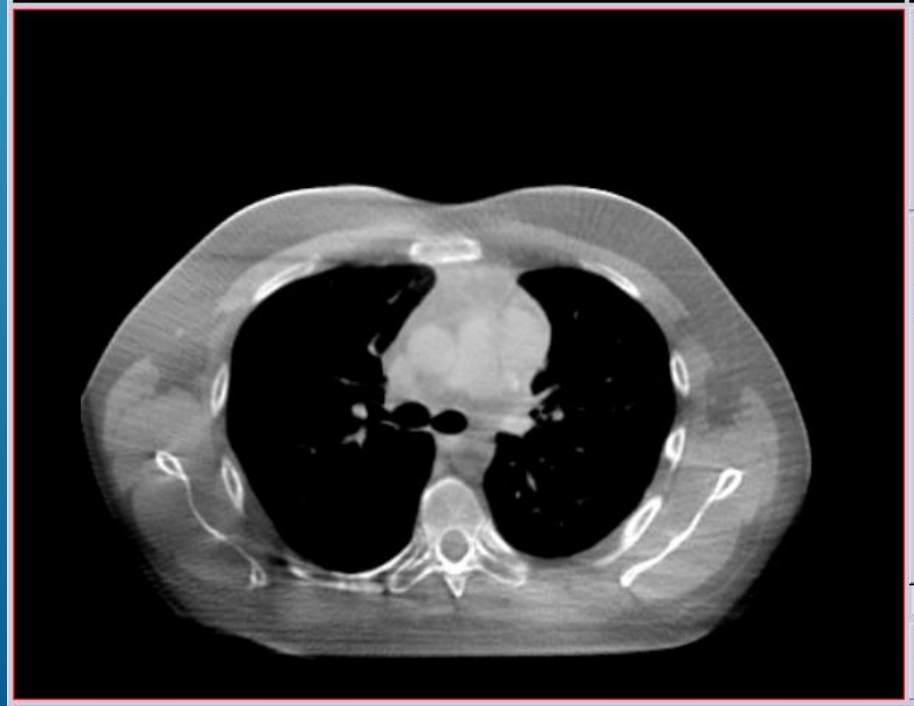
Image

Slice averaging

3 slices

Display mode

Cut



Reference

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Registration: Clipbox

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Correction

Position Error

Translation (cm)

X -0.48

Y -0.25

Z 0.11

Rotation (deg)

X 0.0

Y 0.0

Z 0.0

Table Correction

(cm)

Lat 0.48

Long 0.25

Vert -0.11

Register Clipbox | Correction | Overview

VolumeView Registration

Dismiss | Accept

2ND CASE

- 28 year old male with mediastinal B cell lymphoma
- Had 6 cycles of chemotherapy
- Referred for radiotherapy
- Unable to use SIMRT
- Tried Vacbag for immobilisation for additional arm support
- Had 2 fractions using DIBH with SGRT
- Unable to manage 3rd fraction in breath hold
- Required rescan and replan with free breathing agreed by both patient and clinician

LEARNING FUTURE DEVELOPMENTS

- Standard immobilisation will be wingboard
- SimRT may not pick up the patient breathing trace
- ROI adaptation
- Previous DIBH experience made it easy to get staff signed off
- Expansion of DIBH to other sites

THANK YOU FOR LISTENING AND THANKS TO ALL THE STAFF AT ROSEMERE CANCER CENTRE

For any further information please contact

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