

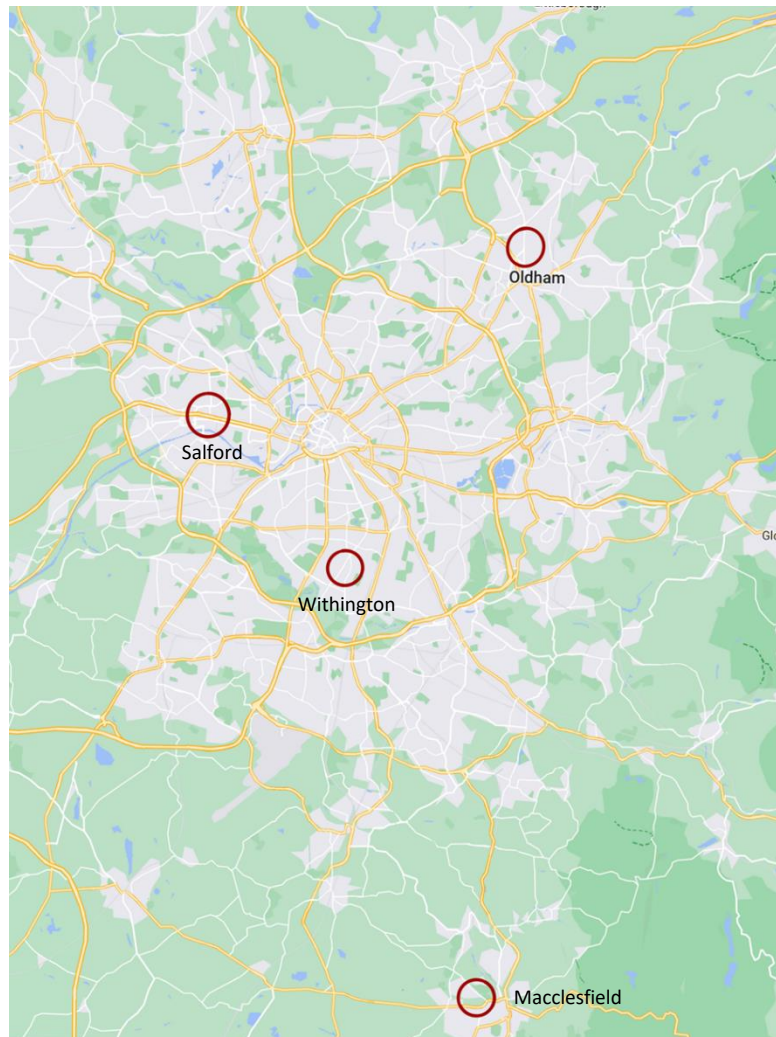
# Clinical Implementation of SGRT for Palliative Patients.

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**The Christie at Oldham**



# The Christie



- Multi-sited, with 4 centres based Withington, Oldham, Salford and Macclesfield  
Catchment area over 100 sq miles.
- Population 3.2 million.
- Satellite centre at Oldham has 2 linacs and treats approximately 18000 fractions per year.



# SGRT at Oldham

- SGRT in use at Oldham since 2021.
- Currently treat all patients having radiotherapy to breast or chest wall using SGRT.
- Keen to utilise the system for positioning other anatomical sites as we can clearly see the advantages.



# Palliative Patients

- Large cohort of patients – Treat approx. 300 palliative patients per year.
- Run a rapid access clinic at Oldham for palliative patients.
- The palliative patient pathway is radiographer-led with remote planning from clinicians therefore no additional training or pressure on other departments to implement.
- This cohort of patients often struggle with remaining still for lengthy periods of time.



# Clinical Validation

- The AlignRT SGRT system has been validated and is routinely used for clinical treatment of patients undergoing radiotherapy to their breast or chest wall.
- This work is to validate a technique using SGRT for VSIM planned palliative treatments.



# Preparation

- Communication link between CT scanner and AQSim planning software to allow export of skin contour structure.
- Decide on appropriate validation.
- SGRT protocols for palliative patients.
- Staff training.
- Documentation.



# Phase 1 – Positioning Only

- Quantify differences between standard positioning and SGRT using imaging placement.
- Single field and parallel opposed VSIM planned patients.
- Position in room using tattoos as standard current procedure using SGRT to document difference in set up position.
- Image verify and compare required moves to SGRT placement.



# Phase 1 results

- Data Gathered from both parallel opposed pair and single field treatments.
- Mean difference between SGRT deltas and 2DKV image correction 0.2cm.
- Accurate set up using SGRT compared to current workflow.
- There was a reduction in repeat imaging due to improved accuracy.
- Learning from this phase: Training was required to ensure adequate ROI placement as less prescriptive than placement for breast pts.





# Imaging

- When treating using standard workflow data showed 20% of images were found to be out of tolerance thus requiring repeat images. (Table 1)

	In tol	OOT
Patient	Image Displacement	
	S/I	L/R
1	0.1	-0.4
2	-0.1	-0.2
3	0	0
4	0	0.1
5	-0.5	0
6	-0.3	-0.3
7	0.4	0.6
	-0.7	1.3
	0.6	0.8
	0.9	0.8
8	0.4	0.5
	0.2	0.8
9	0.2	-0.6
10	0.3	1.3
11	0	0
12	0	-0.1
13	0.1	-0.2
14	-0.1	-0.4
15	0	-0.1
16	1.5	-0.3

**Table 1**



# Reduction in Imaging

Data collated when using SGRT to position the patient found only 5% of the images were OOT. (Table 2 + 3)

POP		
Patient	In tol	OOT
	EPI	
	S/I	L/R
1	-0.5	-0.1
2	0.1	-0.3
3		
4		
5	0.02	0.06
6		
7	0.3	0
8		
9		
10	0.5	0.3
11	0	0
12	0	0
13	-0.2	0

*Table 2*

SINGLE FIELD		
Patient ID	In tol	OOT
	EPI	
	S/I	L/R
1	0.1	0.1
2	0	0
3	1.4	0.2
4	0.7	0
5	0.2	0.9
6	0	0.1
7	-0.2	-0.2
8	0.2	0
9	0	0
10	0	0

*Table 3*



# Phase 2 – Positioning and Monitoring

- Quantify treatment interruptions to establish appropriate gating thresholds.
- Data gathered from more VSIM planned patients.
- Position in room using SGRT and verify using KV imaging.
- Real time monitoring for patient position during treatment without gating.



# Phase 2 Results

- Of the 24 treatments in this phase only 3 required adjustments of more than 0.5cm to ensure they were treated at mid-plane (12.5%).
- 8 of the treatments would have gated but returned to within tolerance without requiring intervention.
- Rotational deltas set at 3°.
- 0.5cm is deemed an acceptable threshold.



# Phase 3 – Positioning and Gating

- Evaluation of treatment interruptions in order to inform acceptable thresholds for gating activation.
- Patients positioned in room using SGRT with the addition of gated treatment and correction to verified treatment position if necessary.



# Phase 3 Results

- No treatments required re-set up mid treatment due to motion.
- Staff much more confident with workflow and finalised work instructions.
- Due to more confidence started to notice time saving benefits.



# Time Saving Benefits

- Retrospectively compared in room time recorded on Mosaik for treatments using the standard workflow and compared the same parameters using the SGRT workflow.
- Average time saved approximately 10 minutes per treatment.

SF	
Technique	Average Time
Tattoos	26.4
SGRT	14.8

POP	
Technique	Average Time
Tattoos	26.4
SGRT	17.2



# Learning

- Staff training.
- ROI placement.
- Improved accuracy due to real time monitoring.
- Faster treatment times.
- Validation useful to streamline workflow, roll out staff training and increase confidence in new way of working.





# Moving forward

- SGRT as standard workflow for VSIM planned palliative treatments at Christie Oldham.
- Expand workflow to further treatment sites.



# Acknowledgements

- Thanks to all disciplines across The Christie who have contributed so much to ensure SGRT is operational and benefiting patients.
- Special thanks to the Christie at Oldham team for their support in data gathering and their willingness to embrace new ways of working!

