SGRT for Paediatric TBE

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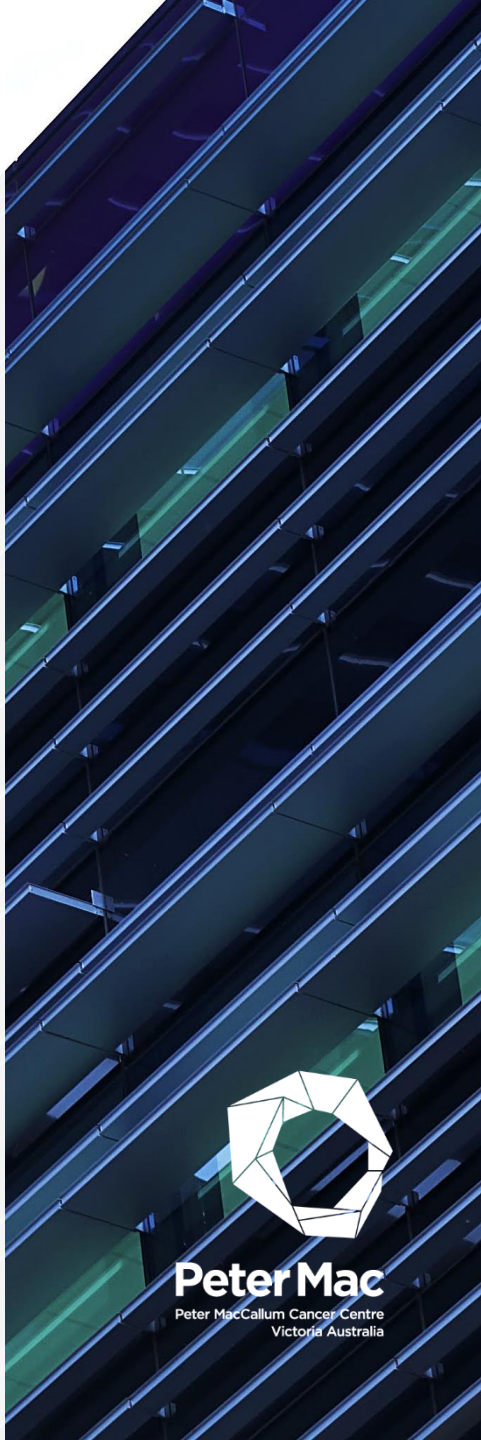

01

PAEDIATRIC RT AT PETER MAC

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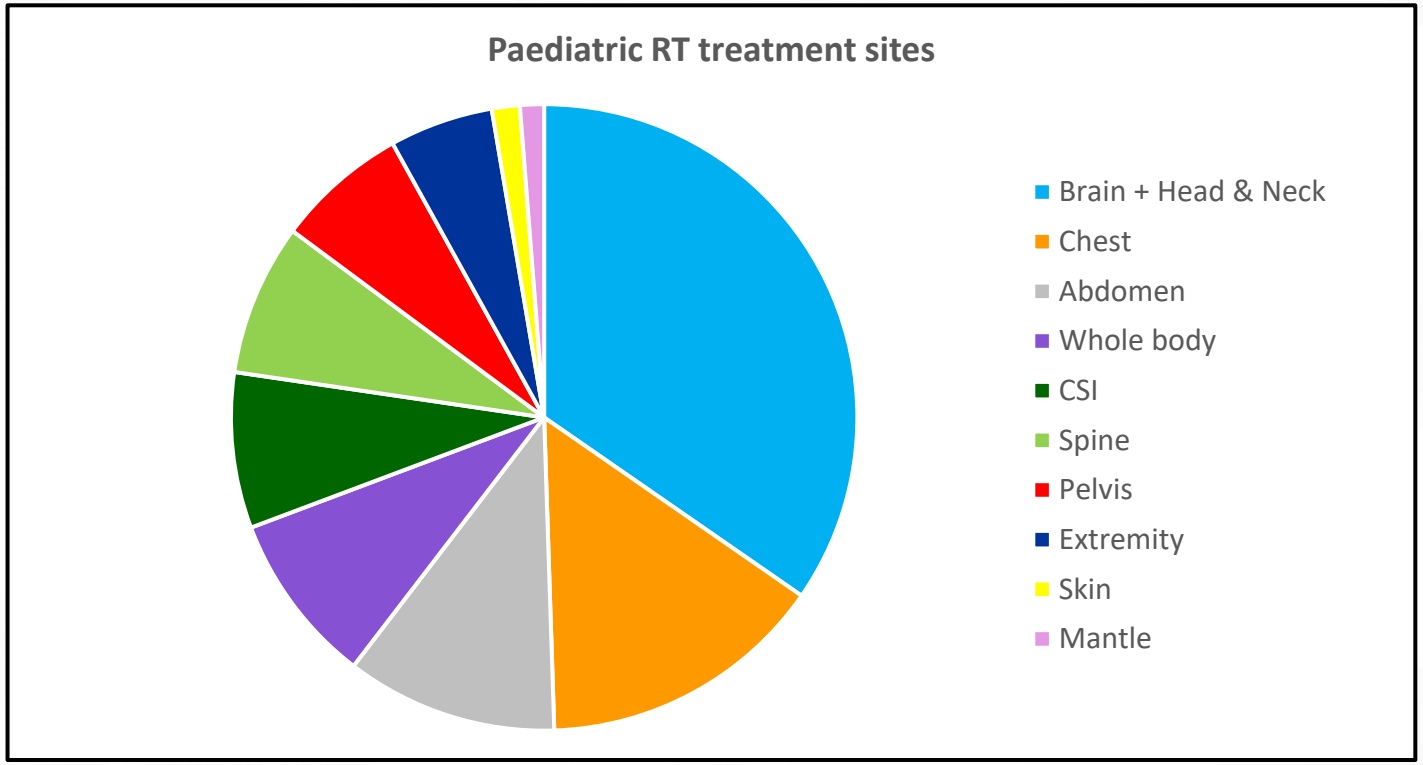
- 70-100 patients per year
- Ages 0-17
- Treatment sites include brain/H&N, Extremity, CSI, chest, abdomen, spine



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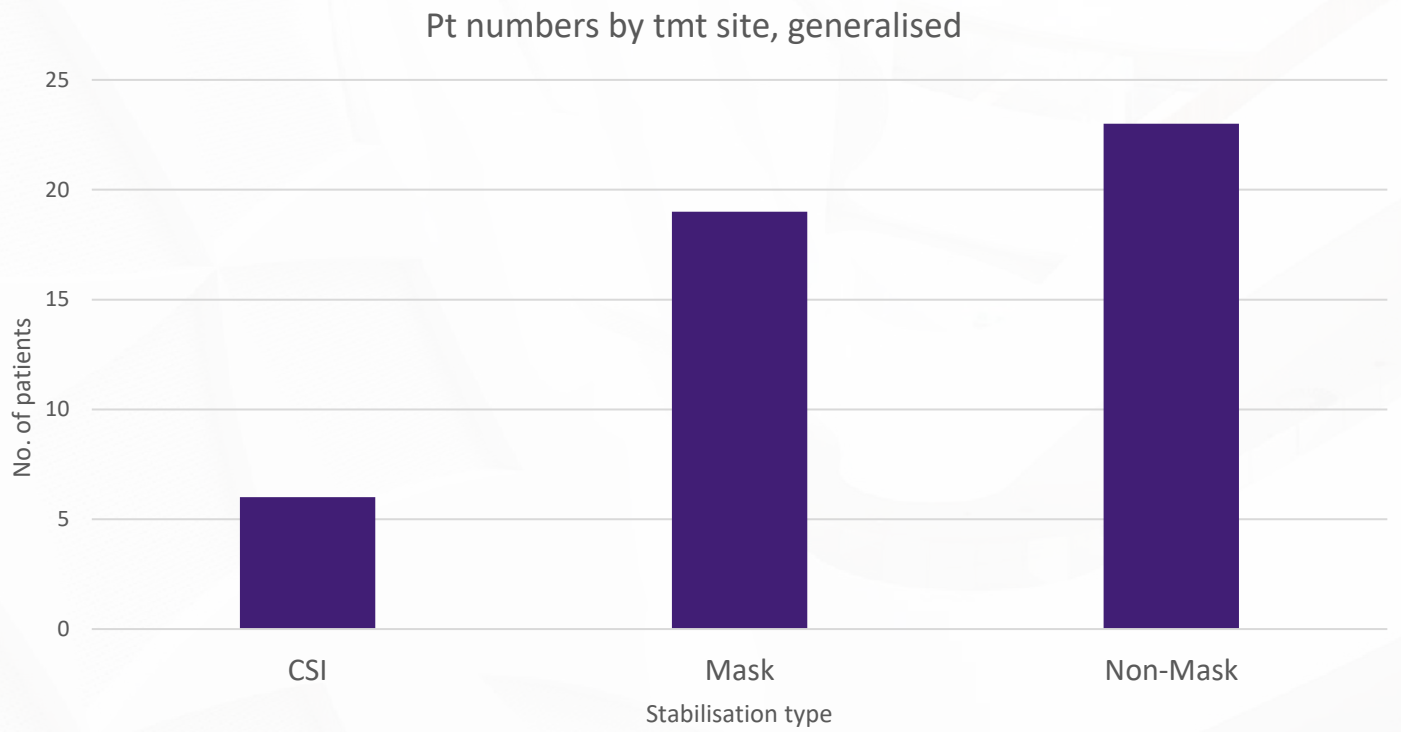

PAEDIATRIC RT AT PETER MAC

- Reductions in setup time and IGRT time for all sites
- Significant for CSI

Mean treatment time for SGRT and non-SGRT cases

	Mask			Non Mask			CSI		
	SGRT- (mins)	SGRT+ (mins)	Δ (mins)	SGRT- (mins)	SGRT+ (mins)	Δ (mins)	SGRT- (mins)	SGRT+ (mins)	Δ (mins)
Setup time	03:04	02:20	-00:44	07:13	03:26	-03:47	08:00	06:28	-01:32
IGRT time	01:54	01:19	-00:35	02:15	02:05	-00:10	11:59	05:05	-06:54
Tmt time	02:51	03:41	+00:50	03:02	03:23	+00:21	23:26	19:17	-04:09
Total time	08:41	07:15	-00:29	15:05	09:55	-03:36	43:25	30:50	-12:35

SGRT- = No SGRT used SGRT+ = SGRT used

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Victoria Australia

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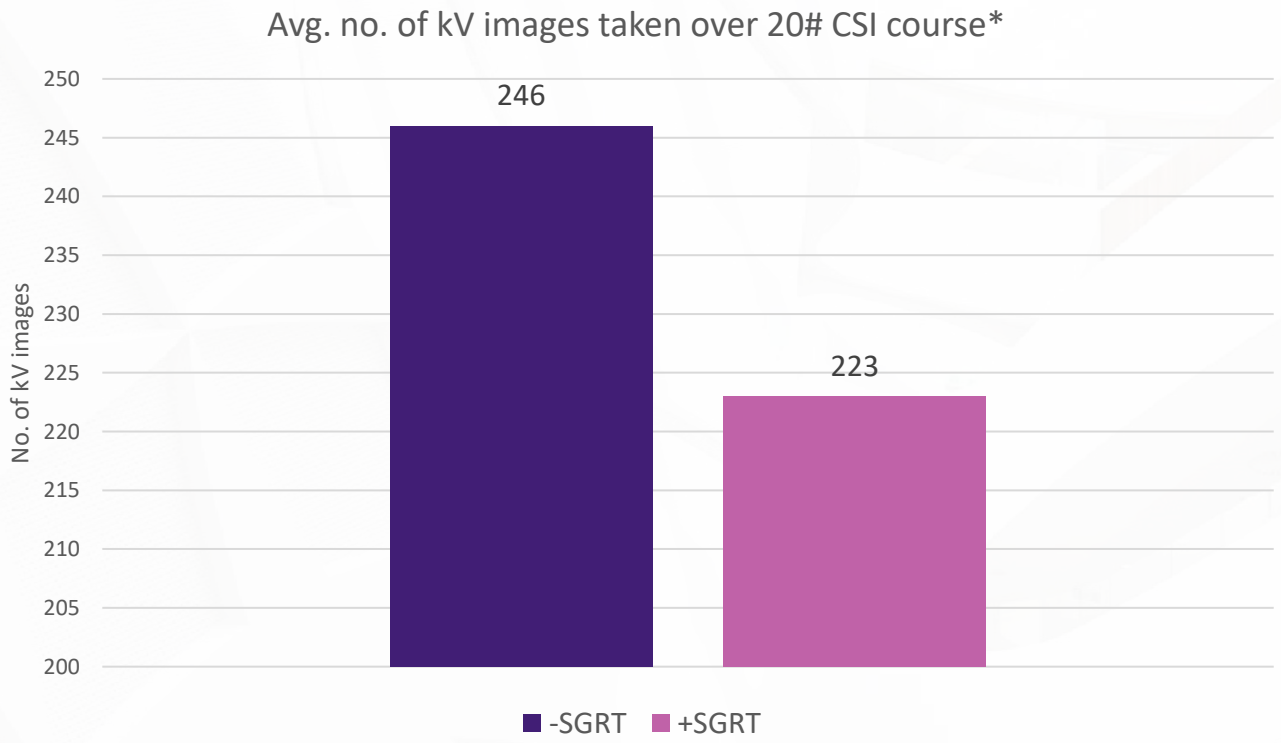
PAEDIATRIC RT AT PETER MAC

- Improvements to setup accuracy – reduction in repeat imaging



02

PAEDIATRIC TBE CASE STUDY

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PAEDIATRIC TBE

HISTORY

- 4-month-old
- Relapsed acute myeloid leukaemia with cutaneous deposits
- GA required
- TBE planned for 15Gy/10#
- Photon “rind” planned for lateral edges of thorax where electrons do not penetrate deep enough
- 9Gy/9# boost to cutaneous disease

CONVENTIONAL TBE

- Patient standing on turntable
- Gantry @ 270˚
- 300cm SSD
- Large open electron fields with higher dose rate
- Boosts to axillas, soles of feet, palms of hands, inner thighs

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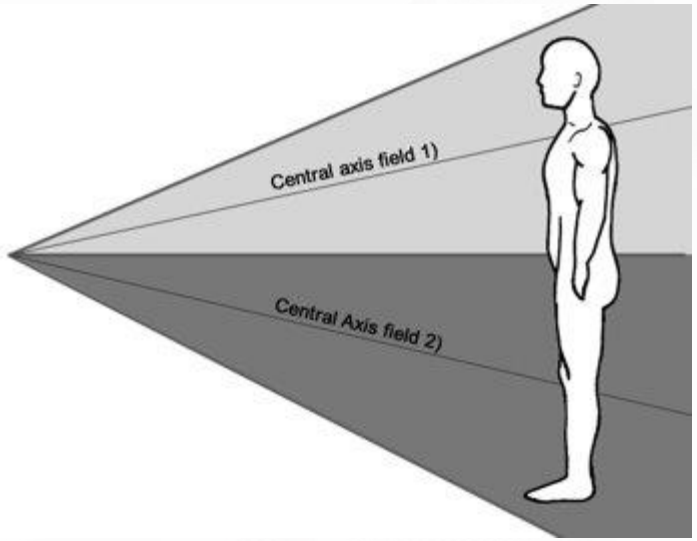

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TREATMENT POSITION

- Supine
- Arms by side slightly akimbo
- Legs frog-legged
- Vacbag under whole body

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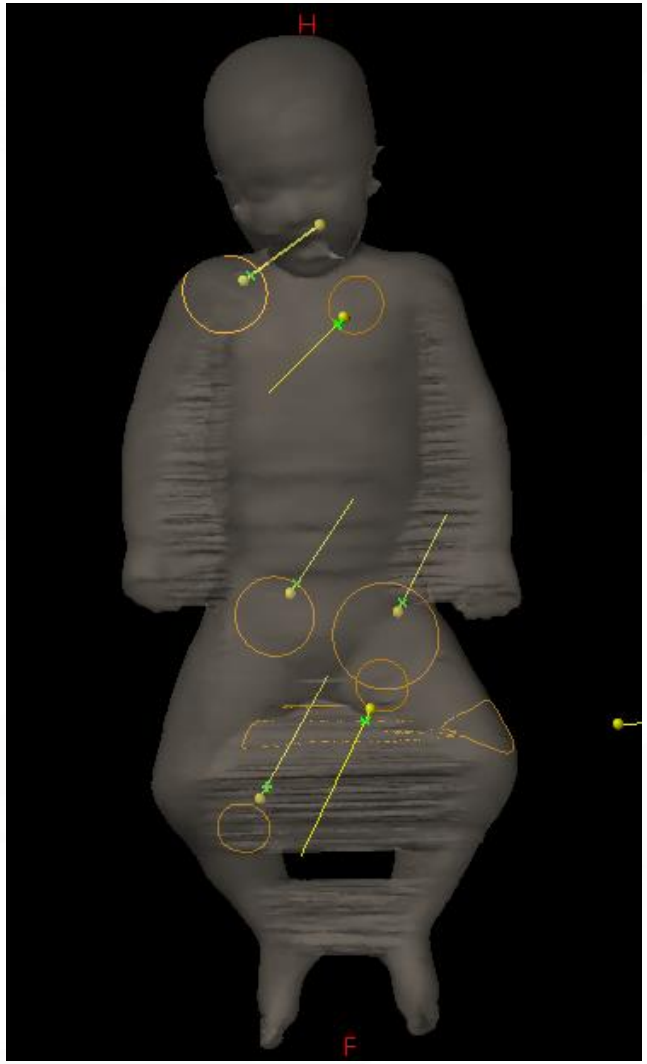
TREATMENT PARAMETERS – CUTANEOUS BOOST

- 7 sites (buttocks x2, calf, shoulder, chest, knee,thigh) , each single electron field + BU

- Whole body positioning less crucial, however alignrt still necessary to position each site



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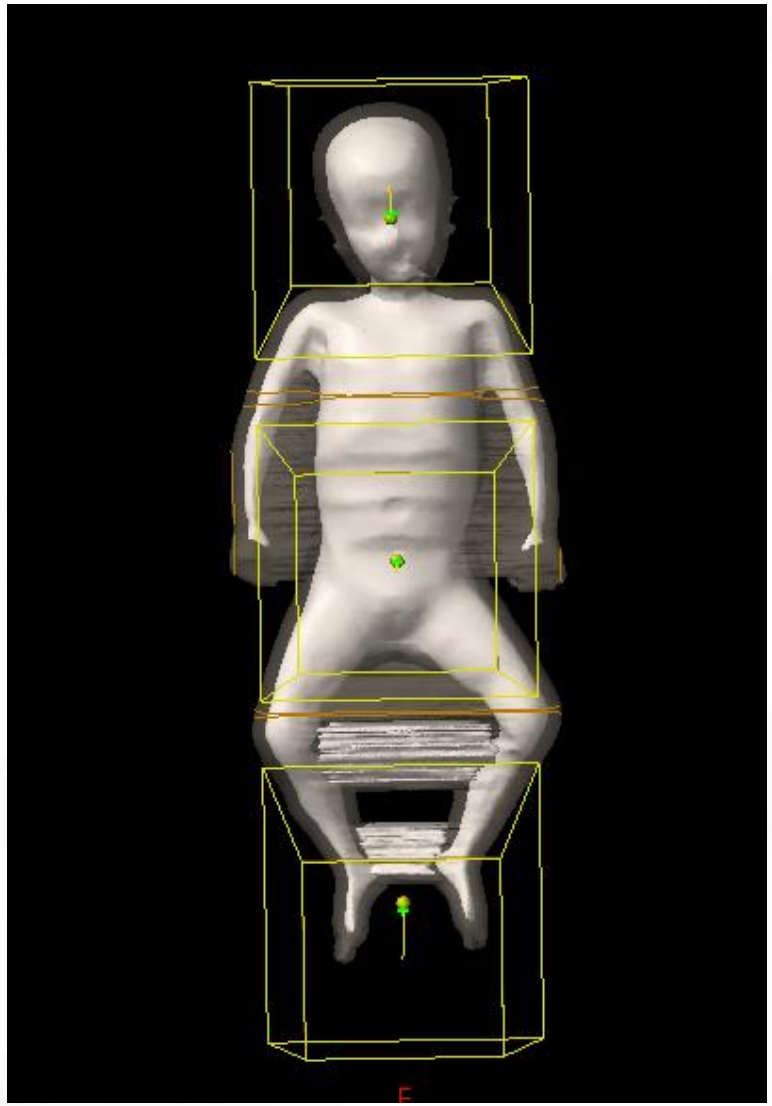
TREATMENT PARAMETERS – TBE

- Junctional superior, mid and inferior open electron fields – anterior and posterior
- 0.8cm perspex sheet (constructed as table) to cover anterior fields
- Planned for bilateral axilla boosts (photons)
- Whole patient position crucial to ensure appropriate junctions/shielding



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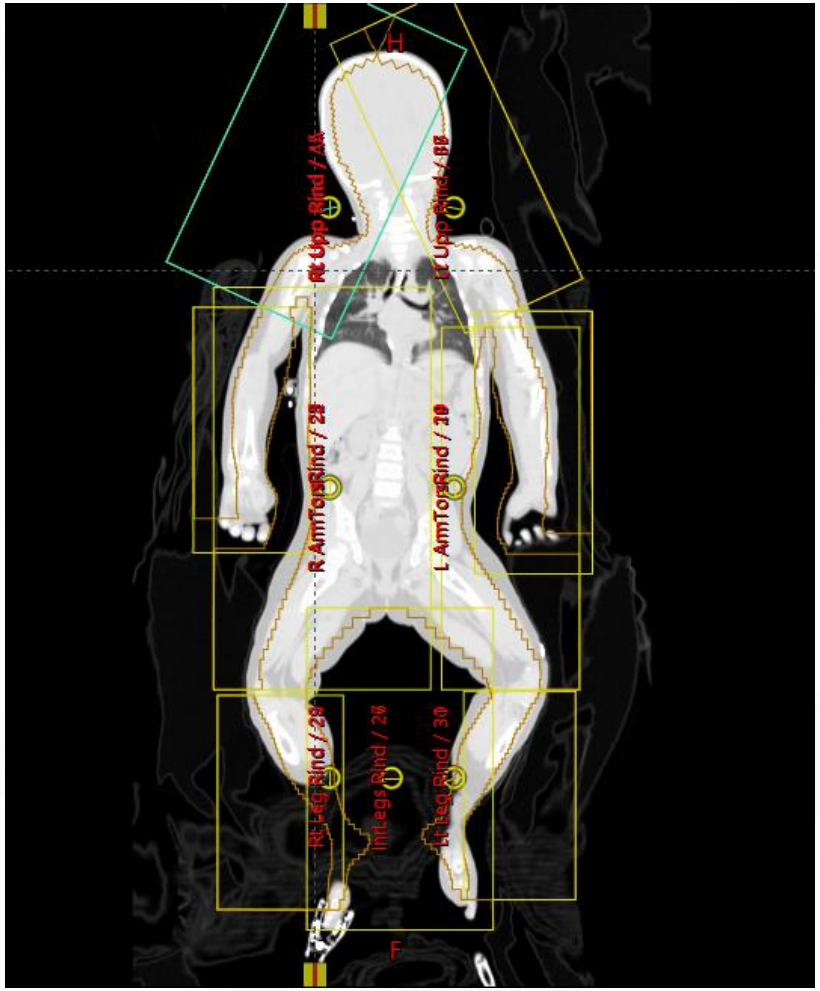
TREATMENT PARAMETERS – TBE “RIND” PHOTONS

- Whole patient position crucial to ensure appropriate junctions/shielding
- Mask could not be used, AlignRT crucial for head position to ensure avoiding brain (confirmed with kv imaging)



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TREATMENT PARAMETERS – TBE

3D print of the patient used for mockup to confirm:

- AlignRT FOV
- Clearance issues
- Perspex table coverage
- Workflow steps
- BU of stabilisation equipment and couch top

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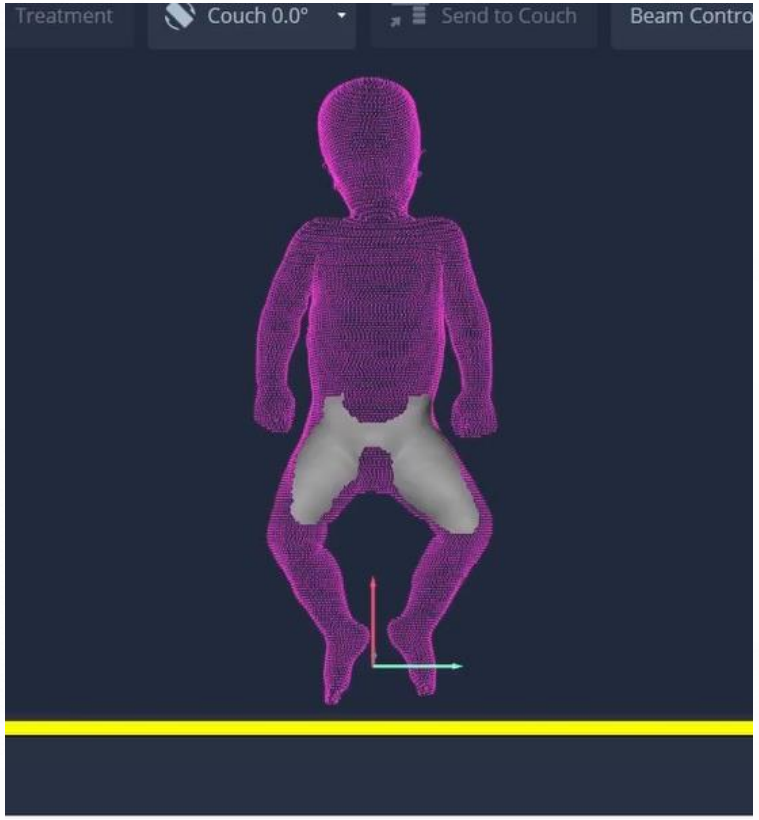
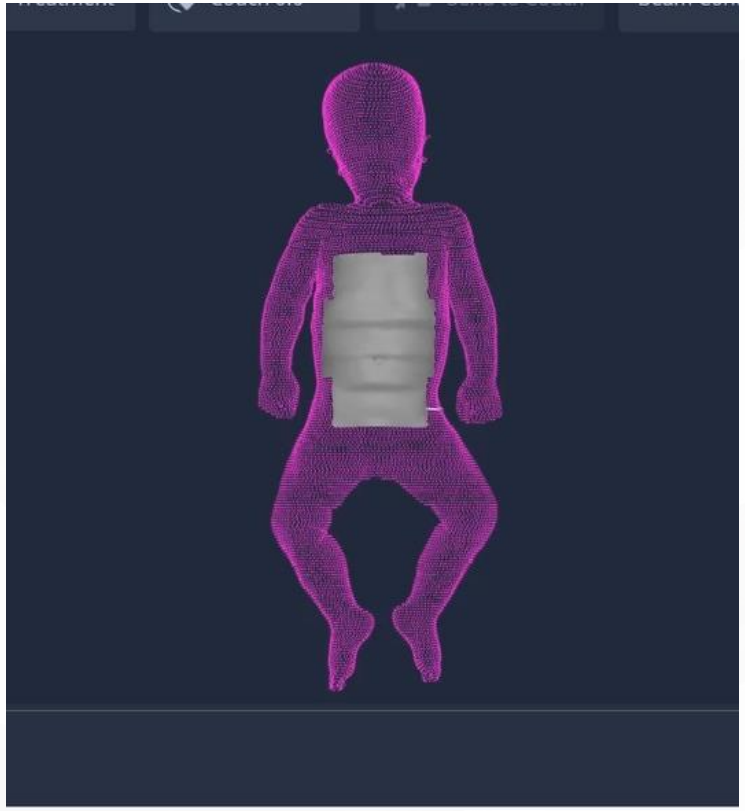
TREATMENT

- AlignRT used for setup only
- ROIs setup for each region for passive monitoring but highly reliant on postural video





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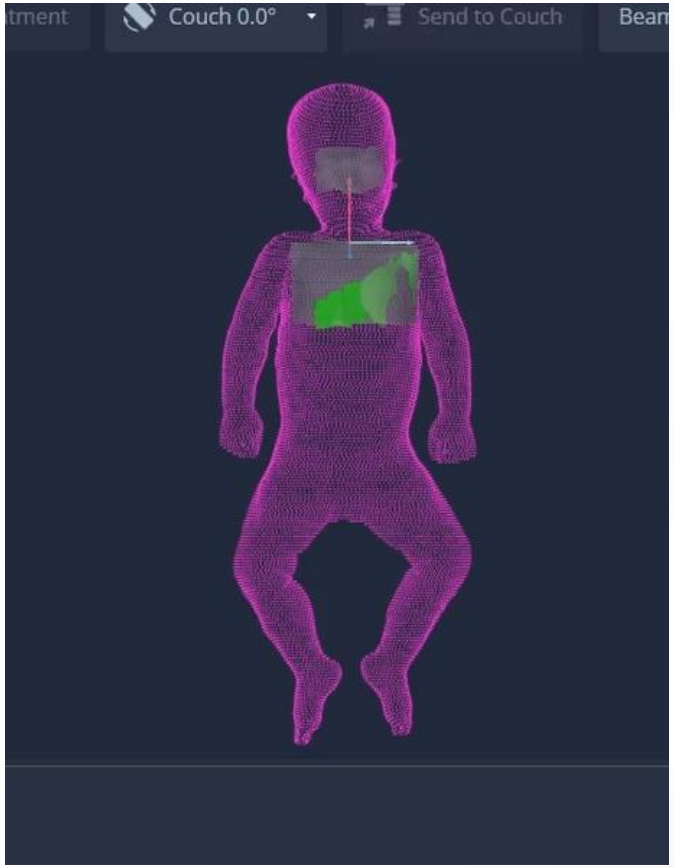

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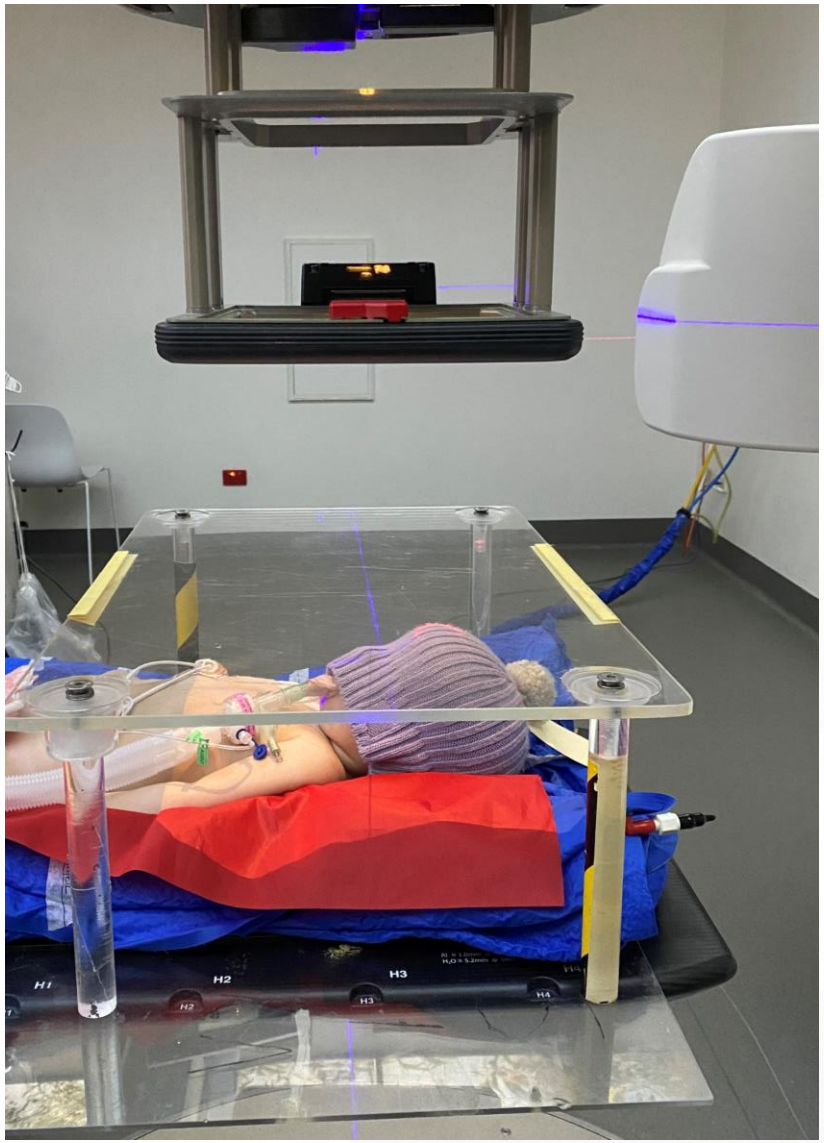
TREATMENT

Perspex table in place for superior-anterior TBE field



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TREATMENT

- TLD results indicated acceptable doses in key areas (except where eclipse had poorly modelled electron doses – ‘TBE rind’ photon boosts no longer necessary)
- Treatment delivered appropriately
- Boost treatments approx. 1hr total
- TBE treatments approx. 40mins total
- Pt has had good response to treatment

SUMMARY

- AlignRT crucial for the accurate positioning of this patient
- Treatment would not have been possible with the same level of efficiency and accuracy without
- SGRT has uses beyond the standard and can provide benefits where we don't expect

THANK YOU

Questions?

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