

A regional scoping study of Radiographer educational requirements and clinical service need in relation to adaptive radiotherapy techniques

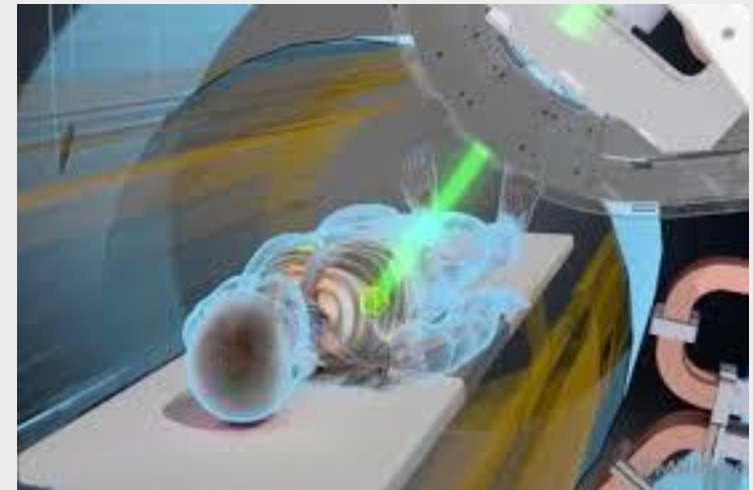
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What is Adaptive Radiotherapy (ART)

‘Changing the radiotherapy (RT) plan delivered to a patient during a course of RT to account for temporal changes in anatomy or changes in tumour biology/function’

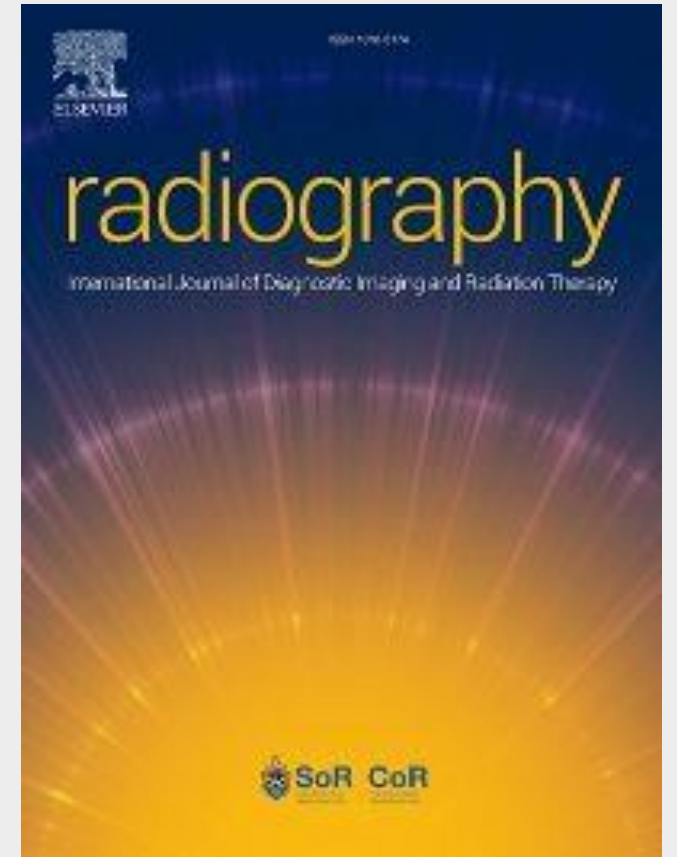
(Yan et al, 1997)

- State-of-the-art technology can deliver on-line ART (oART) in real-time at the point of treatment to deliver truly personalised care (Dona Lemus et al, 2024)
- Clinical benefits of ART: target volume margin reduction and normal tissue sparing has been highlighted (Lui et al., 2023)



Background

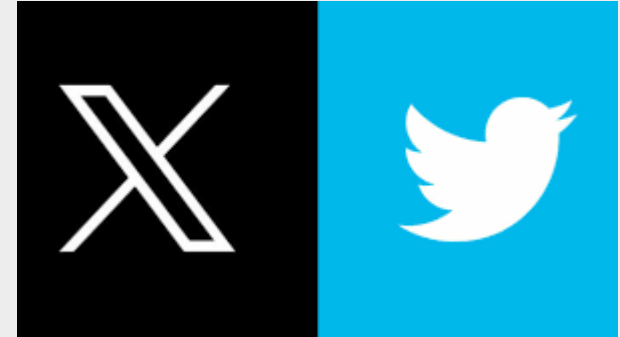
- PI: HEI and Technical Lead Role at NHS RT centre
- Regional projects looking at technical implementation of oART and workforce development
- Submitted for publication



Methods

A mixed methods study was conducted consisting of:

- A literature review of peer-reviewed papers
- An on-line survey was designed and distributed to Radiographers across the region
- Semi-structured interviews were conducted with Radiographer Education and Service Lead volunteers
- A focus group was conducted with Radiographer volunteers.
- Full verbatim was independently transcribed and analysed thematically and triangulated with quantitative results



Conducted sequentially

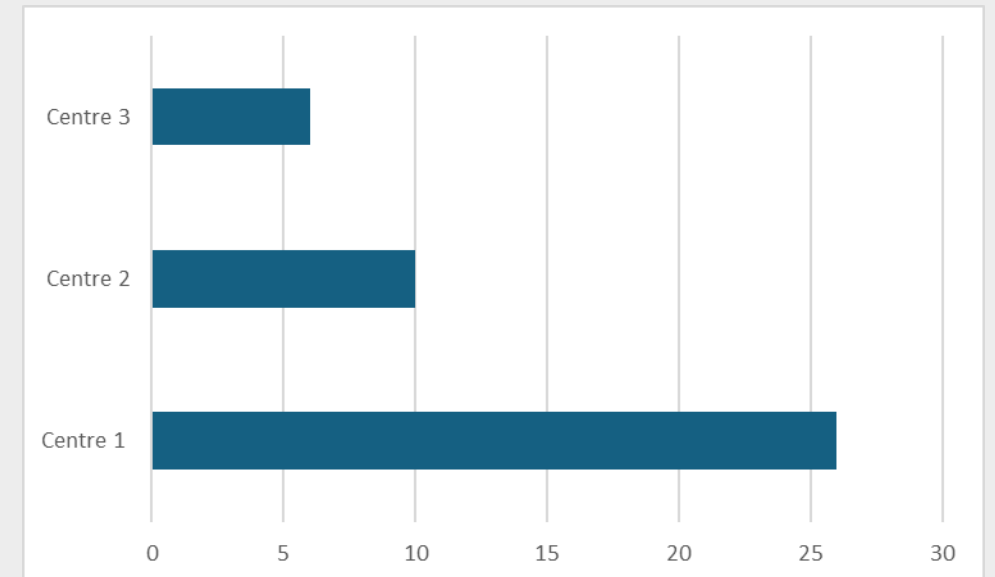
Results 1- literature review

Authors	Origin	Research Design	Size	Major themes
Adair Smith et al. (2023)	UK	Dice similarity between Doctor and Radiographer contouring	117 contoured images	High inter-professional similarity, all plan clinically acceptable.
Hales et al. (2021)	UK	Report on single centre experience	1 RT centre	Skills acquired through varied educational methods such as tutorials, workshops, self-directed learning, and interdisciplinary boot camps. Led to efficient, Radiographer led workflow.
Hilder et al. (2021)	Australia	Self-reported on-line survey	66 invitees, 3 RT centres (48.5% response rate)	Advanced Practitioners to lead technical developments. 46.9% of respondents were unsure if a master's degree should be a minimum requirement for advanced practice.
Joyce et al. (2022)	UK	Training needs analysis	261 response, 78 RT centres	Only 13 individuals involved with planning and checking adaptive radiotherapy plans. No correlation between years qualified and planning experience.
Lui et al. (2023)	UK	Systematic Review	27 peer-reviewed articles	Optimal training programmes focus on ART system tools to maximise efficiency and understanding of QA.
McNair et al. (2021)	UK	Focus groups and interviews	30 participants, multi-centre	Variability in training practices and resources. Need to include MRI education in pre and post registration programmes. Strong MDT working and inclusive rota essential.
Oliviera et al. (2023)	Europe wide	Training needs analysis	272 responses, 21 countries	IGRT/ART was highlighted as the highest training and educational need for AP roles followed by advanced treatment planning and multi-modal imaging
Rai et al. (2017)	Australia	Report on single centre experience	1 RT centre	Significant inter- professional collaboration needed for MR-guided ART. Rotations in pre-treatment necessary to aid understanding and clinical decision making as well as further education around QA process. Need for formal qualification and accreditation.
Shepherd et al. (2021)	Australia, Europe, US	Report form early ART adopters	5 RT centres	Credentialing activities for ART include pre-training questionnaires, real-time treatment observations, simulations. Training programs must include MDT collaboration and advanced ART tools.

Participants

- HCPC registered Therapeutic Radiographers
- 32 respondents to the survey, 4 interview participants and 6 focus group participants

Method	B4	B5	B6	B7	B8a	B8b	B8c
Survey	0	4	12	8	5	2	1
Focus Group	1	0	1	3	0	0	1
Interview	0	0	0	2	0	0	2



Graph: Participants from each RT centre within the region across the three methods of data collection

Results 2- Thematic Analysis

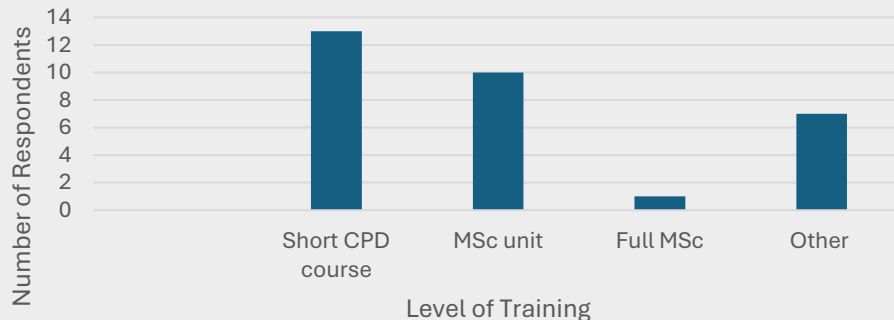
“Enormous void of knowledge” / “Everyone’s going to have to learn”

Graph to Show how Confident Respondents Feel in Their Ability to Adapt Treatment Plans Based During the Course of Radiotherapy



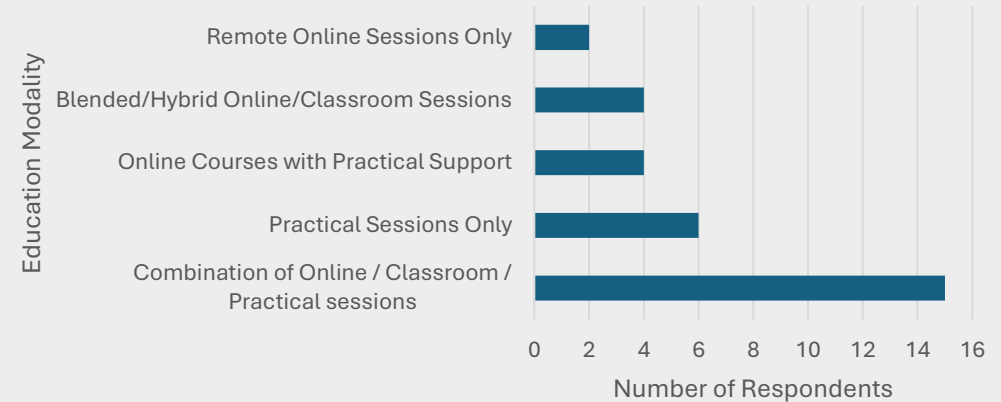
“A robust training programme”

Graph: What Level of Training or Education did the Respondents Feel is Necessary to Effectively Deliver Adaptive Radiotherapy Techniques



“I think everyone learns differently”

Graph Respondents Preferred Modality for Education Around New Technology



Key Findings:

- Time and funding key barriers to education around new technology
- Educational packages tend to be very process driven
- Clinical judgement and decision making is a key area for development
- Inter-disciplinary collaboration is imperative
- Virtual learning environment seen as an effective tool

Conclusion

- Radiographer oART educational needs exist within the region
- Academic underpinning of oART and inter-disciplinary collaboration crucial
- Inter-organisational approach to addressing educational needs is warranted to ensure efficiency and sustainability of clinical oART implementation

Thank you

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