Partial Breast Adaptive Radiation Workflow Decreased Planning Time with Increased Institutional Experience

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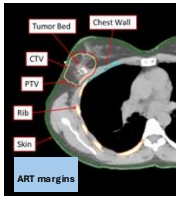
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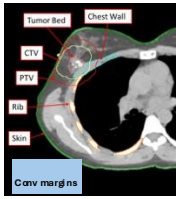
Background

Adaptive radiation therapy (ART) is a personalized treatment approach which adjusts the plan during the radiation course to account for anatomic changes and tumor response, and allows for smaller margins (1). We have implemented a radiation therapy technologist (RTT) driven workflow, which was previously shown to reduce treatment demand on physicians without compromising plan quality (2). Here we report with more experience, the adaptive stereotactic partial breast irradiation (A-SPBI) workflow is more efficient and total treatment time is quicker for patients.

Methods

- We identified patients with early stage breast cancer treated with A-SPBI between 01/2023 – 03/2025 on a CBCT-based ART platform. A total of 867 fractions were evaluated
- 30 Gy / 5 fractions = PTV delivered twice weekly on non-consecutive days
- RTTs prospectively collected treatment planning time = time taken from initial CBCT to time at which the plan was signed





Results

867 A-SPBI fractions were evaluated from 01/2023-03/2025

	Date	Average Time of ART Workflow (min)	Standard Deviation of ART Workflow (min)	Number of Fractions
MD-Driven	Jan-23	14.9	4.3	24
	Feb-23	17.5	4.9	24
	Mar-23	16.6	6.7	21
	Apr-23	17.7	3.5	30
	May-23	19.2	4.0	21
	Jun-23	18.5	4.2	26
RTT Training & Development Implementation	Jul-23	19.0	3.6	37
	Aug-23	21.3	4.9	24
	Sep-23	21.7	4.2	29
	Oct-23	22.3	4.0	9
	Nov-23	21.0	5.3	48
	Dec-23	18.2	4.4	60
	Jan-24	24.1	5.6	54
	Feb-24	24.9	5.1	57
	Mar-24	24.7	4.9	33
	Apr-24	24.9	5.4	40
	May-24	21.1	4.5	34
	Jun-24	23.7	6.2	20
	Jul-24	24.4	6.7	34
	Aug-24	20.3	5.2	20
	Sep-24	26.5	16.3	14
RTT-Driven	Oct-24	17.7	4.1	44
	Nov-24	19.5	4.8	32
	Dec-24	16.4	3.1	20
	Jan-25	17.0	3.5	34
	Feb-25	15.9	3.5	30
	Mar-25	15.7	4.2	48
	Average Total	20.2	5.1	32.1

Figure A. Comparing 03/2025 to 07/2023, RTTs have decreased treatment delivery time by 3.3 minutes per fraction (p=0.0004 welch's t-test) while allowing physicians to review contours and plans remotely, and also doubling total number of delivered fractions.

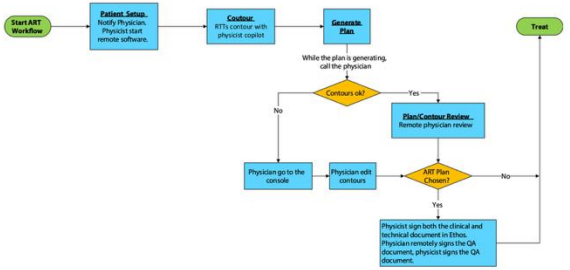


Figure B. RTT-driven clinical workflow

In Conclusion…

With 27 months of follow up and more experience, A-SPBI treatment delivery time has decreased while still maintaining plan quality with an RTT-driven workflow platform.

References

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2. Parsons D, Domal S, Chambers E, Salazar D, Visak J, Arbab M, Holgado F, Li X, Okoro C, Wandrey N, Iqbal Z, Alluri P, Cai B, Keen H, Cleaton J, Godley A, Sher D, Badiyan S, Rahimi A, Lin MH. Feasibility and Impact of a Radiation Therapy Technologist-Driven Workflow for Cone Beam Computed Tomography Guided Partial Breast Adaptive Radiation Therapy. Int J Radiat Oncol Biol Phys. 2025 Jul 15;122(4):893-901.

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