



Coding RT Treatments: Breast Cancer

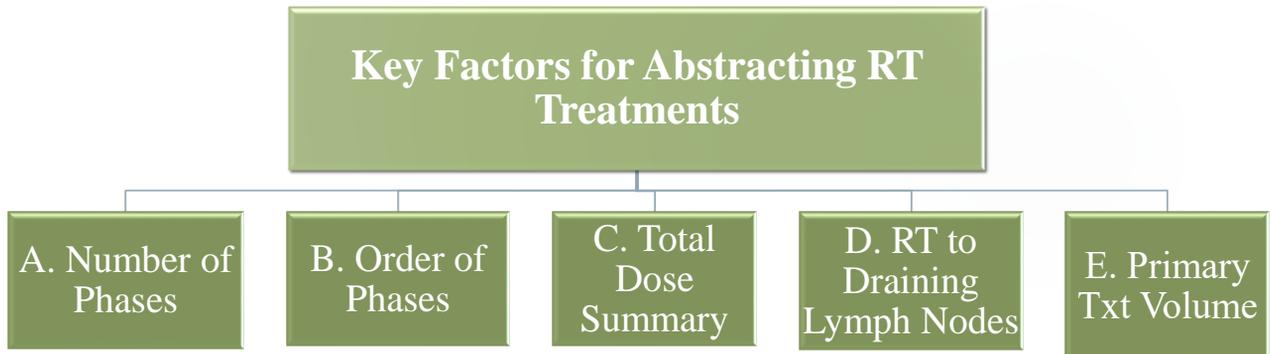
NAACCR

OCTOBER 3, 2019

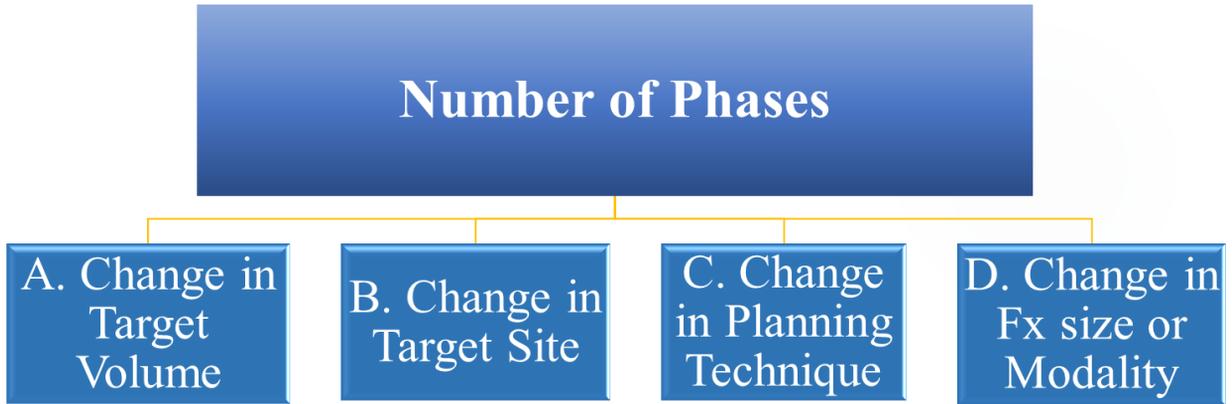
WILSON APOLLO, CTR, RTT, MS

1

2



2



Note: Any one of these changes can result in a new phase

3

Number of Phases- Example 1

A. Change in Target Volume (SIB: Simultaneous Integrated Boost):

Txt Site	Energy	Dose/fx	Total dose	Start date	End date
PTV70, LT tonsils/LNs	6MVX	200	7000	9/11/18	10/30/18
PTV63, high risk region	6MVX	180	6300	9/11/18	10/30/18
PTV54, neck nodes	6MVX	154	5390	9/11/18	10/30/18

Number of Phases? **3 Phases**

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Number of Phases- Example 2

B. Change in Target Site:

*Txt Site	Energy	Dose/fx	Total dose	Start date	End date
T12-L3 spine	6X	250 cGy	2500 cGy	3/4/19	3/15/19
Whole brain (WB)	6MV	300 cGy	3000 cGy	3/4/19	3/15/19

Number of Phases? **2 Phases**

• *Assuming metastatic sites are from same primary.*

• Which is Phase 1?? See Slide # 10

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Number of Phases- Example 3

C. Change in Planning Technique:

Txt Site	Energy, Technique	Dose/fx	Total dose	Treatment Modality	Planning Technique
Prostate	6X/IMRT	180 cGy	4500 cGy	02	05: IMRT
Prostate	I-125 Seed Implant		10,000 cGy	10: LDR, interstitial	88: NA

Number of Phases? **2 Phases**

What is total dose summary?? See Slide # 18, 21

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ALERT!

Recent revision/addition to Order of Phases to the CRT Guide and STORE Manual



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“The Brief” Update

September 12, 2019

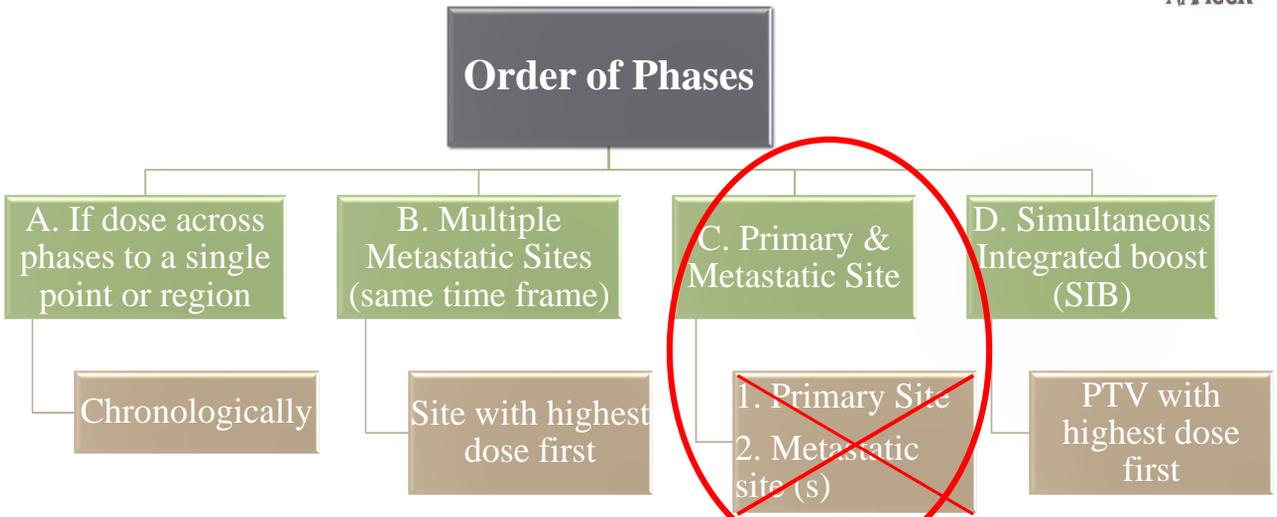
Instructions for coding multiple phases for radiation treatment

When a radiation treatment summary has multiple PHASES (aka delivered prescriptions):

- A.** Code the phases from the earliest to latest start date.
- B.** If there are multiple phases with the same start date, code the phases from highest to lowest total dose.
- C.** If there are multiple phases with the same start date and same total dose, then any order is acceptable.

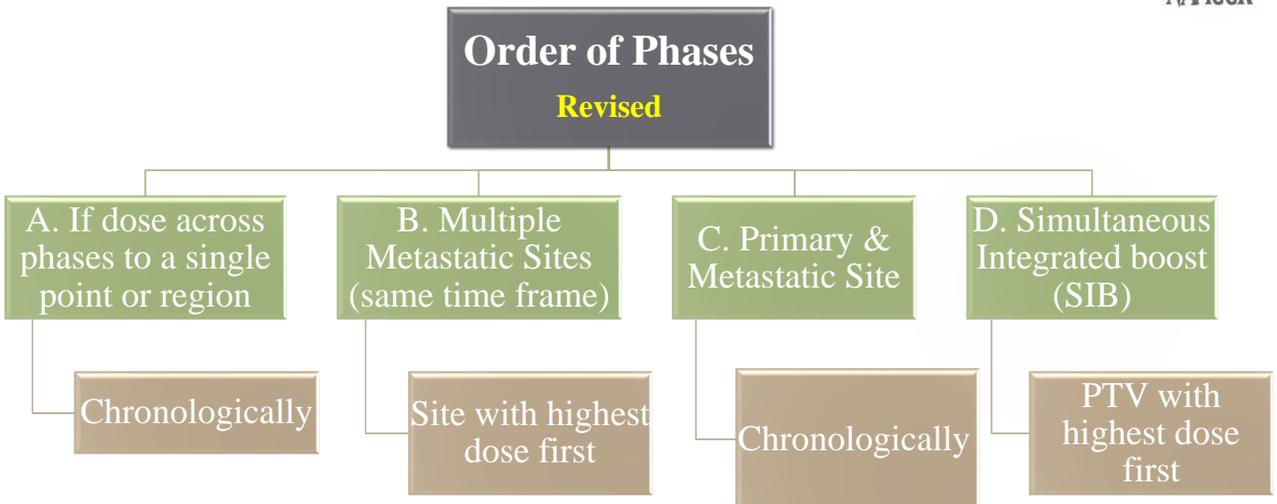


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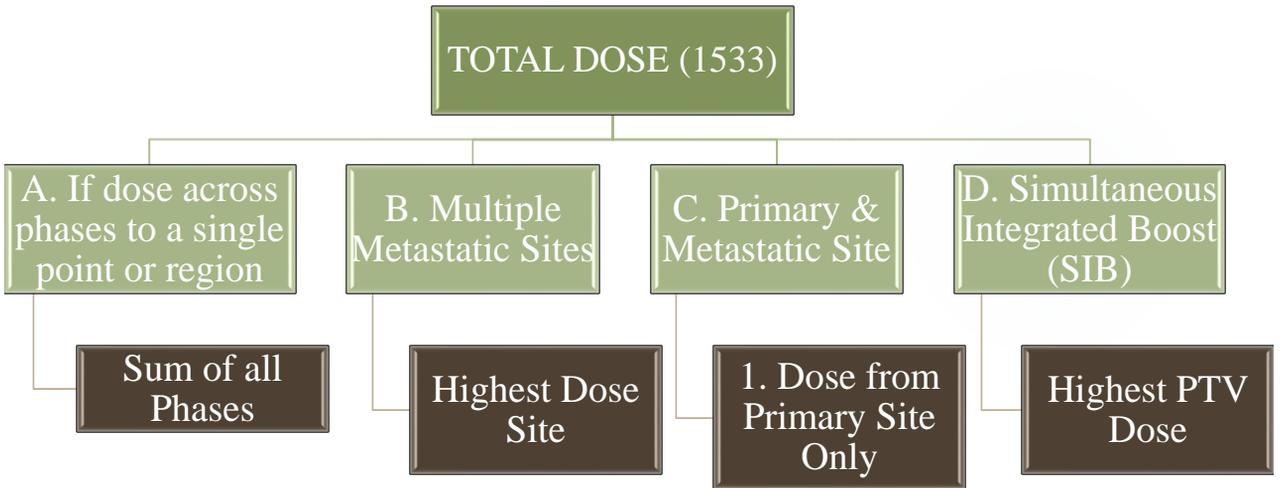
B. If multiple metastatic sites are treated at different time frames (1st course treatment), capture phases chronologically.

C. Metastatic sites chronologically, if at different time frames; site with highest dose first if metastatic sites treated @ same time frame. See "B".



B. If multiple metastatic sites are treated at different time frames (1st course treatment), capture phases chronologically.

C. For sake of simplicity, it was determined that it is best to capture phases in chronological order, even if primary site is omitted due to the 3-phase limit (which is expected to be a rare occurrence).



Radiation Therapy to Draining Lymph Nodes

Key Points

1. SBRT does not target lymph nodes,
2. IORT for breast cancer does not target lymph nodes,
3. Chest wall or lumpectomy **tumor bed/cavity boost** (either photons or electrons) does not include lymph nodes,
4. For pelvic sites, if pelvic/whole pelvis irradiation is mentioned, assume the regional lymph nodes for that site are included,
5. Interstitial or intracavitary brachytherapy(HDR or LDR) does not target regional lymph nodes

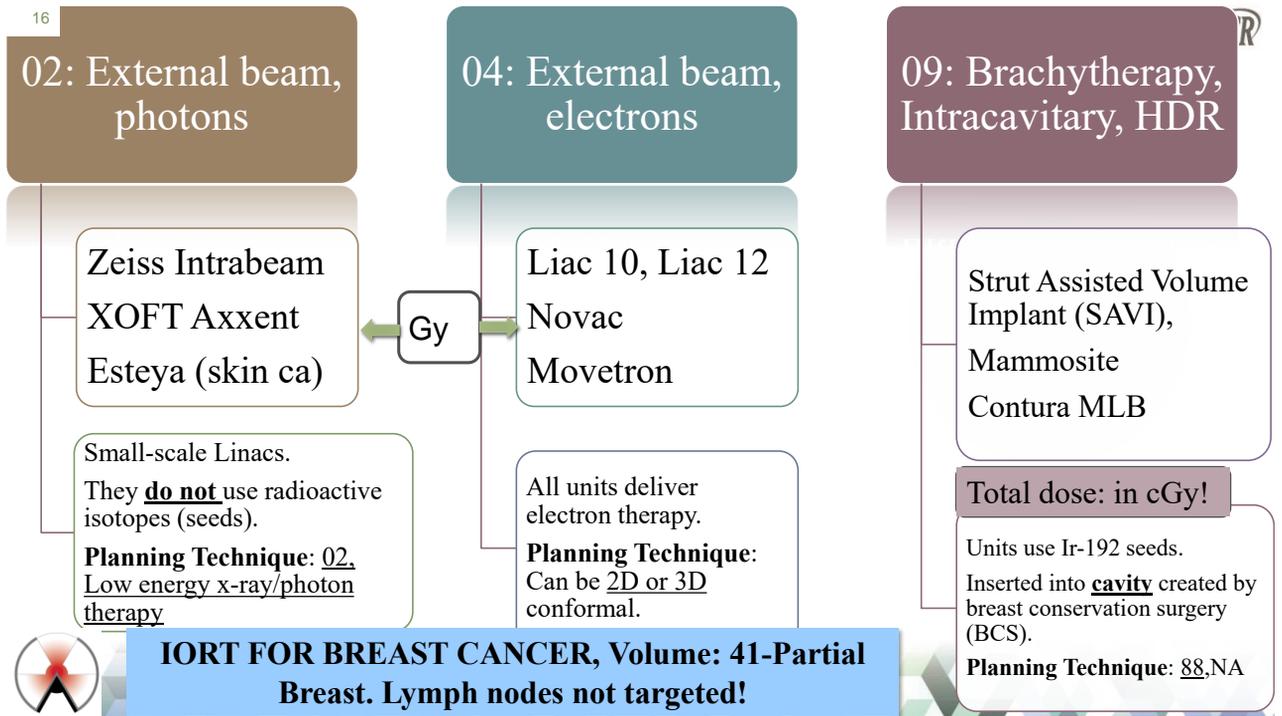
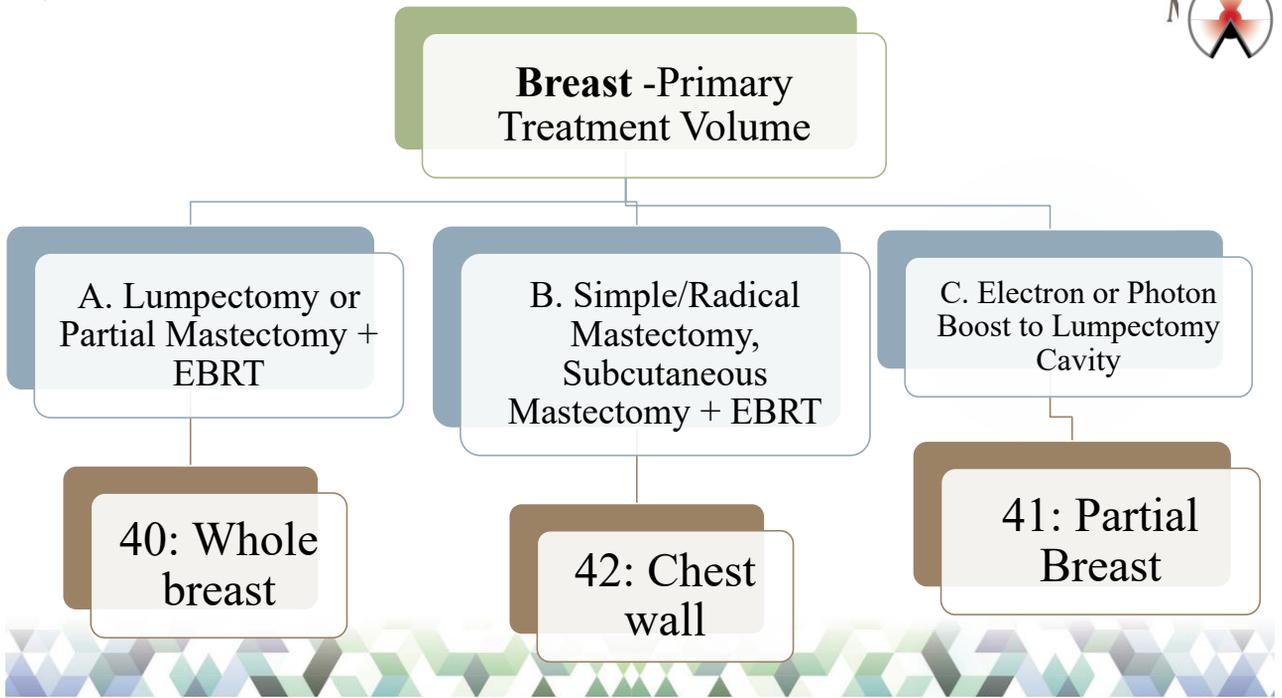


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PRIMARY TREATMENT
VOLUME



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ALERT!

Upcoming revision/addition to Dose/fx and Total Dose for brachytherapy procedures!

Look for upcoming update in The Brief.

Will also be added to the revised CRT Guide and STORE manual



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ALERT!

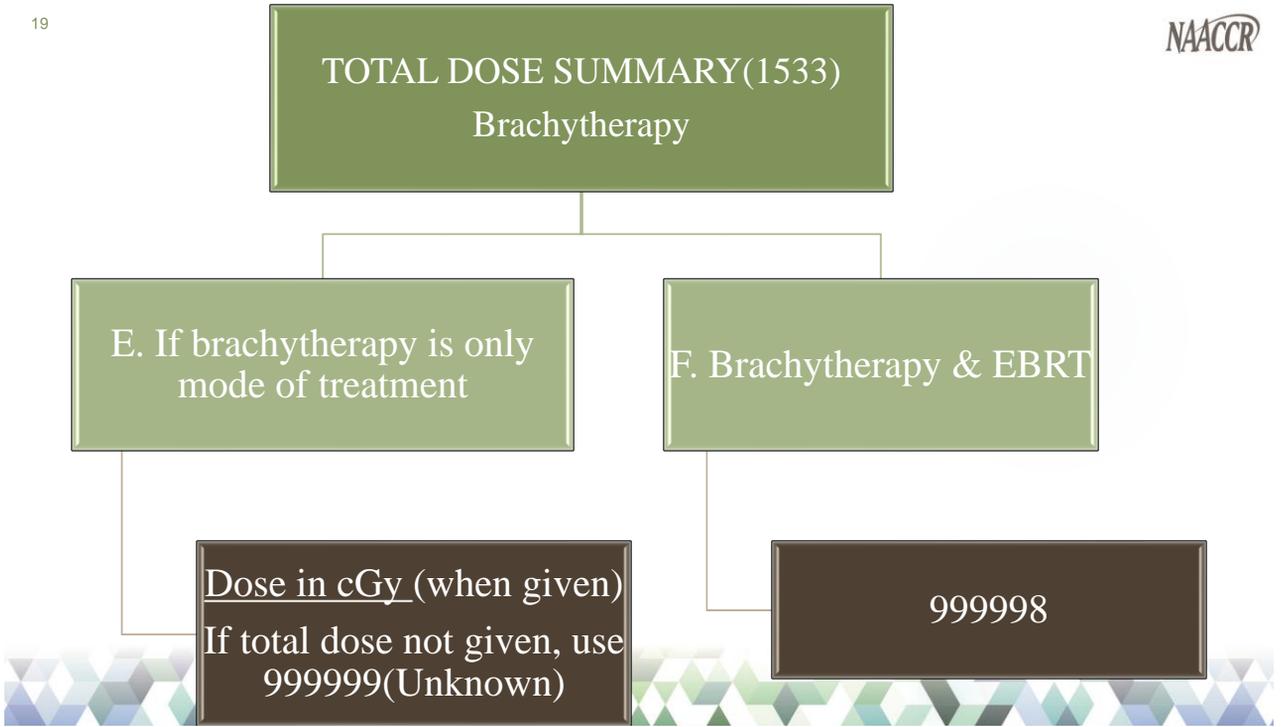
If dose/fraction and total dose is provided in Gy or cGy units for any brachytherapy procedure, capture this information in your abstract. Do not use codes 99998 or 999998 if this information is found in treatment summary!

If brachytherapy is only mode of treatment and dose is not provided in cGy, code to 999999 for total dose.

You **cannot**, however, add dose from EBRT phase to that of brachytherapy phase to get total dose!



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Total Dose E: Example 1

E: If brachytherapy is only mode of txt= Dose in cGy when given.

RT Summary:

Using a 6/1 mini SAVI catheter, RT lumpectomy cavity received 34 Gy in 10 treatments, BID.

Plan ID	Energy	Fx	Dose/fx (cGy)	Total Dose (cGy)	Start Date	End Date
RT breast	SAVI catheters (Ir-192)	10	340	3400		

Number of Phases of Rad Treatments (01) 1 phase

RT Discontinued Early (01) RT completes as prescribed

Total Dose (003400)

Total Dose F: Example 1

F: Brachytherapy + EBRT: Total dose summary = 999998.

Plan ID	Energy	Fx	Dose/fx (cGy)	Total Dose (cGy)	Start Date	End Date
Pelvis, Cervix	6MV/VMAT	25	180	4500	5/3/18	7/26/18
Cervix	Ir-192 HDR brachy	6	400	2400	7/11/18	7/26/18

Number of Phases of Rad Treatments (02) 2 phases

RT Discontinued Early Total Dose (01) RT completes as prescribed (999998)

Note: Total dose for Phase 2 (brachy) will be entered as 002400

Total Dose A: Example

A. If dose across phases to a single point or region >>>Sum of all Phases.

Example 3 Treatment Summary:

67 y/o female with Stage I: T1c, N0, M0, ER/PR+, HER2 negative, G3, invasive ductal carcinoma of RT breast, s/p lumpectomy, underwent EBRT/3D treatment as detailed below:

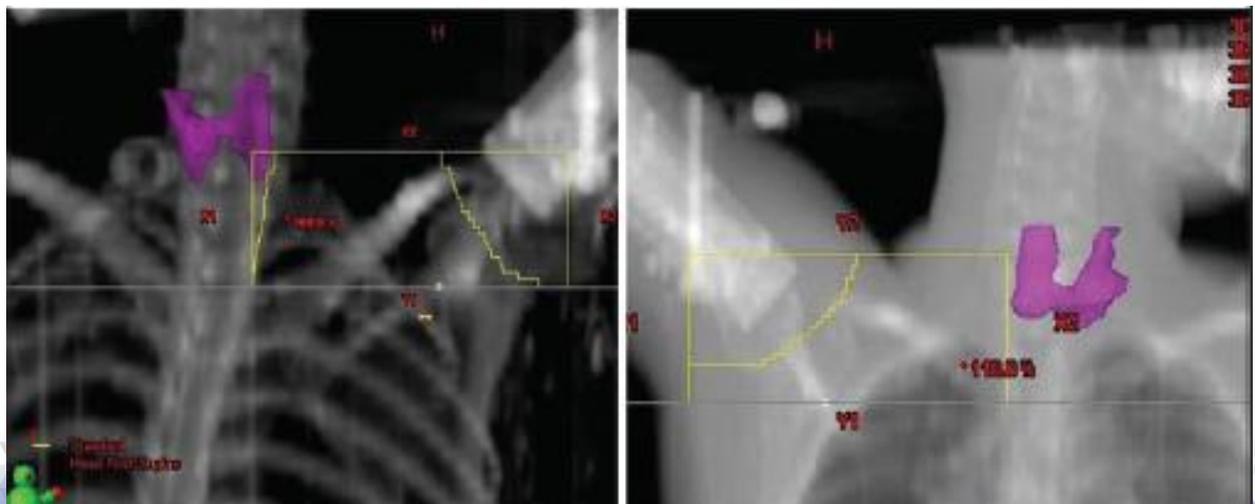
Plan ID	Energy	Fractions	Dose per Fraction (cGy)	Total Dose Delivered (cGy)	Start Date	End Date
Breast eBoost	12MeV	5	200	1,000	2/11/19	2/15/19
RT Breast/IMN	10MV	25	200	5,000	1/7/19	2/8/19

Number of Phases of Rad Tre... (02) 2 phases

Radiation Treatment Discontin... (01) Radiation treatment completed as prescribed

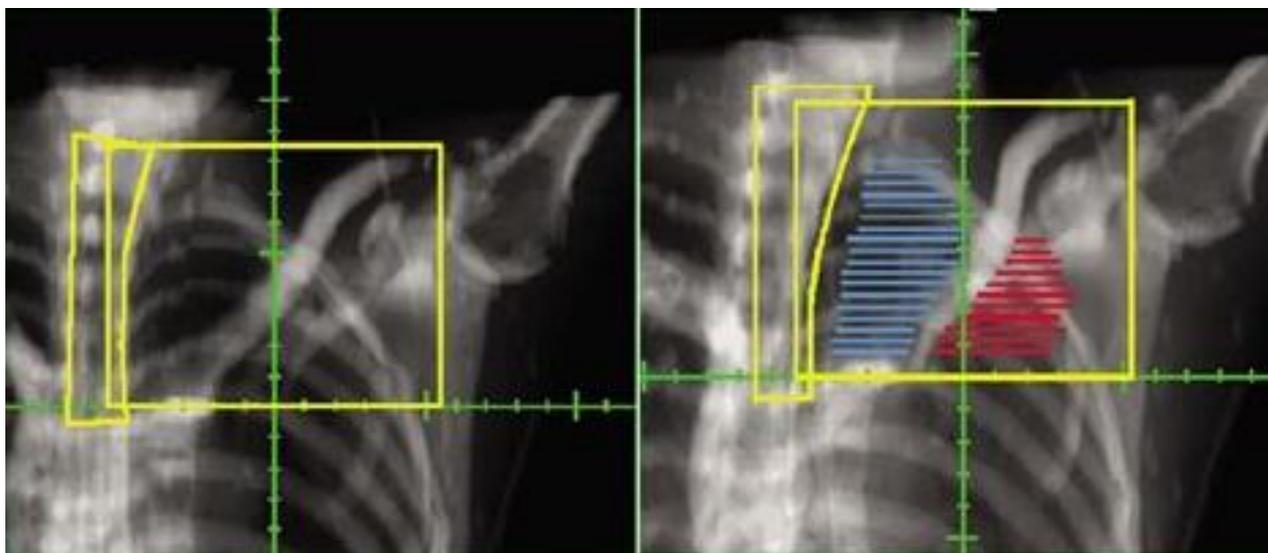
Total Dose (006000)

Typical Supraclavicular field



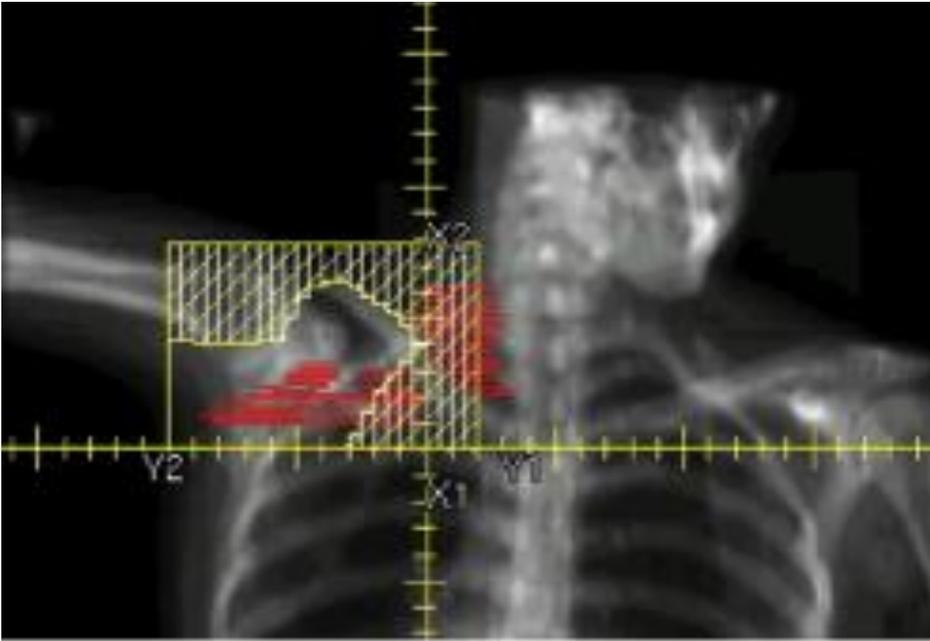
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S'clav & Axillary lymph node field



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Posterior Axillary Boost (PAB) Field



(a)



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Breast Tangents w/ Internal Mammary Nodes (IMN) NAACCR



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CLINICAL SCENARIO 1

55 Y/O W/F w/ RT breast infiltrating ductal carcinoma.

RT Treatment Summary:

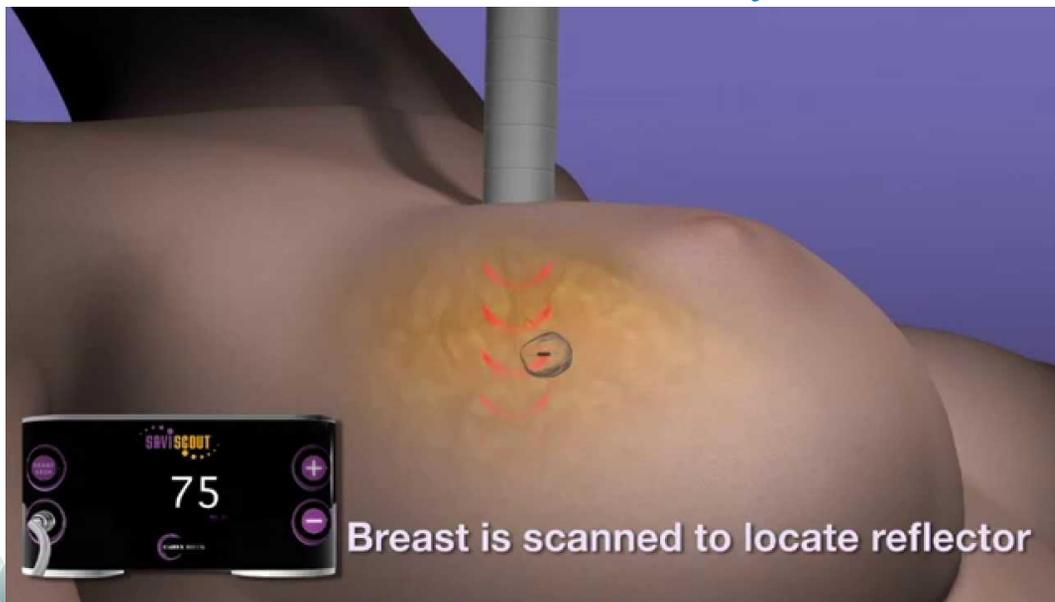
Plan	Energy - Modality	Fractions	Dose/fx (cGy)	Total Dose (cGy)	First txt	Last txt
RT breast	SAVI Ir-192	10/10	340	3,400	7/28/19	8/1/19

Treatment was delivered BID and 6 hours apart each day



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SAVI Scout localizer system



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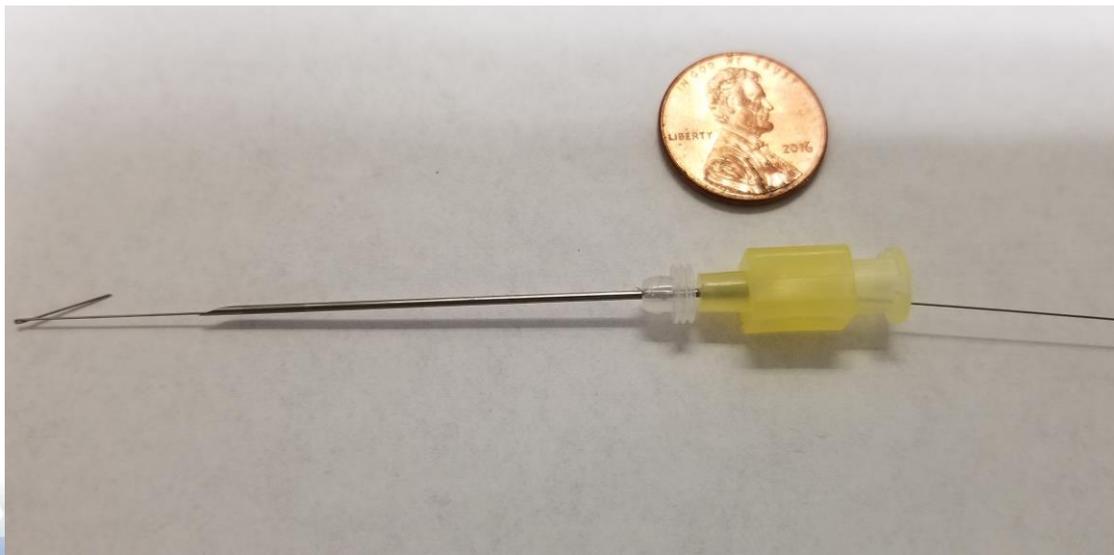
Strut assisted volume implant (SAVI) NAACCR



Device has 7-11 "struts" or catheters through which the **iridium seed** travels. The struts are expanded after the device is inserted into the lumpectomy cavity.

Used for **IORT HDR intracavitary** therapy

Wire Localization



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	#	Field	Code/Definition
Summary	1	Rad/Surg Sequence	3 RT after surgery
	2	Reason No Rad	0 Radiation was admin..
	3	Location of Rad	1 All RT at this facility
	4	Date Started/Flag	7/28/19
	5	Date Finished/Flag	8/1/19
	6	Number of Phases	01
	7	Discontinued Early	01 Radiation completed
	8	Total Dose	003400
Phase 1	9	Volume	41 Partial breast
	10	Rad to Nodes	00 No RT to draining LNs
	11	Modality	09 HDR Intracavitary Brachytherapy
	12	Planning Technique	88 NA
	13	Number of Fractions	010
	14	Dose per Fraction	00340
	15	Total Phase 1 Dose	003400
Phase 2	16	Volume	00
	17	Rad to Nodes	
	18	Modality	
	19	Planning Technique	
	20	Number of Fractions	
	21	Dose per Fraction	
Phase 3	22	Total Phase 2 Dose	
	23	Volume	
	24	Rad to Nodes	
	25	Modality	
	26	Planning Technique	
	27	Number of Fractions	
	28	Dose per Fraction	
	29	Total Phase 3 Dose	

Case 1 Rationale:

#8: If dose is given in cGy, code it as such in the abstract.

#9: IORT brachy to breast does not target whole breast.

#10: IORT does not include LNs.

#11: Ir-192 used with SAVI catheters is HDR brachytherapy. Seeds are inserted into lumpectomy cavity, intracavitary.

#14/15: If treatment summary or RT prescription includes this information in cGy units, enter this into the abstract. Do not use 999998.

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Clinical Scenario 2

70 y/o female w/ infiltrating ductal carcinoma of left breast. Pt underwent a LT breast SAVI Scout reflector localized lumpectomy.

RT Treatment Summary:

Mrs Doe received a dose of 5000 cGy to the left breast, left axilla and left supraclavicular regions over 25 days. 6 MV photons were used for the left breast and axillary treatments. 15 MV photons were used for the treatment of the left supraclavicular region. She received a boost of 1000 cGy in five fractions to the tumor bed, 18 MeV electrons were used to deliver this treatment. All three plans were 3D-conformal.

Start Date: 5/27/19

End Date: 7/9/19

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Clinical Scenario 2

70 y/o female w/ infiltrating ductal carcinoma of left breast. Pt underwent a LT breast SAVI Scout reflector localized lumpectomy.

RT Treatment Summary:

Mrs Doe received a dose of 5000 cGy to the left breast, left axilla and left supraclavicular regions over 25 days. **6 MV photons** were used for the left breast and axillary treatments. **15 MV photons** were used for the treatment of the left supraclavicular region. She received a boost of 1000 cGy in five fractions to the tumor bed, **18 MeV electrons** were used to deliver this treatment. All three plans were **3D-conformal**.

Start Date: 5/27/19

End Date: 7/9/19

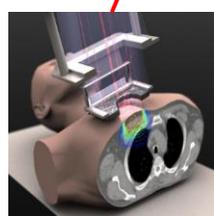
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Clinical Scenario 2

Step 1: Extract treatment information in a format that can be readily interpreted:

Treatment Site	Dose (cGy)	Energy /Technique	Dose/ Fx	Fx	
LT breast tangents/axilla	5,000	6MV conformal	200	25	
LT SCLV	5,000	6X	200	25	
LT breast eBoost	1,000	18E	200	5	



- # of phases
- Order of phases,
- Primary Volume



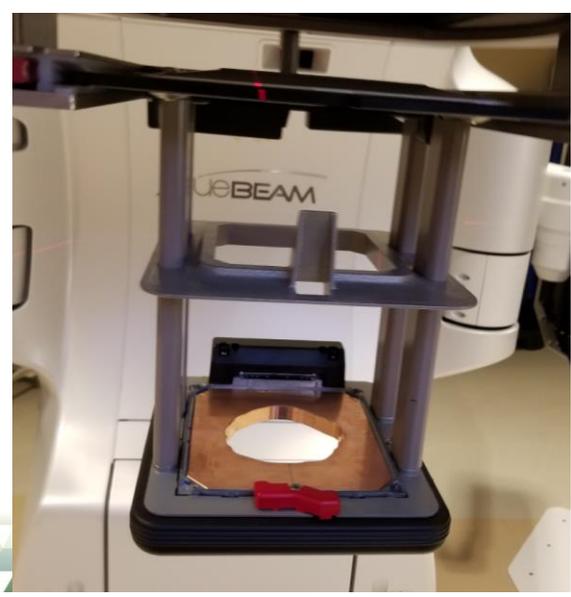
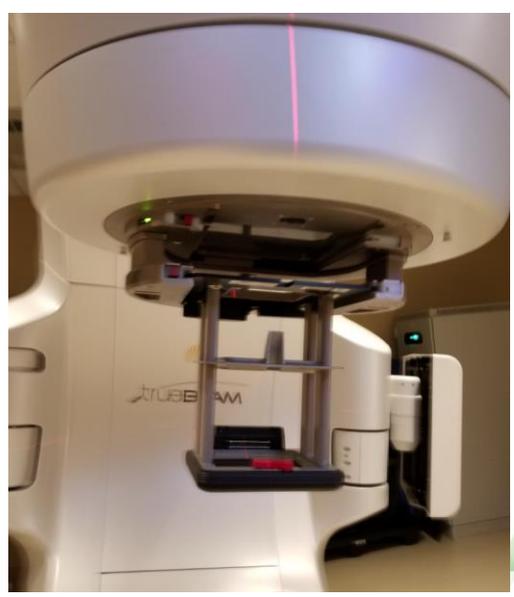
- Treatment Modality,
- Planning Technique

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Electron Therapy



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	#	Field	Code/Definition
Summary	1	Rad/Surg Sequence	3 RT after surgery
	2	Reason No Rad	0 Radiation was admin..
	3	Location of Rad	1 All RT at this facility
	4	Date Started/Flag	5/27/19
	5	Date Finished/Flag	7/9/19
	6	Number of Phases	03
	7	Discontinued Early	01 Radiation completed
	8	Total Dose	006000
Phase 1	9	Volume	40 Whole breast
	10	Rad to Nodes	04 Breast/Chest wall LNs
	11	Modality	02 External beam, photons
	12	Planning Technique	04 3D Conformal
	13	Number of Fractions	025
	14	Dose per Fraction	00200
	15	Total Phase 1 Dose	005000
Phase 2	16	Volume	04 Breast/Chest wall lymph nodes
	17	Rad to Nodes	88 NA
	18	Modality	02 External beam, photons
	19	Planning Technique	04 3D Conformal
	20	Number of Fractions	025
	21	Dose per Fraction	00200
	22	Total Phase 2 Dose	005000
Phase 3	23	Volume (eBoost)	41 Partial breast
	24	Rad to Nodes	00 No RT to draining LNs
	25	Modality	04 External beam, electrons
	26	Planning Technique	04 3D Conformal
	27	Number of Fractions	005
	28	Dose per Fraction	00200
	29	Total Phase 3 Dose	001000

Case 2 Rationale:

#8: When the SCV field is captured as a separate phase, **do not** add the total dose from this phase to get the total dose for all phases. This total includes the dose to the regional site, LT breast (5000 cGy), plus the dose from the LT breast electron boost(1000 cGy).

#10: Txt summary clearly states that axilla was included.

#16: SCLV field targets LNs.

#23: The breast boost targets a much smaller volume than the entire breast. It does not encompass any regional lymph nodes.

#26: Breast boosts are generally delivered via conformal plans, including electron boosts.

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Clinical Scenario 2

You can also abstract the RT treatment as two phases!

Your choice!

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	#	Field	Code/Definition
Summary	1	Rad/Surg Sequence	3 RT after surgery
	2	Reason No Rad	0 Radiation was admin..
	3	Location of Rad	1 All RT at this facility
	4	Date Started/Flag	5/27/19
	5	Date Finished/Flag	7/9/19
	6	Number of Phases	02
	7	Discontinued Early	01 Radiation completed
	8	Total Dose	006000
Phase 1	9	Volume	40 Whole breast
	10	Rad to Nodes	04 Breast/Chest wall LNs
	11	Modality	02 External beam, photons
	12	Planning Technique	04 3D Conformal
	13	Number of Fractions	025
	14	Dose per Fraction	00200
	15	Total Phase 1 Dose	005000
Phase 2	16	Volume (eBoost)	41 Partial breast
	17	Rad to Nodes	00 No RT to draining LNs
	18	Modality	04 External beam, electrons
	19	Planning Technique	04 3D Conformal
	20	Number of Fractions	005
	21	Dose per Fraction	00200
	22	Total Phase 2 Dose	001000
Phase 3	23	Volume	00
	24	Rad to Nodes	
	25	Modality	
	26	Planning Technique	
	27	Number of Fractions	
	28	Dose per Fraction	
	29	Total Phase 3 Dose	

Case 2 Rationale (2-Phase):

#8: When the SCV field with the "regional" dose/phase, **do not** add the total dose from this phase to get the total dose for all phases. This total includes the dose to the regional site, LT breast (5000 cGy), plus the dose from the LT breast electron boost(1000 cGy).

The SCLV & axillary LN fields are included in Phase 1.

#16: Electron boost targets a much smaller volume than the whole breast. It does not include LNs(#17)

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Clinical Scenario 3

75 y/o female w/ poorly diff infiltrating ductal carcinoma of left breast. Pt underwent a LT breast needle loc partial mastectomy. ER/PR+. HER2 IHC= neg. G3

RT Treatment Summary:

Patient received 5000 cGy to the LT breast tangents, RAO/LPO with 6X photons conformal plan. Additionally, the LT SCLV and axilla received 5000 cGy, 200 cGy in 25 fractions. The LT lumpectomy cavity was boosted with 6MV, 2 Gy x 5 fx. PAB boost: 1.8 Gy x 3 fx.

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Clinical Scenario 3

75 y/o female w/ poorly diff infiltrating ductal carcinoma of left breast. Pt underwent a LT breast needle loc partial mastectomy. ER/PR+. HER2 IHC= neg. G3

RT Treatment Summary:

Patient received **5000 cGy** to the **LT breast tangents**, RAO/LPO with **6X photons conformal plan**. Additionally, the **LT SCLV and axilla** received **5000 cGy, 200 cGy in 25 fractions**. The LT lumpectomy cavity was boosted with **6MV, 2 Gy x 5 fx**. **PAB boost: 1.8 Gy x 3 fx**.



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Clinical Scenario 3

Txt Site	Energy – Modality	Dose/fx (cGy)	# fx	Total Dose (cGy)	Start Date	End Date
LT breast, RAO/LPO	6X/Conformal	200	25	5,000	7/15/19	8/16/19
LT SCLV/Axilla	6X/Conformal	200	25	5,000	7/15/19	8/16/19
LT Breast boost	6X/Conformal	200	5	1,000	8/19/19	8/23/19
PAB boost	6X/Conformal	180	3	540	8/19/19	8/21/19



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Clinical Scenario 3

Two options on capturing phases:

1. Preferred/recommended option: capture as three phases,
2. Optional: capture as 4 phases, but you will be losing the PAB boost (must be documented, however).



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	#	Field	Code/Definition
Summary	1	Rad/Surg Sequence	3 RT after surgery
	2	Reason No Rad	0 Radiation was admin..
	3	Location of Rad	1 All RT at this facility
	4	Date Started/Flag	7/15/19
	5	Date Finished/Flag	8/23/19
	6	Number of Phases	03
	7	Discontinued Early	01 Radiation completed
	8	Total Dose	006000
Phase 1	9	Volume	40 Whole Breast
	10	Rad to Nodes	04 Breast/Chest wall LN region
	11	Modality	02 External beam, photons
	12	Planning Technique	04 3D conformal
	13	Number of Fractions	025
	14	Dose per Fraction	00200
	15	Total Phase 1 Dose	005000
Phase 2	16	Volume (LT breast boost)	41 Partial breast
	17	Rad to Nodes	00 No RT to draining LNs
	18	Modality	02 External beam, photons
	19	Planning Technique	04 3D conformal
	20	Number of Fractions	005
	21	Dose per Fraction	00200
	22	Total Phase 2 Dose	001000
Phase 3	23	Volume (PAB)	04 Breast/Chest wall LN regions
	24	Rad to Nodes	88 NA
	25	Modality	02 External beam, photons
	26	Planning Technique	04 3D conformal
	27	Number of Fractions	003
	28	Dose per Fraction	00180
	29	Total Phase 3 Dose	000540

Case 3a Rationale:

- #8:** When breast tangents & SCLV fields are captured in a single phase, do not add the prescription for each.
- #9:** Breast tangents target whole breast
- #10:** SCLV/axilla field included here
- #16:** Breast Boost irradiates a much smaller volume. LNs not included (#17)
- #23:** PAB, by definition, targets LNs only.

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	#	Field	Code/Definition
Summary	1	Rad/Surg Sequence	3 RT after surgery
	2	Reason No Rad	0 Radiation was admin..
	3	Location of Rad	1 All RT at this facility
	4	Date Started/Flag	7/15/19
	5	Date Finished/Flag	8/23/19
	6	Number of Phases	04
	7	Discontinued Early	01 Radiation completed
	8	Total Dose	006000
Phase 1	9	Volume	40 Whole Breast
	10	Rad to Nodes	00 No RT to draining LNs
	11	Modality	02 External beam, photons
	12	Planning Technique	04 3D conformal
	13	Number of Fractions	025
	14	Dose per Fraction	00200
	15	Total Phase 1 Dose	005000
Phase 2	16	Volume (LT SCLV/axilla)	04 Breast/Chest wall LN region
	17	Rad to Nodes	88 NA
	18	Modality	02 External beam, photons
	19	Planning Technique	04 3D conformal
	20	Number of Fractions	025
	21	Dose per Fraction	00200
	22	Total Phase 2 Dose	005000
Phase 3	23	Volume (LT breast boost)	41 Partial breast
	24	Rad to Nodes	00 No RT to draining LNs
	25	Modality	02 External beam, photons
	26	Planning Technique	04 3D conformal
	27	Number of Fractions	005
	28	Dose per Fraction	00200
	29	Total Phase 3 Dose	001000

Case 3b Rationale:



#8: When breast tangents & SCLV fields are captured as two separate phases, **do not** add the prescription for each.

#9: Breast tangents target whole breast

#10: SCLV/axilla field **not** included here

#16: SCLV specifically targets LNs.

#23: The breast boost volume is small and does not include LNs.

Here the PAB phase is omitted.

However, include all details of this phase in the Notepad.

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Resources



- “Handbook of Evidence-Based Radiation Oncology”, 3rd ed. 2018 Edition

- “Principles and Practice of Radiation Therapy” 4th edition

Excellent textbook.

Hard copy: \$191

Kindle edition: \$147

Consider a used copy

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Principles and Practice of Radiation Therapy, 4th Edition



Resources



- <https://www.acr.org/Clinical-Resources/Practice-Parameters-and-Technical-Standards/Practice-Parameters-by-Subspecialty>

There are a couple of links you will find tremendously useful:

- Radiation Oncology: General
- Radiation Oncology: Radiation Therapy
- NCCN Guidelines-provides therapeutic dose range for most sites.



