



**Breast Part 1-
Treatment**

**NAACCR
2022-2023
Webinar
Series**

If you experience technical Difficulties, please email Angela
amartin@naacccr.org

10/6/22

1

Q&A

- Please submit all questions concerning the webinar content through the Q&A panel.
- If you have participants watching this webinar at your site, please collect their names and emails.
- We will be distributing a Q&A document in about one week. This document will fully answer questions asked during the webinar and will contain any corrections that we may discover after the webinar.

2

2

Fabulous Prizes



3

Guest Presenter

- Wilson Apollo, CTR
 - Retired NY State Licensed Radiation Therapist

4

Agenda

- Surgery (Briefly)
- Radiation
- Systemic
- Case Scenarios

5

Surgery of Primary Site

- Surgery of primary site (1290)
 - Required for all diagnosis years
- Surg Breast
 - Required for cases diagnosed 2022 and 2023 (CoC facilities only)

20 Partial mastectomy, NOS; less than total mastectomy

21 Partial mastectomy WITH nipple resection

22 Lumpectomy or excisional biopsy

23 Reexcision of the biopsy site for gross or microscopic residual disease

24 Segmental mastectomy (including wedge resection)

Procedures coded 20–24 remove the gross primary tumor. They are not breast-conserving or preserving. There may be microscopic residual disease.

B200	Partial mastectomy; less than total mastectomy; quadrantectomy, tylectomy, with or without axillary lymph node dissection
B210	Excisional breast biopsy - Diagnostic excision of cancer
<p>NOTE: An excisional biopsy can occur when the nodule was not palpable.</p> <p>Example: Use code B210, when a surgeon removes the mass (either core or FNA) done prior to the mass being removed.</p>	
B215	Excisional breast biopsy, for atypia

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6

Surgery of Primary Site

- Surg Breast Recon
 - Required for cases diagnosed 2022 and 2023 (CoC facilities only)
 - Code only the ipsilateral breast reconstruction
 - Code only the procedures performed during the same day operative procedure

A200	Direct to implant placement
NOTE: Code A200 when a permanent implant is placed by a plastic surgeon (some general /breast su	
Example: A mastectomy is performed by the	
plastics).	
A300	Oncoplastic tissue rearrange
A400	Oncoplastic reduction and/c

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7

Scope of Regional Lymph Nodes

Code	Label
0	No Lymph Node Surgery
1	Biopsy or Aspiration of Lymph Node
2	Sentinel Lymph Node Biopsy
3	Number of regional lymph nodes removed unknown or not stated; regional lymph nodes removed, NOS
4	1-3 regional lymph nodes removed
5	4 or more nodes removed
6	Sentinel nodes biopsy and code 3,4, or 5 at same time
7	Sentinel nodes biopsy and code 3,4, or 5 at different time
9	Unknown

- AJCC N Suffix
 - An "f" or "sn" may be used with codes 1 or 2
 - Suffix should be blank for codes 4-7

8

Sentinel Nodes Positive/Examined

- Records the number of lymph nodes pos/examined during a sentinel node procedure.
 - “non-sentinel” nodes are included in the count if they are removed during the sentinel node procedure.

9

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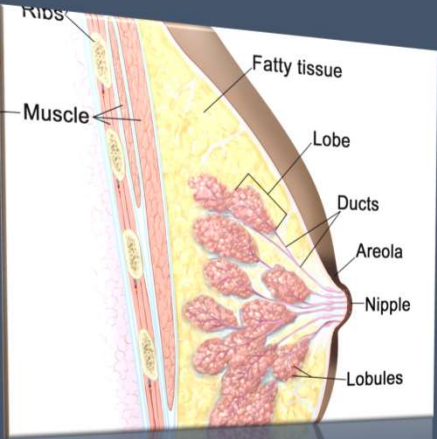
Surgical Procedure/Other Site

- Surgical Procedure of Other Site describes the surgical removal of distant lymph node(s) or other tissue(s) or organ(s) beyond the primary site.
 - Do not code removal of uninvolved contralateral breast in this data item.

SEER Program Coding and Staging Manual 2022

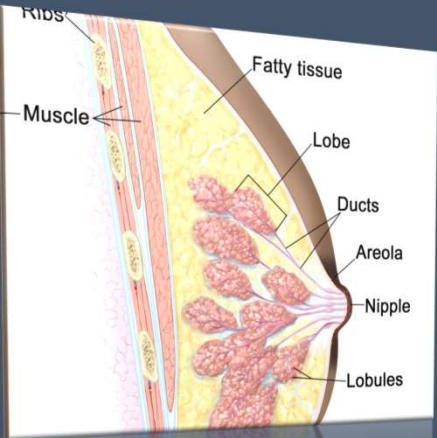
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Questions?

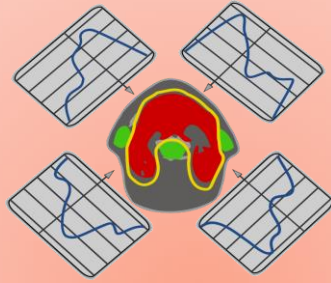
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EBRT & Adjuvant/Neoadjuvant Therapy

Wilson Apollo, MS, CTR
WHA Consulting

12

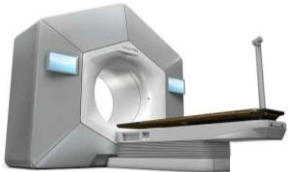


Part 1: EBRT & Adjuvant/Neoadjuvant Therapy Guidelines for Management of Breast Cancer

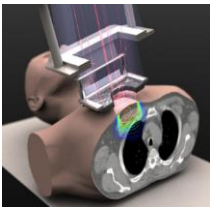
Wilson Apollo, MS, CTR
 WHA Consulting
 NAACCR-Breast Cancer

October 5, 2022
 WHA Consulting

External Beam Radiation Therapy (EBRT)



Linear Accelerators: Multiple varieties/capabilities. Linac, older units can deliver photon and electron therapy. Newer linacs deliver photon therapy mode only. There are also linacs specifically designed to deliver electron therapy





EBRT

02: Photons

Look for beam energy # followed by any of the following units: **MV, MVX, X, kV.**

Example: 6MV, 10X, 12MVX, 50 kV

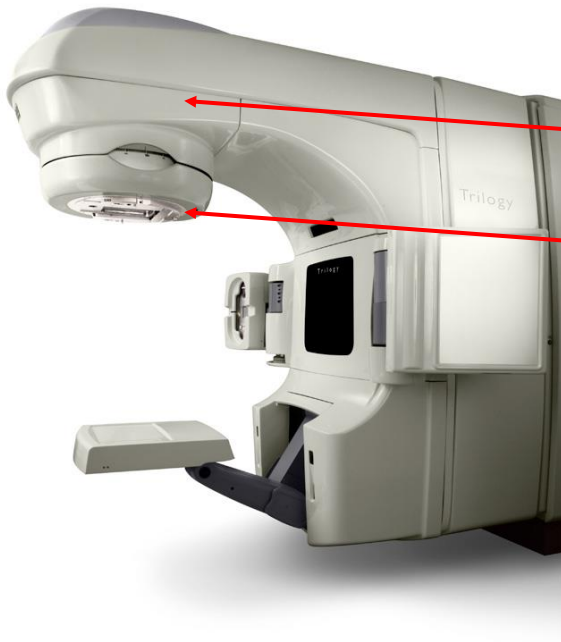
03: Protons

Look for unit of absorbed dose: **cG_e** (Cobalt Gray Equivalent)

04: Electrons

Look for beam energy with units of **MeV, E.**
Example: 9E (or 9e), 12 MeV, or “en face”

Linear Accelerator-Linac



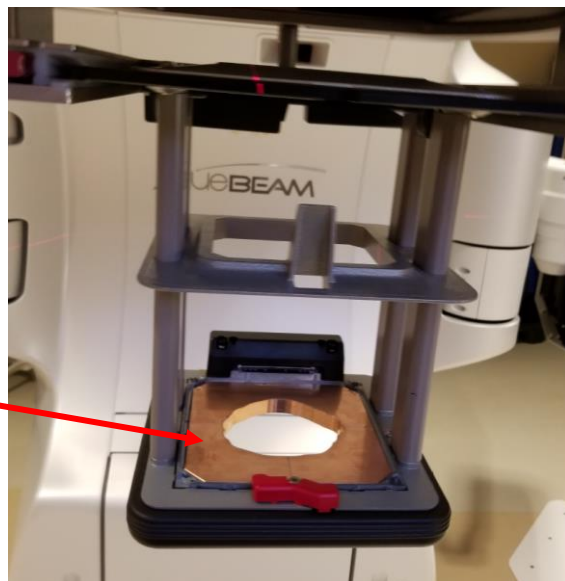
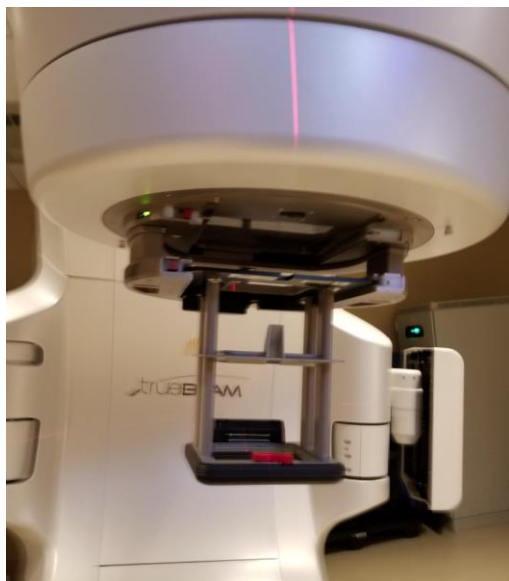
Gantry

Collimator





Electron Therapy



Electron
cut-out

**02:
Photons**

02: low energy x-ray, photons
03: 2D therapy
04: Conformal or 3D
05: IMRT
06: SRS, Radiosurgery, NOS
07: SRS, Radiosurgery, robotic
08: SRS, Gamma Knife
09: CT-guided online adaptive
10: MR-guided online adaptive

**03:
Protons**

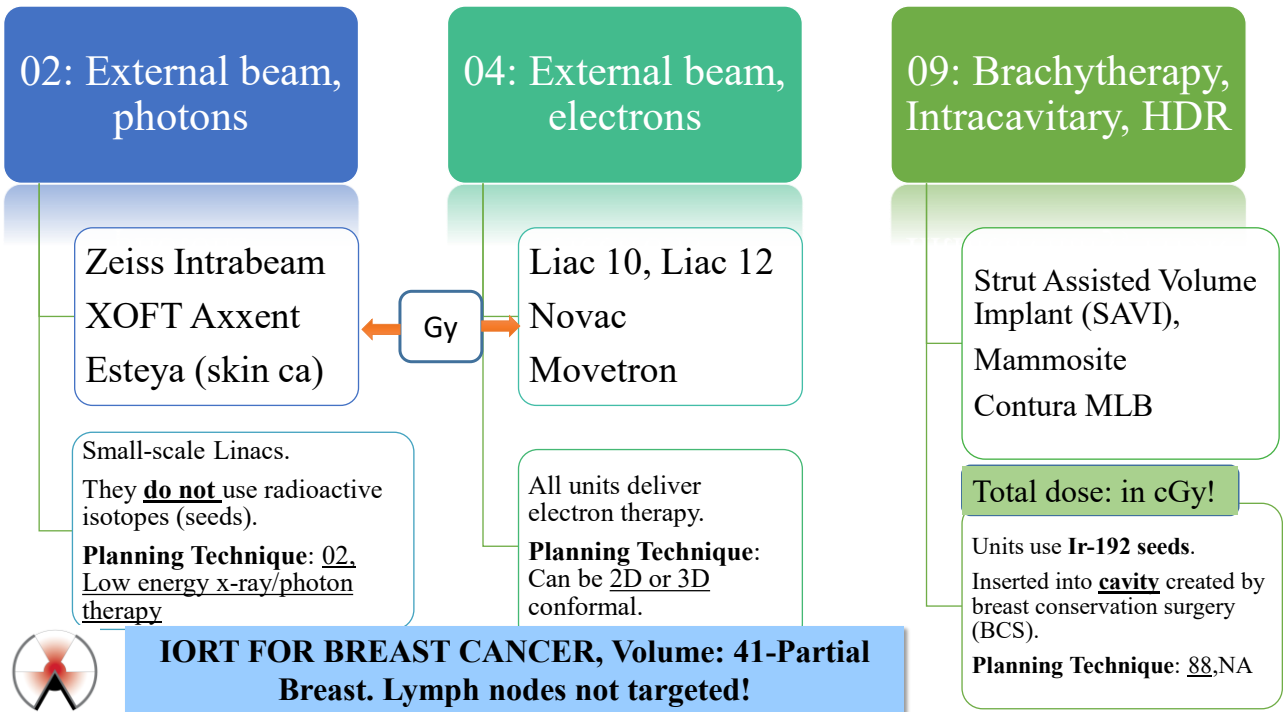
04: Conformal or 3D
05: IMRT (IMPT)
06: SRS,
Radiosurgery, NOS

**04:
Electrons**

03: 2D therapy
04: Conformal or 3D
(think breast boost!)

**Treatment Planning Techniques
Associated with EBRT**





Radiation Therapy for Breast Cancer, Early Stage-Overview

Dose Recommendations for Radiation Therapy



- Whole Breast Irradiation:
 - Breast:
 - 42.56 Gy in 16 fractions of 2.66 Gy q day
 - 40.05 Gy in 15 fractions of 2.67 Gy q day
 - 50 Gy in 25 fractions of 2 Gy q day
 - Sequential Boost:
 - 10 Gy in 5-4 fractions of 2.0-2.5Gy (either photon or electron boost)
- Accelerated **Partial Breast Irradiation (APBI)**:
 - Lumpectomy PTV eval: 38.50 Gy in 10 fraction of **3.85 Gy** BID with minimum of 6-7 hours between each fraction
 - Lumpectomy PTV eval: 30 Gy in 5 fractions of **6 Gy** delivered every other day
- Partial Breast Irradiation
 - Lumpectomy PTV eval: 40.05 Gy in 15 fractions of 2.67 Gy q day

Courtesy of Dr. Leila Tchelebi

Breast Boost Rationale/Considerations



Front Oncol 2020; 10:772

- Reduce risk of local recurrence, particularly in younger patients (**age** biggest factor),
- Close margins (<2 mm for invasive), Tumor grade, LVI status, HR status may be considered as well,
- Cosmetic outcomes (Short term: hyperpigmentation, skin induration, dermatitis, breast edema. Long-term: breast fibrosis),
- Delivered to lumpectomy site, tumor bed, surgical clips,
- On discretion of managing rad onc, variability
- Cost consideration:
 - WBI w/ 3D plan in US: \$20,637. With boost = \$22,130.



Breast Boost- Invasive carcinoma

- +margins post surgical resection
- Age 50 and younger,
- Ages 51-70, with high-grade tumor

May omit breast boost **if**

- Older >70 w/ low-intermediate grade, HR+ w/ widely negative margins.

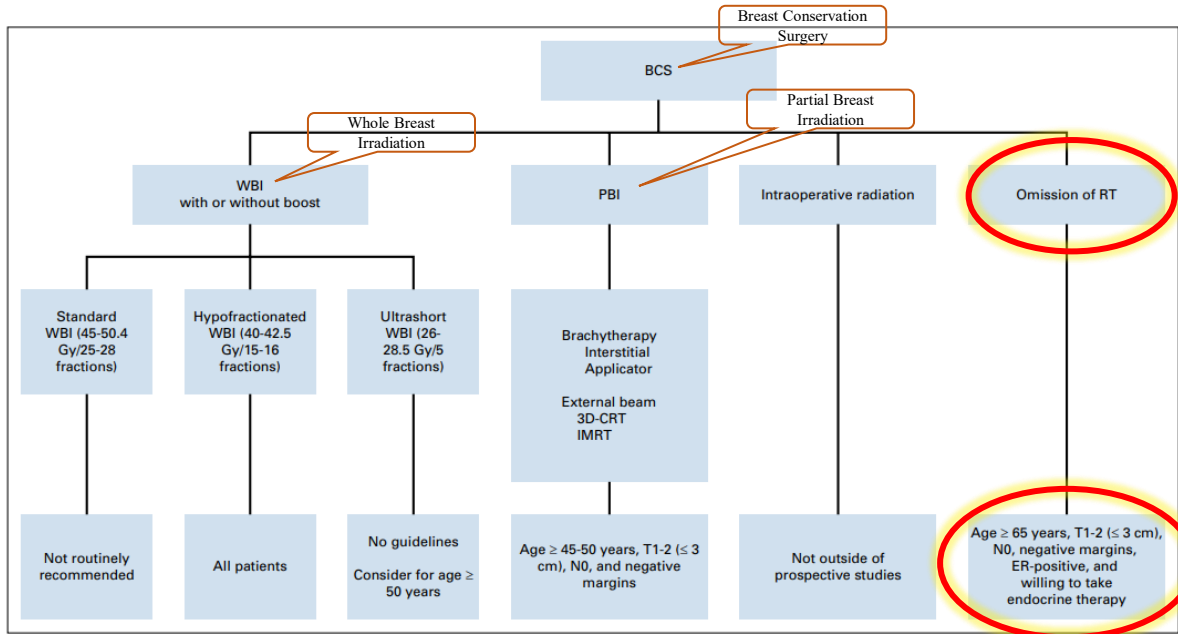


Breast Boost- DCIS

- 50 and younger,
- Patients with high-grade tumors and/or positive margins or close margins following resection,

May omit a boost **if**,

- >50 yr-old,
- Screen-detected cancer,
- Small, low-intermediate grade tumor
- Widely negative margins post surgery



Shah, JCO Oncology Practice, 2021

Courtesy of Dr. Leila Tchelebi



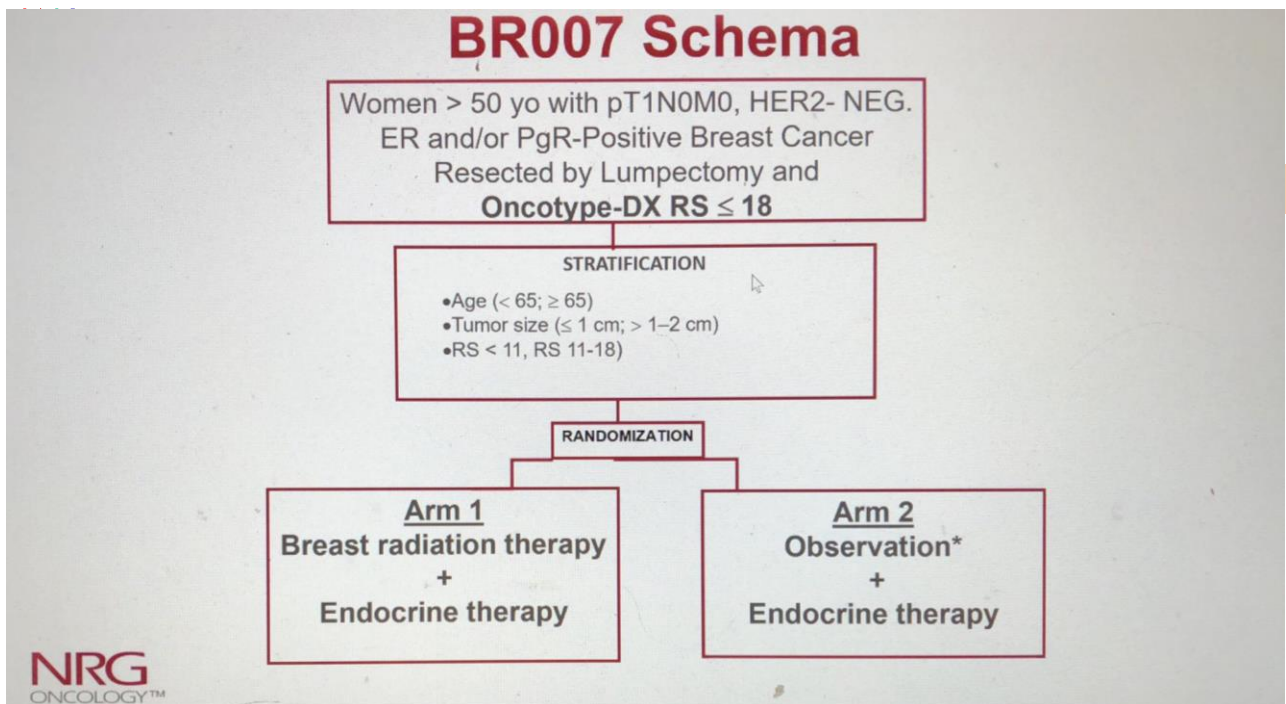
NRG-BR007: Phase III: Evaluating De-escalation of Breast Radiation (DEBRA) for Conservative Treatment of Stage 1, HR+, HER2-, RS <18 Breast Cancer
Principal Investigator: Julia White, MD

Courtesy of Dr. Leila Tchelebi



NRG-BR007 (DEBRA) Trial-Background

- ~50% of pts diagnosed w/ breast cancer are stage 1, ER/PR+, HER2 negative,
- Tests such as Oncotype DX Recurrence scores can identify a patient population that will benefit from chemo and vice versa,
- **Hypothesis:** Breast conservation surgery (BCS) is noninferior to BCS + RT for pts planning endocrine therapy and who are stage 1, ER/PR+, HER2 neg w/ Oncotype RS= ≤ 18 .
- Measured by looking at recurrence rate of randomized arms;
 - a. BCS + Endocrine therapy, observation,
 - b. BCS + EBRT (+/- boost), + Endocrine therapy
- Trail remains open.





Hypofractionation

Trial	Years of Accrual	No. of Patients	F/U (years)	Radiation Dose	Local Recurrence with SWBI (%)	Local Recurrence with AWBI (%)	Toxicity
Ontario Oncology Group	1993-1996	1,234	12	42.56 Gy/16 fx 50 Gy/25 fx	6.2	6.7	No significant difference cosmetic outcomes (71.3% SWBI v 69.8% HWBI)
START-A	1999-2002	2,236	9.3	50 Gy/25 fx 41.6 Gy/13 fx 39 Gy/13 fx (all over 5 weeks)	6.7	5.6 8.1	No difference 50 Gy, 41.6 Gy with moderate or marked normal tissue effects; reduced induration/telangiectasia/edema with 39 Gy v 50 Gy
START-B	1999-2001	2,215	10	50 Gy/25 fx 40 Gy/15 fx	5.2	3.8	Breast shrinkage, telangiectasia, and edema significantly lower with 40 Gy

- Current standard of care: 40 Gy in 15 Fx or 42.56 Gy in 16 Fx

Courtesy of Dr. Leila Tchelebi



Ultra-short Fractionation

Trial	Years of Accrual	No. of Patients	F/U (years)	Radiation Dose	Local Recurrence with Standard or Hypofractionated	Local Recurrence with Ultrashort	Toxicity
FAST	2004-2007	915	9.9	50 Gy/25 fx 30 Gy/5 fractions (once weekly) 28.5 Gy/5 fractions (once weekly)	Three recurrences	Four recurrences in 30 Gy and 28.5 Gy arms	OR moderate or marked normal tissue effects (v 50 Gy) 28.5 Gy: 1.22 30 Gy: 2.12
FAST-Forward	2011-2014	4,096	5.9	40 Gy/15 fx 27 Gy/5 fx 26 Gy/5 fx	2.1%	(v 40 Gy) 27 Gy: -0.3% 26 Gy: -0.7%	Moderate or marked normal tissue effects 40 Gy: 9.9% 26 Gy: 11.9% 27 Gy: 15.4%

- Pros: more convenient for patients
- Cons: shorter follow-up as compared to hypofractionation trials
- Conclusion: Ultra-short WBI is a reasonable alternative for select patients refusing 3 weeks of treatment

Courtesy of Dr. Leila Tchelebi



APBI

Trial	Years of Accrual	No. of Patients	F/U (years)	Radiation Dose/ Technique	Local Recurrence with WBI (%)	Local Recurrence with APBI (%)	Toxicity
National Institute of Oncology-Hungary	1998-2004	258	17	36.4 Gy/8 fx (interstitial) 50 Gy/25 fx (electrons)/ interstitial/electron	7.9	9.6	Improved cosmesis with APBI (81% v 63%)
GEC-ESTRO	2004-2009	1,184	6.6	32 Gy/8 fx 30.2 Gy/7 fx (HDR)/ 50 Gy (PDR)/ interstitial	0.9	1.4	Reduced late grade 2-3 skin toxicity with APBI
University of Florence	2005-2013	520	10.7	30 Gy/5 fx (every other day)/IMRT	2.5	3.7	Less acute and chronic toxicity with APBI
NSABP B39	2005-2013	4,216	10.2	38.5/10 fx 3D-CRT, 34 Gy/10 fx brachytherapy	3.9	4.6	Grade 3 toxicity: 10% APBI v 7% WBI
RAPID	2006-2011	2,135	8.6	38.5 Gy/10 fx/3D-CRT	2.8	3.0	Increased late toxicity with APBI (32% v 13%) and worse cosmesis with APBI
Barcelona	—	102	5.0	37.5 Gy/10 fx/3D-CRT	0	0	Lower rates of late toxicity with APBI and no difference in cosmesis
IMPORT LOW	2007-2010	2018	6.2	40 Gy/15 fx 36/15 fx (40/15 partial) 40/15 partial/3D-CRT	1.1 0.2	0.5	Similar photographic, patient, and clinical toxicity assessments, improved breast appearance, and firmness with partial breast

- Pros: more convenient
- Cons: not all patients meet eligibility criteria; cosmetic outcomes vary by trial
- Conclusions: Reasonable alternative to WBI in select patients *Courtesy of Dr. Leila Tchelebi*

ASTRO(American Society for Radiation Oncology) APBI Suitability Criteria



Patient group	Risk factor	Update
Suitability	Age	≥50 y
	Margins	No change
	T stage	Tis or T1
	DCIS	If all of the below: <ul style="list-style-type: none"> • Screen-detected • Low to intermediate nuclear grade • Size ≤2.5 cm • Resected with margins negative at ≥3 mm

APBI: Accelerated Partial Breast Irradiation

Courtesy of Dr. Leila Tchelebi



IORT

Trial	Years of Accrual	No. of Patients	F/U (years)	Radiation Dose (Gy)	Local Recurrence with WBI (%)	Local Recurrence with IORT (%)	Toxicity
ELIOT	2000-2007	1,305	12.4	21	2	11	Not collected
TARGIT-A	2000-2012	3,451 1,153 (postpathology) 2,298 (prepathology)		20	1.3 1.05 (5 year) 0.95 (5 year)	3.3 3.96 (5 year)-IORT inferior 2.11% (5 year)-noninferior Overall local recurrences (60 IORT v 24 WBI, prepathology)	Wound complications similar

- Pros: very convenient for patients, minimal/no side effects
- Cons: data shows increased LR
- Conclusions: An alternative to other tx modalities in select patients who are at low risk of local recurrence

Courtesy of Dr. Leila Tchelebi

Radiation Therapy Treatment Summary Sample



SUMMARY OF RADIATION FIELDS

Course: C1 LT BREAST @ XXX Hospital

Course: C1 LT BREAST

Treatment Site: LT BREAST

Ref. ID: Breast_L

Energy: 6X

Dose/Fx (cGy): 265

#Fx: 16 / 16

Total Dose (cGy): 4,240

Start Date: 8/11/2022

End Date: 9/3/2022

Elapsed Days: 23

SUMMARY OF RADIATION TREATMENTS: The patient was treated to the left breast using a 3D Conformal (3D CRT) and **En Face** technique. The patient tolerated treatments quite well. The patient had the expected side effects of dermatitis.

Course: C1 LT BREAST

Treatment Site: LT Brst Boost

Ref. ID: LT Brst Boost

Energy: 9E

Dose/Fx (cGy): 250

#Fx: 4 / 4

Total Dose (cGy): 1,000

Start Date: 9/4/2022

End Date: 9/9/2022

Elapsed Days: 5

Treatment Site	Ref. ID	Energy	Dose/Fx (cGy)	#Fx	Total Dose (cGy)	Start Date	End Date	Elapsed Days
LT BREAST	Breast_L	6X	265	16 / 16	4,240	8/11/2022	9/3/2022	23
LT Brst Boost	LT Brst Boost	9E	250	4 / 4	1,000	9/4/2022	9/9/2022	5



Total Dose A: Example 1

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)



Total Dose E: Example 2

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

RT Summary:

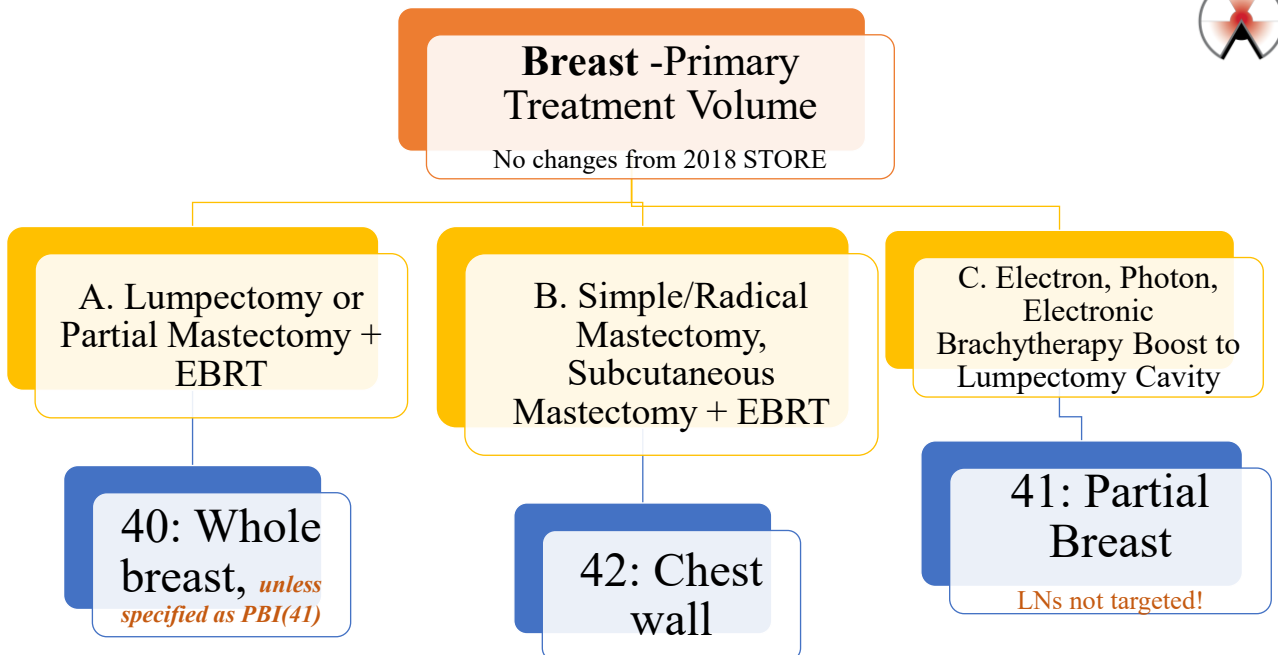
Using a 6/1 mini SAVI catheter, RT lumpectomy cavity received 34 Gy in 10 treatments, BID.

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)



PRIMARY TREATMENT VOLUME





Adjuvant/Neoadjuvant Therapy for Breast Cancer

ASCO(American Society of Clinical Oncology) Guidelines



- Patients w/ early-stage breast cancer, T1aN0, and T1bN0, HER2+ can omit neoadjuvant therapy,
- Neoadjuvant systemic therapy offered to pts w/ high-risk HER2+, or triple negative breast cancer,
- Neoadjuvant systemic therapy offered to reduce extent of surgery. Chemo with or w/o targeted therapy or endocrine therapy offered,
- Neoadjuvant chemo treatment of choice for pts w/ inflammatory breast cancer, unresectable or locally advanced dz @ time of presentation,

www.asco.org

Pre-op neoadjuvant therapy-HER2-negative NCCN Guidelines, v4.2022



- Preferred:
 - ddAC(doxorubicin/cyclophosphamide) + paclitaxel every 2 wks,
 - ddAC (doxorubicin/cyclophosphamide) + weekly paclitaxel,
 - TC (docetaxel/cyclophosphamide)
 - Olaparib(chemo), if BRCA1/2+ (can be used concurrently w/ endocrine therapy)
- High-risk triple negative breast cancer (>4 LNs or 1-3 LNs & G3, T3, or Ki-67 > or equal to 20%)
 - Pre-op pembrolizumab + carboplatin + paclitaxel followed by pre-op pembrolizumab + cyclophosphamide + doxorubicin or epirubicin, followed by adjuvant pembrolizumab.

Pre-op neoadjuvant therapy-HER2-positive NCCN Guidelines, v4.2022



- Preferred:
 - Paclitaxel + trastuzumab (low risk pts),
 - TCH (docetaxel/carboplatin/trastuzumab),
 - TCHP (docetaxel/carboplatin/trastuzumab/pertuzumab)
- Other recommendations:
 - AC followed by docetaxel + trastuzumab,
 - AC followed by docetaxel + trastuzumab + pertuzumab.



PEMBROLIZUMAB

ASCO Guidelines

- T1c-N1-2, or T2-4N0(Stage II or III), early-stage triple negative,
- 200 mg every 3 wks or 40 mg every 6 wks,
- Combined w/ neoadjuvant chemo, followed by adjuvant pembrolizumab post surgery,
- Can be given concurrent with or post RT completion,
- Use of pembrolizumab in combination w/ either capecitabine or Olaparib unsupported by clinical data.

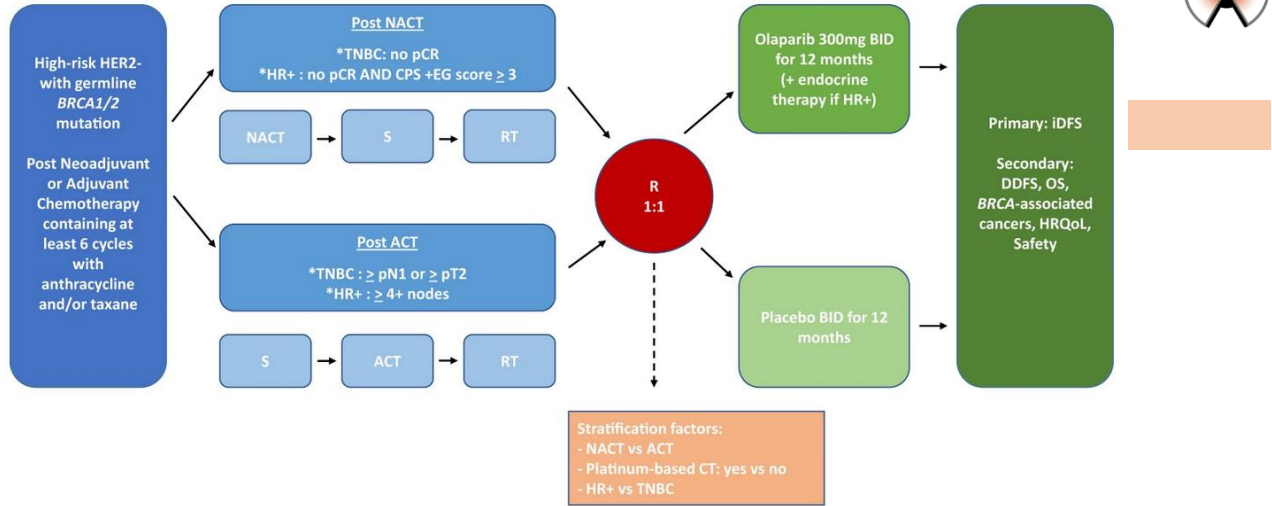


PARP Inhibitors-OlympiA Clinical Trial

N ENGL J MED 2021; 384: 2394-405

- Phase III international (23 countries) randomized trial of adjuvant **Olaparib** post neoadjuvant chemo for patients who are BRCA1/2+, high-risk HER2 negative, early breast cancer.
- BRCA1/2+ pts have a high risk of recurrence despite treatment,
- Olaparib is a PARP (poly adenosine diphosphate-ribose polymerase) inhibitor (PARPi),
- PARP is a type of enzyme involved in DNA damage repair in cells. PARP inhibitors selectively prevent cancerous cells from repairing DNA damage, resulting in cell death.

From: [PARP inhibition in breast cancer: progress made and future hopes](#)



OlympiA Clinical Trial

NPJ Breast Cancer 2022, 8:47

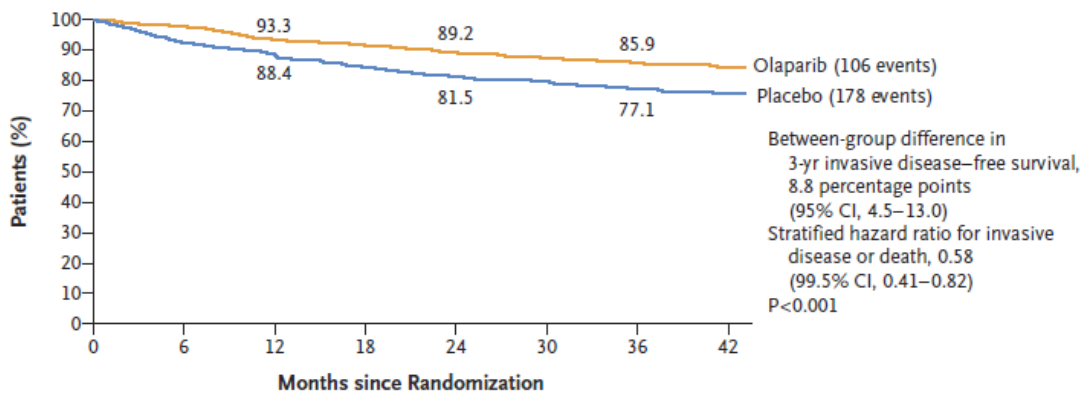
NACT: Neoadjuvant chemotherapy
ACT: Adjuvant chemotherapy
S: Surgery
RT: Radiation Therapy
HRQoL: Health-related quality of life

BID: Twice a day
iDFS: Invasive disease-free survival
DDFS: Distant disease-free survival
OS: Overall survival

PARP Inhibitors-OlympiA Clinical Trial

N ENGL J MED 2021; 384: 2394-405

A Invasive Disease-free Survival



No. at Risk

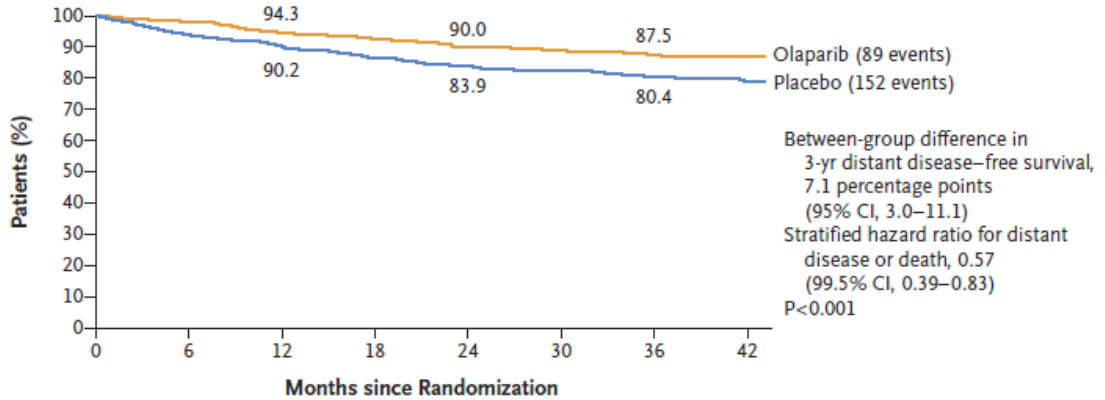
Olaparib	921	820	737	607	477	361	276	183
Placebo	915	807	732	585	452	353	256	173



PARP Inhibitors-OlympiA Clinical Trial

N ENGL J MED 2021; 384: 2394-405

B Distant Disease-free Survival



No. at Risk

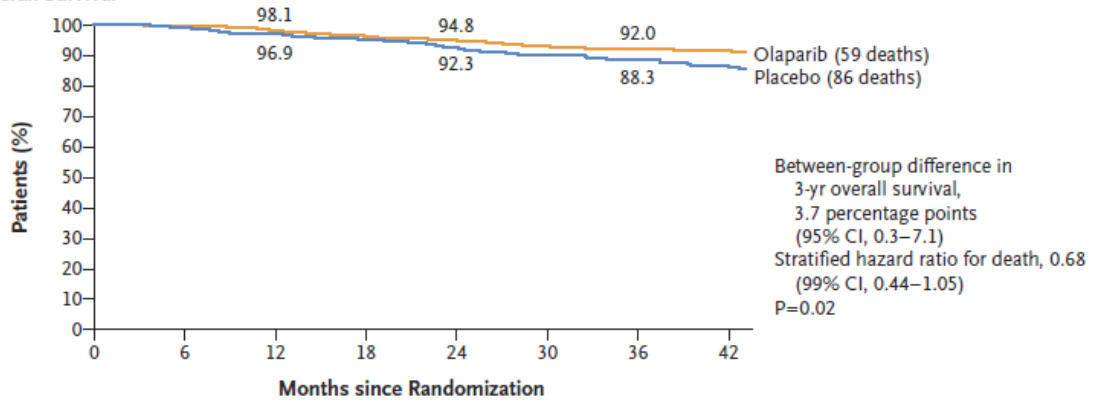
Olaparib	921	823	744	612	479	364	279	187
Placebo	915	817	742	594	461	359	263	179



PARP Inhibitors-OlympiA Clinical Trial

N ENGL J MED 2021; 384: 2394-405

C Overall Survival



No. at Risk

Olaparib	921	856	801	659	531	400	310	205
Placebo	915	865	801	659	516	397	292	199



PARP Inhibitors-EMBRACA Clinical Trial

N ENGL J MED 2018; 379: 753-63

- Phase III international randomized trial of adjuvant **talazoparib** vs. standard of care + single agent chemo of MDs' choice (capecitabine, eribulin, gemcitabine, or vinorelbine) for patients who are BRCA1/2+, high-risk HER2 negative, locally advanced breast cancer or metastatic breast cancer,
- Neoadjuvant therapy permitted; pt has to be dz-free for at least 6 months after last dose,
- Pts excluded if they had dz progression while on platinum-based chemo,
- Pts w/ CNS mets eligible,

PARP Inhibitors-EMBRACA Clinical Trial

N ENGL J MED 2018; 379: 753-63
Annals of Oncology 2020, v21: 1526-1535



Table 1. Baseline Characteristics of the Patients (Intention-to-Treat Population).*

Characteristic	Talazoparib Group (N=287)	Standard-Therapy Group (N=144)
Age — yr		
Median	45	50
Range	27.0–84.0	24.0–88.0
Age <50 yr — no. (%)	182 (63.4)	67 (46.5)
Female sex — %	98.6	97.9
ECOG performance status score — %†		
0	53.3	58.3
1	44.3	39.6
2	2.1	1.4
Breast cancer stage — no. (%)‡		
Locally advanced	15 (5.2)	9 (6.2)
Metastatic	271 (94.4)	135 (93.8)
Measurable disease assessed by investigator — no. (%)	219 (76.3)	114 (79.2)
History of CNS metastases — no. (%)	43 (15.0)	20 (13.9)
Visceral disease — no. (%)	200 (69.7)	103 (71.5)
Hormone-receptor status — no. (%)		
Triple-negative	130 (45.3)	60 (41.7)
Hormone-receptor-positive	157 (54.7)	84 (58.3)

PARP Inhibitors-EMBRACA Clinical Trial

N ENGL J MED 2018; 379: 753-63
Annals of Oncology 2020, v21: 1526-1535



Highlights

- In *BRCA1/2*-mutated advanced breast cancer, talazoparib did not significantly improve overall survival (OS) versus chemotherapy.
- OS was generally consistent across subgroups including by prior platinum, hormone-receptor status, or line of treatment.
- Most patients received subsequent systemic treatments, which may have confounded the survival outcome.
- Toxicities were managed by supportive care medication/dose modifications; safety was consistent with previous observations.
- Extended follow-up of patient-reported outcomes continued to favor talazoparib over chemotherapy.



Clinical Cases



Case 1

- 73 y/o female who presented w/ RT breast cancer and underwent a lumpectomy w/ SLN dissection w/ negative margins followed by RT.

RT completion Summary:

Site	Ref. ID	Energy	Dose/Fx (cGy)	#Fx	Total Dose (cGy)	Start Date	End Date	Elapsed Days
Partial Brst_RT	Partial Brst_RT	6X	600	5 / 5	3,000	7/25/2022	8/3/2022	9

SUMMARY OF RADIATION TREATMENTS: The patient was treated to the right breast using a **3D Conformal (3D CRT) technique**. The patient tolerated treatments quite well.

Case 1

Seg	#	Field	Code/Definition
Summary	1	Rad/Surg Sequence	3 RT given after surgery
	2	Reason No Rad	0 Radiation was admin..
	3	Location of Rad	1 All RT at this facility
	4	Date RT Started/Flag	07/25/2022
	5	Date RT Ended/Flag	08/03/2022
	6	Number of Phases of RT	01
	7	RT Discontinued Early	01 Radiation completed
	8	Total Dose	3000
Phase 1	9	Primary Treatment Volume	41 Partial breast
	10	Rad to Draining LNs	00 No RT to draining lymph nodes
	11	Treatment Modality	02 Photons
	12	Planning Technique	04 3D-Conformal
	13	Dose per Fraction	00600
	14	Number of Fractions	005
	15	Phase I Total Dose	03000
Phase 2	16	Primary Treatment Volume	00
	17	Rad to Draining LNs	
	18	Treatment Modality	
	19	Planning Technique	
	20	Dose per Fraction	
	21	Number of Fractions	
	22	Phase II Total Dose	
Phase 3	23	Primary Treatment Volume	
	24	Rad to Draining LNs	
	25	Treatment Modality	
	26	Planning Technique	
	27	Dose per Fraction	
	28	Number of Fractions	
	29	Phase III Total Dose	

Case 1 Rationale:

- **#9:** Treatment summary clearly specifies partial breast volume,
- **#10:** Lymphatics not mentioned in treatment summary,
- **#11:** Beam energy of 6X denotes photon therapy was used,
- **#12:** Planning technique of 3D-Conformal specified in RT summary.

Note: Vast majority of whole/partial breast tangential or prone fields are treated w/ 3D-Conformal plans.





Case 1 Notepad Text

7/25/22-8/3/22 @ YYY Hospital: RT partial breast, 6X/3D, 6 Gy x 5 fx= 30 Gy in 9 days.



Case 2

- 69 y/o w/f who presented w/ palpable LT breast mass. Underwent partial mastectomy.

RT completion Summary:

Treatment Site	Ref. ID	Energy	Dose/Fx (cGy)	#Fx	Total Dose (cGy)	Start Date	End Date	Elapsed Days
LT BREAST	Breast_L	6X	265	16 / 16	4,240	8/11/2022	9/3/2022	23
LT Brst Boost	LT Brst Boost	9E	250	4 / 4	1,000	9/4/2022	9/9/2022	5

SUMMARY OF RADIATION TREATMENTS: The patient was treated to the left breast using a 3D Conformal (3D CRT) and **En Face** technique. The patient tolerated treatments quite well. The patient had the expected side effects of dermatitis.

Case 2

Seg	#	Field	Code/Definition
Summary	1	Rad/Surg Sequence	3 RT given after surgery
	2	Reason No Rad	0 Radiation was admin..
	3	Location of Rad	1 All RT at this facility
	4	Date RT Started/Flag	08/11/2022
	5	Date RT Ended/Flag	09/09/2022
	6	Number of Phases of RT	02
	7	RT Discontinued Early	01 Radiation completed
	8	Total Dose	5240
Phase 1	9	Primary Treatment Volume	40 Whole breast
	10	Rad to Draining LNs	00 No RT to draining lymph nodes
	11	Treatment Modality	02 Photons
	12	Planning Technique	04 3D-Conformal
	13	Dose per Fraction	00265
	14	Number of Fractions	016
Phase 2	15	Phase I Total Dose	04240
	16	Primary Treatment Volume	41 Partial breast
	17	Rad to Draining LNs	00 No RT to draining lymph nodes
	18	Treatment Modality	04 Electrons
	19	Planning Technique	04 3D-Conformal
	20	Dose per Fraction	00250
	21	Number of Fractions	004
Phase 3	22	Phase II Total Dose	01000
	23	Primary Treatment Volume	00
	24	Rad to Draining LNs	
	25	Treatment Modality	
	26	Planning Technique	
	27	Dose per Fraction	
	28	Number of Fractions	
	29	Phase III Total Dose	

Case 2 Rationale:



- **#9:** Treatment summary does not specify partial breast volume,
- **#10:** Lymphatics not mentioned in treatment summary,
- **#11:** Beam energy of 6X denotes photon therapy was used,
- **#12:** Planning technique of 3D-Conformal specified in RT summary.
- **#16:** A breast boost is always to **partial** breast volume; **does not** include lymphatics,
- **#18:** Beam energy of 9E and “En Face” description on RT summary indicative of electron boost.

Case 2 Notepad Text



8/11/22-9/9/22 @ XXX Hospital: 1. LT breast, 6X/3D, 2.65 Gy x 16 fx= 42.4 Gy. 2. eBoost, 9E/3D, 2.5 Gy x 4 fx= 10 Gy. Total dose= 52.4 Gy.



Case 3

- 51-yr-old female who presented w/ dimpling of RT breast. Underwent RT skin-sparing mastectomy.

RT completion Summary:

Treatment Site	Ref. ID	Energy	Dose/Fx (cGy)	#Fx	Total Dose (cGy)	Start Date	End Date	Elapsed Days
RT CW	CW_R	6X	180	28/28	5040	12/12/2021	01/22/2022	41
RT S'clav	RT Sclav boost	6X	180	28	5040	12/12/2021	01/22/2022	41

SUMMARY OF RADIATION TREATMENTS: The patient was treated to the right chest wall and S'clav lymph nodes using an IMRT plan. The patient completed treatment without any issues.

Case 3a

Seg	#	Field	Code/Definition
Summary	1	Rad/Surg Sequence	3 RT given after surgery
	2	Reason No Rad	0 Radiation was admin..
	3	Location of Rad	1 All RT at this facility
	4	Date RT Started/Flag	12/12/2021
	5	Date RT Ended/Flag	01/22/2022
	6	Number of Phases of RT	01
	7	RT Discontinued Early	01 Radiation completed
	8	Total Dose	5040
Phase 1	9	Primary Treatment Volume	42 Chest wall
	10	Rad to Draining LNs	04 Breast/Chest wall lymph nodes
	11	Treatment Modality	02 Photons
	12	Planning Technique	05 IMRT
	13	Dose per Fraction	00180
	14	Number of Fractions	028
	15	Phase I Total Dose	05040
Phase 2	16	Primary Treatment Volume	00
	17	Rad to Draining LNs	
	18	Treatment Modality	
	19	Planning Technique	
	20	Dose per Fraction	
	21	Number of Fractions	
	22	Phase II Total Dose	
Phase 3	23	Primary Treatment Volume	
	24	Rad to Draining LNs	
	25	Treatment Modality	
	26	Planning Technique	
	27	Dose per Fraction	
	28	Number of Fractions	
	29	Phase III Total Dose	

Case 3a (one phase)Rationale:



You can abstract this case as either a single phase (preferred), or as two phases.

- **#08:** Total dose should be the same, regardless of whether abstracted as a one or two phase case,
- **#9:** Chest wall is specified,
- **#10:** Supraclavicular LNs mentioned in treatment summary,
- **#11:** Beam energy of 6X denotes photon therapy was used,
- **#12:** Planning technique of IMRT specified in RT summary.

Note: You are more likely to see IMRT planning technique when the chest wall is irradiated post mastectomy.

Case 3b

Seg	#	Field	Code/Definition
Summary	1	Rad/Surg Sequence	3 RT given after surgery
	2	Reason No Rad	0 Radiation was admin..
	3	Location of Rad	1 All RT at this facility
	4	Date RT Started/Flag	12/12/2021
	5	Date RT Ended/Flag	01/22/2022
	6	Number of Phases of RT	02
	7	RT Discontinued Early	01 Radiation completed
	8	Total Dose	5040
Phase 1	9	Primary Treatment Volume	42 Chest wall
	10	Rad to Draining LNs	00 No RT to draining lymph nodes
	11	Treatment Modality	02 Photons
	12	Planning Technique	05 IMRT
	13	Dose per Fraction	00180
	14	Number of Fractions	028
	15	Phase I Total Dose	05040
Phase 2	16	Primary Treatment Volume	04 Breast/Chest wall lymph nodes
	17	Rad to Draining LNs	88 NA Primary RT volume is LNs
	18	Treatment Modality	02 Photons
	19	Planning Technique	05 IMRT
	20	Dose per Fraction	00180
	21	Number of Fractions	028
	22	Phase II Total Dose	05040
Phase 3	23	Primary Treatment Volume	00
	24	Rad to Draining LNs	
	25	Treatment Modality	
	26	Planning Technique	
	27	Dose per Fraction	
	28	Number of Fractions	
	29	Phase III Total Dose	

Case 3b (two phases)Rationale:



You can abstract this case as either a **single** phase (preferred), or as **two** phases.

- **#08:** Total dose should be the same, regardless of whether abstracted as a one or two phase case,
- **#9:** Chest wall is specified,
- **#10:** Should be coded to 00 when abstracting as two phases,
- **#12:** Planning technique of IMRT specified in RT summary.
- **#16:** S'clav LNs,
- **#17:** Lymph nodes are primary treatment volume in #16.

Case 3 Notepad Text

1 Phase(preferred):

12/12/21-1/22/22 @ YYY Hospital: RT CW/Sclav, 6X/IMRT, 1.8 Gy x 28 fx= 50.4 Gy in 41 days.

2 Phases:

12/12/21-1/22/22 @ YYY Hospital: 1. RT CW, 6X/IMRT, 1.8 Gy x 28 fx= 50.4 Gy. 2. Sclav, 6X/IMRT, 1.8 Gy x 28 fx= 50.4 Gy. Elapsed days= 41.



Case 4

- 61-yr-old female who presented w/ screen-detected right breast cancer. Underwent RT breast lumpectomy with HDR Electronic Brachytherapy IORT.

RT completion Summary:

*Physics staff performed **XOFT** machine/source quality assurance procedures. The surgical cavity was prepared by the breast surgery team. A cavity evaluation device was placed in the lumpectomy cavity, filled with saline and evaluated with ultrasound. Based on this evaluation a 4-5 cm XOFT Balloon applicator was selected. The balloon was tested and then paced in the cavity and filled with 50 cc of saline. Ultrasound was performed and demonstrated excellent tissue conformance of the balloon to the cavity, without air or fluid gaps, and a minimum skin-to-surface distance of 1.2 cm. The treatment plan was loaded into the system from the thumb drive.*



Case 4...

- 61-yr-old female who presented w/ screen-detected right breast cancer. Underwent RT breast lumpectomy with HDR Electronic Brachytherapy IORT.

RT completion Summary:

*Applicator was attached to the **XOFT Electronic Brachytherapy** controller and the source was attached to the source positioning mechanism.*

The Flexi-Shield was placed over the are of the balloon, on top of the pt. Simple simulation was performed by deploying inactive radiation source into the balloon catheter and through all dwell positions. Once test passed, OR was cleared and an HDR IORT of 20 Gy was delivered via the 50 kV x-ray electronic brachytherapy source.



XOFT AXXENT



X-Ray Source



Balloon Applicators



Axxent Controller

Case 4

Seg	#	Field	Code/Definition
Summary	1	Rad/Surg Sequence	5 Intraoperative RT
	2	Reason No Rad	0 Radiation was admin..
	3	Location of Rad	1 All RT at this facility
	4	Date RT Started/Flag	02/14/2022
	5	Date RT Ended/Flag	02/14/2022
	6	Number of Phases of RT	01
	7	RT Discontinued Early	01 Radiation completed
	8	Total Dose	2000
Phase 1	9	Primary Treatment Volume	41 Partial breast
	10	Rad to Draining LNs	00 No RT to draining lymph nodes
	11	Treatment Modality	02 Photons
	12	Planning Technique	02 Low energy x-ray/photon
	13	Dose per Fraction	002000
	14	Number of Fractions	001
	15	Phase I Total Dose	02000
Phase 2	16	Primary Treatment Volume	00
	17	Rad to Draining LNs	
	18	Treatment Modality	
	19	Planning Technique	
	20	Dose per Fraction	
	21	Number of Fractions	
	22	Phase II Total Dose	
Phase 3	23	Primary Treatment Volume	
	24	Rad to Draining LNs	
	25	Treatment Modality	
	26	Planning Technique	
	27	Dose per Fraction	
	28	Number of Fractions	
	29	Phase III Total Dose	



Case 4 Rationale:

- **#9:** IORT targets the partial breast,
- **#10:** Lymphatics not targeted during IORT treatments,
- **#11:** XOFT AXXENT uses low energy **photons**,
- **#12:** Planning technique of should be 02.

Note: Modality code 12, Brachytherapy, electronic???

Modality	
Code	Label
00	No radiation treatment
01	External beam, NOS
02	External beam, photons
03	External beam, protons
04	External beam, electrons
05	External beam, neutrons
06	External beam, carbon ions
07	Brachytherapy, NOS
08	Brachytherapy, intracavitary, LDR
09	Brachytherapy, intracavitary, HDR
10	Brachytherapy, Interstitial, LDR
11	Brachytherapy, Interstitial, HDR
12	Brachytherapy, electronic

02: External beam, photons

Zeiss Intrabeam
XOFT Axxent
Esteya (skin ca)

Small-scale Linacs.
They **do not** use radioactive isotopes (seeds).
Planning Technique: 02, Low energy x-ray/photon therapy

PLANNING TECHNIQUE	
Code	Label
00	No radiation treatment
01	External beam, NOS
02	Low energy x-ray/photon therapy
03	2-D therapy
04	Conformal or 3-D conformal therapy
05	Intensity modulated therapy

Case 4 Notepad Text

2/14/22 @ YYY Hospital: RT breast IORT, via XOFT Axxent electronic brachytherapy @ 50 kV. Single fx = 20 Gy.

Case 3a

Seg	#	Field	Code/Definition
Summary	1	Rad/Surg Sequence	3 RT given after surgery
	2	Reason No Rad	0 Radiation was admin..
	3	Location of Rad	1 All RT at this facility
	4	Date RT Started/Flag	12/12/2021
	5	Date RT Ended/Flag	01/22/2022
	6	Number of Phases of RT	02
	7	RT Discontinued Early	01 Radiation completed
	8	Total Dose	5040
Phase 1	9	Primary Treatment Volume	42 Chest wall
	10	Rad to Draining LNs	04 Breast/Chest wall lymph nodes
	11	Treatment Modality	02 Photons
	12	Planning Technique	05 IMRT
	13	Dose per Fraction	00180
	14	Number of Fractions	028
15	Phase I Total Dose	05040	
Phase 2	16	Primary Treatment Volume	00
	17	Rad to Draining LNs	00
	18	Treatment Modality	00
	19	Planning Technique	00
	20	Dose per Fraction	00
	21	Number of Fractions	00
	22	Phase II Total Dose	00
Phase 3	23	Primary Treatment Volume	00
	24	Rad to Draining LNs	00
	25	Treatment Modality	00
	26	Planning Technique	00
	27	Dose per Fraction	00
	28	Number of Fractions	00
	29	Phase III Total Dose	00



Subsequent phases

- No need to populate all other fields with zeroes.
- Only requirement is to populate fields of treated phase(s).
- Add 00 to Primary Treatment Volume of next untreated phase only (red circle).

Resources

- “Understanding Radiation Therapy: A primer for tumor registrars”. *Journal of Registry Management* 2019, Vol46, number 3
- “Online Adaptive Radiation Therapy” *Journal of Registry Management* 2018, Vol45, number 2
- <https://cancerbulletin.facs.org/forums/>
- <https://www.asco.org/practice-patients/guidelines/breast-cancer#/150037>
- https://journals.lww.com/oncology-times/fulltext/2018/04200/astro_issues_updated_clinical_guideline_for_whole.14.aspx



CTR Guide to Coding Radiation Therapy Treatment in the STORE

Version 4.0 February 2022

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Shane &
Lily



Ribs
Muscle
Fatty tissue
Lobe
Ducts
Areola
Nipple
Lobules

Questions?

13

13

Ribs
Muscle
Fatty tissue
Lobe
Ducts
Areola
Nipple
Lobules

Case Scenarios

14

14

Scenario 1 Surgery

Diagnostic Staging Procedure	02
Date of First Course Treatment	7/11/22
Surgery of Primary Site (03-2022)	22
Surg Breast	B200
Recon Breast	A000
Scope of Regional Lymph Nodes	2
Sentinel Lymph Nodes Positive	00
Sentinel Lymph Nodes Examined	03
Regional Nodes Positive	00
Regional Nodes Examined	03
Surgical Procedure/Other Site	0

15

15

Scenario 1 Systemic

Date Systemic Therapy Started	8/15/22
Chemotherapy	00
Hormone Therapy	01
Immunotherapy	00
Hematologic Transplant and Endocrine Procedures	0
Systemic/Surgery Sequence	3

16

16

Scenario 2 Surgery

Diagnostic Staging Procedure	02
Date of First Course Treatment	4/8/22
Surgery of Primary Site (03-2022)	20
Surg Breast	B200
Recon Breast	A000
Scope of Regional Lymph Nodes	2
Sentinel Lymph Nodes Positive	00
Sentinel Lymph Nodes Examined	02
Regional Nodes Positive	00
Regional Nodes Examined	02
Surgical Procedure/Other Site	0

17

17

Scenario 2 Systemic

Date Systemic Therapy Started	4/22/22
Chemotherapy	03
Hormone Therapy	87
Immunotherapy	00
Hematologic Transplant and Endocrine Procedures	0
Systemic/Surgery Sequence	3

18

18

Scenario 3 Surgery

Diagnostic Staging Procedure	02
Date of First Course Treatment	4/9/21
Surgery of Primary Site (03-2022)	30
Surg Breast	Blank (if dx 2022 B410)
Recon Breast	Blank (if dx 2022 A100)
Scope of Regional Lymph Nodes	2
Sentinel Lymph Nodes Positive	01
Sentinel Lymph Nodes Examined	04
Regional Nodes Positive	01
Regional Nodes Examined	04
Surgical Procedure/Other Site	0

19

19

Scenario 3 Systemic

Date Systemic Therapy Started	4/9/21
Chemotherapy	03
Hormone Therapy	01
Immunotherapy	00
Hematologic Transplant and Endocrine Procedures	0
Systemic/Surgery Sequence	4

20

20

Scenario 4

Diagnostic Staging Procedure	02
Date of First Course Treatment	2/14/22
Surgery of Primary Site (03-2022)	22
Surg Breast	A200
Recon Breast	A000
Scope of Regional Lymph Nodes	2
Sentinel Lymph Nodes Positive	00
Sentinel Lymph Nodes Examined	03
Regional Nodes Positive	00
Regional Nodes Examined	03
Surgical Procedure/Other Site	0

21

21

Scenario 4 Systemic

Date Systemic Therapy Started	3/8/22
Chemotherapy	00
Hormone Therapy	01
Immunotherapy	00
Hematologic Transplant and Endocrine Procedures	0
Systemic/Surgery Sequence	3

22

22

Ribs
Muscle
Fatty tissue
Lobe
Ducts
Areola
Nipple
Lobules

Questions?

23

23

Fabulous Prizes

24

24

CE Certificate Quiz/Survey

CE Phrase

Link

- <https://survey.alchemer.com/s3/7032768/Breast-2022-Part-1>

25

Coming UP...

Breast 2022 Part 2

- Guest Host: Denise Harrison, CTR
- 11/10/2022

Esophagus 2022

- Guest Host: Wilson Apollo, CTR
- 12/01/2022

26

Thank you!

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27