



*National Imaging Associates, Inc.	
Clinical guidelines: BREAST CANCER	Original Date: March 2011
Radiation Oncology	Last Revised Date: May 2023
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GENERAL INFORMATION

- *It is an expectation that all patients receive care/services from a licensed clinician. All appropriate supporting documentation, including recent pertinent office visit notes, laboratory data, and results of any special testing must be provided. If applicable: All prior relevant imaging results and the reason that alternative imaging cannot be performed must be included in the documentation submitted.*
- *Where a specific clinical indication is not directly addressed in this guideline, medical necessity determination will be made based on widely accepted standard of care criteria. These criteria are supported by evidence-based or peer-reviewed sources such as medical literature, societal guidelines and state/national recommendations.*

INDICATIONS FOR RADIATION THERAPY AND TREATMENT OPTIONS

This guideline outlines several methods suitable for the employment of radiation therapy in conjunction with breast cancer treatment. These include the use of three-dimensional conformal radiation therapy (3D-CRT), intensity-modulated radiation therapy (IMRT), image-guided radiation therapy (IGRT) and internal radiation (brachytherapy). IMRT is not indicated as a standard treatment option for breast cancer but may be indicated for selected cases of breast cancer with close proximity to critical structures. Most external beam treatments are delivered using a high energy linear accelerator. Brachytherapy is generally delivered using temporary HDR sources such as 192-Iridium (192-Ir) or Cesium-137 (137-Cs).

Whole Breast Radiation^{1,2, 3,4}

Three-dimensional conformal radiation therapy (3D-CRT) is the appropriate technique for treatment of the whole breast following breast conserving surgery (lumpectomy, breast conservation surgery). Electron beam or photon beam are the most commonly used techniques for delivering boost radiotherapy. Several randomized trials have confirmed the efficacy of a hypofractionated regimen in the adjuvant treatment of breast cancer.

Hypofractionated Dosage Guidelines

The use of up to 16 fractions of 3DCRT followed by a boost of 4-8 fractions for patients at higher risk of recurrence is considered medically necessary.

Ultra-hypofractionated Dosage Guidelines^{1,5}

28.5 Gy delivered as 5 fractions, may be considered in selected patients aged ≥ 50 years following breast conservation surgery with pTis/T1/T2/N0 tumors. The optimal fractionation for the delivery of a boost is not known with this regimen⁵

Other treatment regimens require review and clinical documentation that supports medical necessity.

Partial Breast Irradiation^{1,6-11}

Accelerated partial breast irradiation (APBI) may be considered as the sole form of radiation therapy, in lieu of whole breast radiation following lumpectomy for selected cases. Patients with a small tumor, clear surgical margins after lumpectomy, and no lymph nodes containing cancer are typically eligible for APBI. APBI is considered appropriate for patients who meet all of the following criteria (suitable group):

- Age 50 or older
- Invasive ductal carcinoma or low grade-intermediate grade ductal carcinoma in situ (DCIS)
- Lymph nodes negative
- No or minimal lymphovascular invasion
- Positive estrogen receptor
- Negative surgical margins (more than or equal to 2mm for invasive ductal carcinoma, more than or equal to 3mm for DCIS)
- Tumor size less than or equal to 2cm for invasive ductal carcinoma and less than or equal to 2.5cm for ductal carcinoma In Situ
- Clinically or microscopically unifocal
- Absence of BRCA in 1/2 mutation, if applicable

Dosage Guidelines¹

- Appropriate fractionation schemes for APBI are:
 - 30 Gy in 5 fractions once a day, preferred^{7,8}
 - 40 Gy in 15 fractions once a day⁹
 - 34 Gy in 10 BID fractions balloon/interstitial brachytherapy¹⁰
 - 38.5 Gy in 10 BID fractions¹¹

Chest Wall Radiation¹

Three-dimensional conformal radiation therapy (3D-CRT) is the appropriate technique for treatment of the chest wall following mastectomy. Chest wall scar boost may be delivered with or without bolus using electrons or photons.

Dosage Guidelines

- 45-50.4 Gy up to 28 fractions with boost 59-66.4 Gy up to 37 fractions

Other Considerations

- Re-irradiation following local or regional recurrence after prior mastectomy and prior breast, or chest wall radiation may be appropriate.
- For inflammatory breast cancer, whole breast or chest wall radiation, consider nodal radiation with or without chest wall boost.

Dosage Guidelines

- 45-50.4 Gy up to 28 fractions with boost 59-66.4 Gy up to 37 fractions.

Standard radiation fractionation consists of 1.8 Gy to 2.0 Gy per day.

TREATMENT OPTIONS (WILL BE REVIEWED ON A CASE-BY-CASE BASIS)

Intensity modulated radiation therapy (IMRT)^{1,12}

IMRT is not indicated as a standard treatment option and should not be used routinely for the delivery of radiation therapy for breast cancer. IMRT is strictly defined by the utilization of inverse planning modulation techniques. IMRT may be appropriate for limited circumstances in which radiation therapy is indicated and 3D conformal radiation therapy (3D-CRT) techniques cannot adequately deliver the radiation prescription without exceeding normal tissue radiation tolerance, the delivery is anticipated to contribute to potential late toxicity or tumor volume dose heterogeneity is such that unacceptable hot or cold spots are created. If IMRT is utilized, techniques to account for respiratory motion should be performed.

Clinical rationale and documentation for performing IMRT rather than 2D or 3D-CRT treatment planning and delivery will need to:

- Demonstrate how 3D-CRT isodose planning cannot produce a satisfactory treatment plan (as stated above) via the use of a patient-specific dose volume histograms and isodose plans. 3D-CRT techniques such as step-and-shoot or field-in-field should be considered for the comparison.
- Confirm the IMRT requested will be inversely planned (forward plans or 'field-in-field' plans are not considered IMRT).
- Provide tissue constraints for both the target and affected critical structures.
- Upon review, IMRT can be approved for accelerated partial breast irradiation using 30 Gy in 5 fractions once a day regimen.^{7,8} Comparative 3D-CRT vs. IMRT plans are not required.

Whole Breast Irradiation (WBI)^{1,2}

The use of up to 16 fractions of 3DCRT followed by a boost of 4-8 fractions for patients at higher risk of recurrence is considered medically necessary. Several randomized trials have confirmed the efficacy of a hypofractionated regimen in the adjuvant treatment of breast cancer. Other treatment regimens require review and clinical documentation that supports medical necessity.

The use of up to 28 fractions of 3DCRT followed up with a boost of 4-8 fractions may be medically necessary if any of the following criteria are met:

- Reirradiation
- Lymph node involvement requiring treatment the supraclavicular or internal mammary nodal regions
- Concurrent chemotherapy will be administered (does not include trastuzumab or endocrine therapy)
- Collagen vascular disease
- Breast augmentation/reconstruction
- Treatment will be delivered with 3D conformal radiotherapy and the treatment plan results in dose inhomogeneity of greater than 7% in the central axis (for example, if the plan is normalized to 95%, the maximum dose is greater than 120%)

Brachytherapy

Interstitial brachytherapy boost treatment requires a peer review and documentation that improvement in dose delivery to the boost target cannot be delivered with external beam therapy. Other emerging techniques such as Non-invasive Image Guided Breast Brachytherapy (NIIGBB) techniques are being investigated and are not considered a medically necessary treatment option for the treatment of breast cancer.

Proton Beam Radiation Therapy

Proton beam is not an approved treatment option for breast cancer. There are limited clinical studies comparing proton beam therapy to 3-D conformal radiation or IMRT. Overall, studies have not shown clinical outcomes to be superior to conventional radiation therapy.

Intraoperative radiation therapy (IORT)^{6,13-15}

- Electron beam IORT should be restricted to women with invasive cancer considered “suitable” for partial breast irradiation
- Since there is no data on the use of IORT with DCIS, the task force recommended that its use be limited to patients with invasive breast cancer
- Single Fraction Electron-beam IORT is considered medically necessary in accordance with ASTRO guidelines if the following criteria are met (suitable group):
 - Individual is 45 years of age or older with invasive cancer
 - T Stage: T1 (tumor up to 3.5 cm)
 - Clinically node negative
 - Negative surgical margins

- The use of electronic brachytherapy for IORT (such as Intrabeam, Xofigo and Papillon systems) is considered experimental, investigational, and/or unproven.

THE FOLLOWING APPLIES TO CMS (MEDICARE) MEMBERS ONLY

For Proton Beam and Stereotactic Radiotherapy, refer to Local Coverage Determination (LCD), if applicable.

BACKGROUND

Breast cancer is the second most commonly diagnosed cancer among women, after skin cancer, and it accounts for nearly 25% of cancer diagnoses in U.S. women. After a breast cancer diagnosis is made, it is followed by a staging evaluation to determine extent of disease (local, regional, or metastatic) and prognostic findings. Importance is placed on tumor size, lymph node involvement (sentinel node), the histopathological interpretation, margins of resection, and hormonal and growth-factor receptor status. Treatment for breast cancer may consist of one of several mastectomy options or breast-conserving surgery and radiation therapy.

Radiation therapy is used to treat the breast and lymph node bearing areas after partial mastectomy or lumpectomy. Since breast cancers are relatively responsive to moderate doses of radiation therapy following tumor excision, treatment for cure may be achieved by external beam techniques or by partial breast irradiation techniques.

The methods suitable for delivering breast radiation therapy have been established through clinical trials providing strong evidence in support of radiation therapy as an effective breast cancer treatment. The traditional approach utilizes tangential radiation fields to the breast and chest wall; based on the clinical and pathological factors, this may be followed by boost to the site of excision (tumor bed). The axilla and supra-clavicular regions also may be included in a separate field based on analysis of prognostic risk factors. Improvements in technology, the observation that local tumor recurrence is most frequently observed near the site of excision, and the desire to limit the extent of radiation have led to restriction of the radiation to the tumor bed (partial breast irradiation) for selected cases.

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POLICY HISTORY

Date	Summary
May 2023	<p>Clarified/updated:</p> <p>Intraoperative radiation therapy (IORT)</p> <ul style="list-style-type: none"> • Electron beam IORT should be restricted to women with invasive cancer considered “suitable” for partial breast irradiation • Since there is no data on the use of IORT with DCIS, the task force recommended that its use be limited to patients with invasive breast cancer • Single Fraction Electron-beam IORT is considered medically necessary in accordance with ASTRO guidelines if the following criteria are met (suitable group): <ul style="list-style-type: none"> ○ Individual is 45 years of age or older with invasive cancer ○ T Stage: T1 (tumor up to 3.5 cm) ○ Clinically node negative ○ Negative surgical margins • Updated references • Deleted Additional Resources • Removed “physician review” language
January 2022	<p>Whole Breast Radiation:</p> <ul style="list-style-type: none"> • Added ultra-hypofractionated dosage guidelines <p>Partial Breast Irradiation:</p> <ul style="list-style-type: none"> • Updated dosage guidelines • Updated criteria for indications for patients (Suitable Group): <ul style="list-style-type: none"> ○ Removed No use of adjuvant chemotherapy ○ Added Invasive Ductal Carcinoma or Low Grade-Intermediate Grade Ductal Carcinoma in Situ (DCIS) ○ Added No or minimal lymphovascular invasion ○ Added Positive Estrogen Receptor ○ Clarified Negative surgical margins by adding “(more than or equal to 2mm for Invasive Ductal Carcinoma, more than or equal to 3mm for DCIS)” ○ Clarified tumor size (less than or equal to 2cm for Invasive Ductal Carcinoma and less than or equal to 2.5cm for Ductal Carcinoma In Situ) <p>Intensity modulated radiation therapy (IMRT)</p> <ul style="list-style-type: none"> • Added “Upon physician review, IMRT can be approved for accelerated partial breast irradiation using 30Gy in 5 fractions once a day regimen. Comparative 3D-CRT vs. IMRT plans are not required.”



	<p>Intraoperative radiation therapy (IORT)</p> <ul style="list-style-type: none">• Changed to “Individual is 45 years of age or older with invasive cancer” (previously was 50 years of age or older with invasive cancer)• Clarified TStage: Tis or T1 by adding “(tumor up to 3.5 cm)”
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Reviewed / Approved by NIA Clinical Guideline Committee

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