



MASSACHUSETTS

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## Medical Policy

# Accelerated Breast Irradiation and Brachytherapy Boost after Breast-Conserving Surgery for Early Stage Breast Cancer

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### Policy Number: 326

BCBSA Reference Number: 8.01.13

NCD/LCD: N/A

### Related Policies

None

### Policy

#### Commercial Members: Managed Care (HMO and POS), PPO, and Indemnity Medicare HMO Blue<sup>SM</sup> and Medicare PPO Blue<sup>SM</sup> Members

When using radiation therapy after breast-conserving surgery (BCS) for early stage breast cancer:

Accelerated whole breast irradiation (AWBI) may be considered **MEDICALLY NECESSARY** for patients who meet the following conditions:

- Invasive carcinoma of the breast
- Tumors  $\leq 5$  cm in diameter
- Negative lymph nodes
- Technically clear surgical margins, ie, no ink on tumor or invasive carcinoma or ductal carcinoma in situ
- Age at least 50 years old.

As recommended by the Society of Surgical Oncology and the American Society for Radiation Oncology (ASTRO), technically clear surgical margins can be defined as no ink on tumor or invasive carcinoma or ductal carcinoma in situ ([http://www.redjournal.org/article/S0360-3016\(13\)03315-4/pdf](http://www.redjournal.org/article/S0360-3016(13)03315-4/pdf)).

As part of the clinical input process, ASTRO recommended additional criteria that should be satisfied for patients undergoing AWBI:

1. Pathologic stage is T1–2 N0 and the patient has been treated with breast-conserving surgery.
2. Patient has not been treated with systemic chemotherapy.
3. Within the breast along the central axis, the minimum dose is no less than 93% and maximum dose is no greater than 107% of the prescription dose ( $\pm 7\%$ ) (as calculated with 2-dimensional treatment planning without heterogeneity corrections).

AWBI is considered **INVESTIGATIONAL** in all other situations involving treatment of early-stage breast cancer after BCS.

Interstitial or balloon brachytherapy may be considered **MEDICALLY NECESSARY** for patients undergoing initial treatment for stage I or II breast cancer when used as local boost irradiation in those who are also treated with BCS and whole-breast external-beam radiotherapy.

Accelerated partial breast-irradiation (APBI), including interstitial APBI, balloon APBI, external beam APBI, noninvasive brachytherapy using Accuboot®, and intra-operative APBI, is considered **INVESTIGATIONAL**.

Noninvasive brachytherapy using Accuboot® for patients undergoing initial treatment for stage I or II breast cancer when used as local boost irradiation in those who are also treated with BCS and whole-breast external-beam radiotherapy is considered **INVESTIGATIONAL**.

## Prior Authorization Information

### Inpatient

- For services described in this policy, precertification/preauthorization **IS REQUIRED** for all products if the procedure is performed **inpatient**.

### Outpatient

- For services described in this policy, see below for products where prior authorization **might be required** if the procedure is performed **outpatient**.

	Outpatient
Commercial Managed Care (HMO and POS)	Prior authorization is <b>not required</b> .
Commercial PPO and Indemnity	Prior authorization is <b>not required</b> .
Medicare HMO Blue <sup>SM</sup>	Prior authorization is <b>not required</b> .
Medicare PPO Blue <sup>SM</sup>	Prior authorization is <b>not required</b> .

## CPT Codes / HCPCS Codes / ICD Codes

*Inclusion or exclusion of a code does not constitute or imply member coverage or provider reimbursement. Please refer to the member's contract benefits in effect at the time of service to determine coverage or non-coverage as it applies to an individual member.*

*Providers should report all services using the most up-to-date industry-standard procedure, revenue, and diagnosis codes, including modifiers where applicable.*

*The following codes are included below for informational purposes only; this is not an all-inclusive list.*

**The above medical necessity criteria MUST be met for the following codes to be covered for Commercial Members: Managed Care (HMO and POS), PPO, Indemnity, Medicare HMO Blue and Medicare PPO Blue**

### CPT Codes

CPT codes:	Code Description
19296	Placement of radiotherapy afterloading expandable catheter (single or multichannel) into the breast for interstitial radioelement application following partial mastectomy, includes imaging guidance; on date separate from partial mastectomy
19297	Placement of radiotherapy afterloading expandable catheter (single or multichannel) into the breast for interstitial radioelement application following partial mastectomy, includes imaging guidance; concurrent with partial mastectomy (List separately in addition to code for primary procedure)
19298	placement of radiotherapy afterloading brachytherapy catheters (multiple tube and button type) into the breast for interstitial radioelement application following (at the time of or subsequent to) partial mastectomy, includes imaging guidance

77770	Remote afterloading high dose rate radionuclide interstitial or intracavitary brachytherapy, includes basic dosimetry, when performed; 1 channel
77771	Remote afterloading high dose rate radionuclide interstitial or intracavitary brachytherapy, includes basic dosimetry, when performed; 2-12 channels
77772	Remote afterloading high dose rate radionuclide interstitial or intracavitary brachytherapy, includes basic dosimetry, when performed; over 12 channels
77778	Interstitial radiation source application, complex, includes supervision, handling, loading of radiation source, when performed
77261	Therapeutic radiology treatment planning; simple
77262	Therapeutic radiology treatment planning; intermediate
77263	Therapeutic radiology treatment planning; complex
77280	Therapeutic radiology simulation-aided field setting; simple
77285	Therapeutic radiology simulation-aided field setting; simple
77290	Therapeutic radiology simulation-aided field setting; complex
77295	3-dimensional radiotherapy plan, including close volume histograms
77316	Brachytherapy isodose plan; simple (calculation[s] made from 1 to 4 sources, or remote afterloading brachytherapy, 1 channel), includes basic dosimetry calculation(s)
77317	Brachytherapy isodose plan; intermediate (calculation[s] made from 5 to 10 sources, or remote afterloading brachytherapy, 2-12 channels), includes basic dosimetry calculation(s)
77318	Brachytherapy isodose plan; complex (calculation[s] made from over 10 sources, or remote afterloading brachytherapy, over 12 channels), includes basic dosimetry calculation(s)

## HCPCS Codes

HCPCS codes:	Code Description
C1717	Brachytherapy source, nonstranded, high dose rate iridium-192, per source
C9726	Placement and removal (if performed) of applicator into breast for radiation therapy
Q3001	Radioelements for brachytherapy, any type, each

The following CPT codes are considered investigational for **Commercial Members: Managed Care (HMO and POS), PPO, Indemnity, Medicare HMO Blue and Medicare PPO Blue:**

## CPT Codes

CPT codes:	Code Description
0395T	High dose rate electronic brachytherapy, interstitial or intracavitary treatment, per fraction, includes basic dosimetry, when performed

## Description

### BREAST CANCER

Current estimates suggest that over 266,000 new cases of breast cancer of any stage will occur in the United States in 2018. Based on adjusted data from 2011 to 2015, among women, the number of new cases is 126 per 100,000 and the number of deaths 21 per 100,000.

### BREAST CONSERVATION THERAPY

For patients diagnosed with stage I or II breast tumors, survival after breast conservation therapy (BCT) is equivalent to survival after mastectomy. BCT is a multimodality treatment that initially comprised breast-conserving surgery (BCS) to excise the tumor with adequate margins, followed by whole-breast external-beam radiotherapy (EBRT) administered as 5 daily fractions per week over 5 to 6 weeks. Local boost irradiation to the tumor bed often is added to whole-breast irradiation (WBI) to provide a higher dose of radiation at the site where recurrence most frequently occurs. For some patients, BCT also includes axillary lymph node dissection, sentinel lymph node biopsy, or irradiation of the axilla. A number of

randomized controlled trials have demonstrated that the addition of radiotherapy after BCS reduces recurrences and mortality. In an expanded update of an individual patient data meta-analysis, the Early Breast Cancer Trialists' Collaborative Group (EBCTCG) reported that radiotherapy halved the annual recurrence rate after 10 years for women with node-negative disease (n=7287), from 31.0% for those not receiving radiotherapy to 15.6% for those receiving it. It also reduced the 15-year risk of breast cancer death from 20.5% to 17.2% (p=0.005). For women with node-positive disease (n=1050), radiotherapy reduced the 1-year recurrence risk from 26.0% to 5.1%. Radiotherapy also reduced the 15-year risk of breast cancer death from 51.3% to 42.8% (p=0.01).

Consequently, radiotherapy is generally recommended following BCS. A potential exception is for older women at low risk of recurrence. For example, current National Comprehensive Cancer Network guidelines state that women ages 70 or older may omit radiotherapy if they are estrogen-receptor positive, have T1 tumors, have clinically negative lymph nodes, and plan to take adjuvant endocrine therapy. However, agreement is not universal.

Controversy continues on the length of follow-up needed to determine whether accelerated partial-breast irradiation (APBI) is equivalent to WBI (see the 2013 TEC Assessment on accelerated radiotherapy after BCS for early-stage breast cancer for details). Because recurrences are relatively rare among low-risk early breast cancer patients, it may take considerable time for enough recurrences to occur to provide sufficient power for comparing recurrence rates across radiotherapy approaches. Additionally, radiation-induced adverse cardiovascular effects and radiation-induced non-breast cancers tend to occur 10 or more years after treatment.<sup>5-7</sup> For accelerated whole-breast irradiation (AWBI), some 10-year data are available. However, for newer approaches, the issue may be resolved by statistical issues rather than biological ones. For example, in the large NSABP-39/RTOG 0413 trial comparing WBI and APBI (NCT00103181), enrollment has reached the revised target of 4216. Trial duration (barring early termination) is determined by the occurrence of a prespecified number (175) of in-breast recurrences. Researchers expect that reaching that number of recurrences will take approximately 10 years.

Currently, most patients diagnosed with stage I or II breast cancer are offered a choice of BCT or mastectomy, but BCT is selected less often than expected. Studies have shown that those living farthest from treatment facilities are least likely to select BCT instead of mastectomy and most likely to forgo radiotherapy after BCS.<sup>8-10</sup>

## **ALTERNATIVE RADIOTHERAPY REGIMENS**

Given that duration and logistics appear to be barriers to completion of treatment, there has been interest in developing shorter radiotherapy regimens. Two approaches have been explored.

The first method is to provide the same dose to the whole breast in a shorter time by increasing the dose provided per treatment (hypofractionation). This approach was initially avoided out of concern that increasing doses might induce more severe adverse events from radiation exposure, thus tipping the balance between benefits and harms. More recent research, some of which is highlighted below, has allayed most of these concerns. AWBI has been adopted widely in Canada and Europe.

The second approach to reducing radiotherapy treatment time is APBI. It differs from conventional WBI in several ways. First, the radiation only targets the segment of the breast surrounding the area where the tumor was removed, rather than the entire breast. This approach was based in part on the finding that recurrences are more likely to occur close to the tumor site rather than elsewhere in the breast. Second, the duration of treatment is 4 to 5 days (or 1 day with intraoperative radiotherapy) rather than 5 to 6 weeks, because radiation is delivered to the tumor bed in fewer fractions at larger doses per fraction. Third, radiation dose is intrinsically less uniform within the target volume when APBI uses brachytherapy (ie, the implantation of radioactive material directly in the breast tissue).

The major types of radiotherapy used after BCS are outlined in Table 1. They differ by technique, instrumentation, dose delivery, and possibly outcomes.

**Table 1. Major Types of Radiotherapy Following Breast-Conserving Surgery**

Radiation Type	Accelerated?	Whole or Partial Breast	EBRT or Brachytherapy	Treatment Duration	Published RCTs	Length of Follow-Up
Conventional WBI	No	Whole	EBRT	5-6 wk	Multiple	>15 y
Accelerated WBI	Yes	Whole	EBRT	3 wk	4	10 y
Interstitial APBIb	Yes	Partial	Brachytherapy	1wk	2	5.4 y
Balloon APBIc	Yes	Partial	Brachytherapy	1 wk	0	0
EBRT APBI d	Yes	Partial	EBRT	1 wk	0	0
Intraoperative APBIe	Yes	Partial	Not applicable	1d	1	5 y

APBI: accelerated partial-breast irradiation; EBRT: external-beam radiotherapy; RCT: randomized controlled trial; WBI: whole-breast irradiation.

a Noninvasive breast brachytherapy using AccuBoost has been described by the manufacturer as capable of delivering APBI, but no studies for this indication were found.

b Interstitial brachytherapy entails placement of multiple hollow needles and catheters to guide placement of the radioactive material by a remote afterloading device. It is more difficult to perform than other types of brachytherapy and has a steep learning curve.

c Balloon brachytherapy (eg, MammoSite) entails inserting a balloon into the tumor bed, inflating the balloon, confirming its position radiographically, and then using a remote afterloader to irradiate the targeted area. Some brachytherapy systems combine aspects of interstitial and balloon brachytherapy.

d External-beam APBI is delivered in the same way as conventional or accelerated whole-breast radiotherapy but to a smaller area. All 3 external-beam regimens can use 3-dimensional conformal radiotherapy or intensity-modulated radiotherapy.

e Intraoperative APBI is performed during breast-conserving surgery with a single dose of radiation delivered to the exposed tumor bed.

To appreciate the differences among radiotherapy techniques, it is useful to understand attributes of radiation delivery. The goals of cancer radiotherapy are to provide the tumor or tumor bed with a high dose of homogeneous radiation (ie, all parts of the tumor cavity receive close to the targeted dose). Areas adjacent to the tumor may be given a lower dose of radiation (eg, with WBI) to treat any unobserved cancerous lesions. Radiation outside the treatment area should be minimal or nonexistent. The goal is to target the tumor or adjacent areas at risk of harboring unseen cancer with an optimum dose, while avoiding healthy tissues.

### **BRACHYTHERAPY BOOST WITH WBI**

Brachytherapy also can be used as an alternative to EBRT to deliver boost radiotherapy combined with whole-breast EBRT. Most studies of local boost brachytherapy use temporarily implanted needles, wires, or seeds after patients have recovered from surgery and completed whole-breast radiotherapy.

## **Summary**

### **Accelerated Whole-Breast Irradiation**

For individuals who have node-negative, early-stage breast cancer with clear surgical margins who receive AWBI after BCS, the evidence includes randomized controlled trials (RCTs) and systematic reviews. Relevant outcomes are overall survival, disease-specific survival, change in disease status, and treatment-related morbidity. Two randomized noninferiority trials both reported 10-year follow-up data on local recurrence. Both trials found that local recurrence rates with AWBI were no worse than conventional whole-breast irradiation (WBI), when applying a noninferiority margin of 5%. Conclusions apply to patients meeting eligibility criteria of the RCTs trials, including having early-stage invasive breast cancer, clear surgical margins, and negative lymph nodes. In addition, consistent with national guidelines, these conclusions apply to tumors more than 5 cm in diameter and women at least 50 years old. The evidence

is sufficient to determine that the technology results in a meaningful improvement in the net health outcome.

**Accelerated Partial-Breast Irradiation**

For individuals who have early-stage breast cancer who receive interstitial brachytherapy, the evidence includes 1 completed RCT. Relevant outcomes are overall survival, disease-specific survival, change in disease status, and treatment-related morbidity. The RCT reported 5-year follow-up data and found that interstitial brachytherapy was noninferior to WBI for rates of local breast cancer recurrence, when applying a noninferiority margin of 3%. Ten-year follow-up data are needed on local recurrence as well as at least 1 additional trial confirming these findings. The evidence is insufficient to determine the effects of the technology on health outcomes.

For individuals who have early-stage breast cancer who receive intraoperative brachytherapy, the evidence includes RCTs. Relevant outcomes are overall survival, disease-specific survival, change in disease status, and treatment-related morbidity. Several RCTs have been published, but they have not demonstrated that outcomes after intraoperative brachytherapy are noninferior to WBI. Results of 2 RCTs (TARGIT-A, ELIOT) comparing intraoperative brachytherapy to WBI found higher rates of local recurrence with intraoperative brachytherapy than with WBI. The evidence is insufficient to determine the effects of the technology on health outcomes.

For individuals who have early-stage breast cancer who receive external-beam APBI, the evidence includes RCTs. Relevant outcomes are overall survival, disease-specific survival, change in disease status, and treatment-related morbidity. The RCTs only reported outcomes after 3 to 5 years, and 10-year data are required to draw conclusions about the impact of the technology on health outcomes. Moreover, 1 of the 2 trials reported higher rates of adverse cosmesis and grade 3 toxicities in the external-beam APBI group compared with the WBI group. The evidence is insufficient to determine the effects of the technology on health outcomes.

**Brachytherapy**

For individuals who have early-stage breast cancer who receive local boost brachytherapy with WBI, the evidence includes nonrandomized studies and a systematic review. Relevant outcomes are overall survival, disease-specific survival, change in disease status, and treatment-related morbidity. A TEC Assessment concluded that, for women undergoing BCS plus WBI as initial treatment for stage 1 or 2 breast cancer, nonrandomized comparative studies have shown similar outcomes with brachytherapy local boost and with external-beam radiotherapy local boost. The evidence is sufficient to determine that the technology results in a meaningful improvement in the net health outcome.

For individuals who have early-stage breast cancer who receive noninvasive breast brachytherapy, the evidence includes 1 retrospective comparative study. Relevant outcomes are overall survival, disease-specific survival, change in disease status, and treatment-related morbidity. The retrospective study was a matched comparison of noninvasive breast brachytherapy or electron-beam radiotherapy to provide boost radiation to the tumor bed. The study was subject to selection bias, relatively short follow-up, and use of a retrospective design. The evidence is insufficient to determine the effects of the technology on health outcomes.

**Policy History**

<b>Date</b>	<b>Action</b>
9/2018	BCBSA National medical policy review. No changes to policy statements. New references added. Background and summary clarified.
6/2018	BCBSA National medical policy review. Policy criteria clarified to state: tumors ≤5 cm in diameter. 6/14/2018
6/2017	BCBSA National medical policy review. New medically necessary indications described. Effective 6/1/2017.
1/2016	Clarified coding information.
2/2015	New references added from BCBSA National medical policy.

1/2015	Clarified coding information.
5/2014	BCBSA National medical policy review New investigational indications described. Effective 5/1/2014.
6/2013	BCBSA National medical policy review. Policy statement on criteria for accelerated whole breast radiation changed from “negative surgical margins” to “technically clear surgical margins”; no change to intent of policy statement. Effective 6/1/2013.
11/2011-4/2012	Medical policy ICD 10 remediation: Formatting, editing and coding updates. No changes to policy statements.
12/1/2011	New policy, effective 12/1/2011, describing covered and non-covered indication.

## Information Pertaining to All Blue Cross Blue Shield Medical Policies

Click on any of the following terms to access the relevant information:

[Medical Policy Terms of Use](#)

[Managed Care Guidelines](#)

[Indemnity/PPO Guidelines](#)

[Clinical Exception Process](#)

[Medical Technology Assessment Guidelines](#)

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