THE AMERICAN SOCIETY OF Breast Surgeons

Resource Guide

Axillary Management for Patients With In-Situ and Invasive Breast Cancer: A Concise Overview

Purpose

To outline axillary management of patients with in situ and invasive breast cancer.

Associated ASBrS Statements, Guidelines, or Quality Measures

1. Consensus Statement: Consensus Guideline on the Management of the Axilla in Patients With Invasive/In-Situ Breast Cancer – *Approved September 19, 2019*
2. Performance and Practice Guidelines for Sentinel Lymph Node Biopsy in Breast Cancer Patients – *Revised November 25, 2014*
3. Performance and Practice Guidelines for Axillary Lymph Node Dissection in Breast Cancer Patients – *Approved November 25, 2014*
4. Quality Measure: Sentinel Lymph Node Biopsy for Invasive Breast Cancer – *Approved November 4, 2010*
5. Resource Guide: Technical Considerations for Axillary Surgery in Breast Cancer Patients- *Anticipate approval May 2025*

Methods

A literature review inclusive of recent randomized controlled trials evaluating the use of sentinel lymph node surgery and axillary lymph node dissection for invasive and in-situ breast cancer as well as the pathologic review of sentinel lymph nodes and indications for axillary radiation was performed. This is not a formal systematic review but rather, a comprehensive review of recent relevant literature. A focused review of non-randomized controlled trials was then performed to develop consensus guidance on management of the axilla in scenarios where randomized controlled trials data are lacking. The ASBrS ALND Work Group developed a consensus document, which was reviewed and approved by the ASBrS Board of Directors on March 14, 2022. In 2025, the ASBrS Critical Writing, Editing, and Review Committee (CWERC) updated this resource guide, which was further revised after membership comment and approved by the ASBrS Board of Directors.

Summary of Data Reviewed

Background

Axillary management for breast cancer has become increasingly complex and often requires multidisciplinary discussion. The surgical oncologist can offer sentinel lymph node (SLN) surgery vs axillary lymph node dissection (ALND) vs omission of surgical axillary staging. The medical oncologist has many choices for systemic therapy, adjuvant and neoadjuvant. The radiation oncologist can offer partial versus whole breast radiation therapy (RT) versus no RT after breast conserving surgery, chest wall RT versus no RT after mastectomy, and decide whether or not to include nodal field RT.

Progress in each subspecialty compounds complexity, with advances in systemic therapy and RT allowing selective de-escalation in the extent of surgery. Finally, clinicians must draw on extensive literature comprising retrospective studies, randomized controlled trials (RCTs), systematic reviews, and meta-analyses.

Many ASBrS Official Statements (Consensus Guidelines, Quality Measures, and Performance and Practice Guidelines) address the axilla. Here, the objective was to provide a single "Quick Access" position statement combining all of these and outlining clinical indications, a departure from our usual guideline process. This document was further updated in 2025 to reflect new literature on the topic and transitioned to an ASBrS Resource Guide to align with society resource definitions.

Similar to earlier ASBrS guidelines on axillary management, we did not aim to satisfy the demanding requirements of formalized guideline development, and to this end, provide links to the recent and comprehensive ASCO Guideline and 2025 SLNB Update[1] for a deep dive into the topic.[2] We aimed to provide a practical, data-based, and concise summary of the current literature and an outline of our group consensus on axillary management (no axillary surgery vs SLN surgery vs ALND). This document is therefore not intended to be prescriptive; there is room for multidisciplinary collaboration throughout.

Recommendations

Indications for no surgical axillary lymph node staging

1. When surgical nodal staging will not affect adjuvant therapy recommendations.
    - Surgical axillary staging is of little value in the setting of limited life expectancy due to advanced age, serious comorbidities, or when it will not affect decisions regarding adjuvant therapy.[3]

2. Pure DCIS undergoing breast-conserving surgery (BCS).
    - Patients with DCIS and no pathologic suspicion of invasion do not require surgical axillary staging.[4,5] The overall risk of nodal metastasis for DCIS alone is approximately 1-2%.[6] While upstage to invasive cancer occurs in 7-28% of cases, clinical variables associated with increased risk of upstage at surgery for DCIS have varied between retrospective studies without clear consensus.[7-10] Thus, no axillary surgery is recommended at initial BCS for DCIS; delayed SLN surgery can be performed if necessary for invasive cancer upstage on surgical pathology. However, when large oncoplastic procedures are performed that would compromise future SLN mapping, up-front SLN surgery or the use of superparamagnetic iron oxide (SPIO) for delayed SLN

surgery can be considered (see #3 below in "Indications for SLN surgery").

3. ≥70 years of age with cT1-2N0 hormone receptor positive (HR+) breast cancer.[11]

   - 62% of patients in the CALGB 9343 RCT did not have surgical axillary staging and only 3% developed axillary recurrence. This trial is the basis of the SSO Choosing Wisely guideline recommendation against routine SLN surgery in patients age 70+ with HR+/HER2- invasive breast cancer, which is also an American College of Surgeons Commission on Cancer quality measure.[11,12]

   - This recommendation is further supported by several clinical trials which showed no significant difference in overall survival or breast cancer-specific survival when axillary surgery was omitted in women >70 years old with early stage HR+ breast cancer and clinically negative axillae treated with primary breast surgery and adjuvant endocrine therapy.[13-15]

4. *Consider* omission of surgical axillary staging in postmenopausal patients >50 years old with HR+/HER2- cT1N0 grade 1-2 invasive ductal breast cancer, a negative axillary ultrasound (or one suspicious node with FNA/core needle biopsy benign and concordant) and treated with BCS followed by adjuvant radiation.

   - In the INSEMA international, prospective, randomized non-inferiority trial 5-year invasive disease-free survival and 5-year overall survival were similar in the no axillary surgery vs. SLN surgery groups (91.9% vs. 91.7% iDFS and 98.2% vs. 96.9% OS). Axillary recurrence rates and distant metastasis were low and similar between groups.[16]

   - With a similar design, the SOUND trial also found that omission of axillary surgery was non-inferior to SLN surgery for 5-year distant DFS (98.0% vs. 97.7%), overall DFS (93.9% vs. 94.7%), and overall survival (98.4% vs. 98.2%). Further, adjuvant treatments were not different between study groups regardless of whether pathological information from SLN surgery was available.[17]

   - Acknowledging that the majority of patients in both the SOUND and INSEMA trials were treated with WBI, and that patients with invasive breast cancer enrolled in the RCTs of PBI were required to have axillary lymph node sampling, evidence supporting the safety and utility of PBI when surgical axillary staging is omitted is currently lacking. However, the low likelihood of nodal involvement in those satisfying criteria for SLN surgery omission in SOUND, INSEMA, and Choosing Wisely guidelines also suggests that this patient population may be suitable candidates for PBI. Furthermore, extrapolating from the PRIME II trial and CALGB 9343, for patients ≥ 65 years of age, radiation therapy can be omitted in patients committed to endocrine therapy without compromising overall survival, though local recurrence rates are slightly higher (~9%).[18]

   - While SOUND and INSEMA enrolled patients of all ages and receptor subtypes, the findings best support the safety of omitting axillary surgery in post-menopausal women with HR+/HER2- cT1N0 grade 1-2 invasive ductal breast cancer* and negative axillary

ultrasound evaluation. While longer follow-up is needed to assess late recurrences, this approach can be carefully considered in the context of multidisciplinary discussion when axillary pathology will not affect adjuvant treatment (i.e. de-escalation of radiation, indications for systemic therapy), and is supported by the 2025 ASCO Guideline Update on SLNB in Early-Stage Breast Cancer.[2]

* Please note that invasive lobular carcinoma and other histologic subtypes were underrepresented in these RCTs.

4. Prophylactic mastectomy
    - Surgical axillary staging is not recommended for risk-reducing prophylactic mastectomy, as the likelihood of incidentally finding invasive cancer is about 2% and about 1% for nodal metastases.
5. Primary breast sarcoma or phyllodes tumor.
    - The risk of nodal metastasis for breast sarcoma - including angiosarcoma and malignant phyllodes tumor - is negligible. Surgical axillary staging is not recommended.

Indications for sentinel lymph node (SLN) surgery

1. DCIS requiring mastectomy, undergoing excision in anatomic location compromising future SLN surgery mapping, or with pathologic suspicion of invasion.
    - SLN surgery should not be performed for biopsy-proven DCIS treated with breast-conserving surgery unless there is pathologic concern for invasion or micro-invasion, or discordance between clinical presentation and pathology.[19]
    - Upfront SLN surgery can be considered for DCIS undergoing large oncoplastic procedures and is common practice for DCIS undergoing mastectomy due to the concern for failure of delayed SLN surgery mapping should upgrade to invasive cancer be found on surgical pathology.[20,21]
    - Another option to facilitate delayed SLN surgery for DCIS upgraded to invasive cancer after mastectomy or oncoplastic BCS is pre-operative injection of superparamagnetic iron oxide (SPIO). With this technique, mapping occurs when lymphatics are intact at initial surgery and SPIO remains detectable in SLNs for up to 30 days. SPIO can be combined with other tracers to facilitate SLN identification in these settings.[22,23]
2. cT1mi-2N0 (palpably node-negative) cancer with normal axillary imaging
    - SLN surgery is indicated for most patients with cN0 breast cancer. This is supported by an extensive body of literature, but with variable use of axillary imaging. As ACOSOG Z0011 required no palpable axillary adenopathy and did not require negative axillary imaging, SLN surgery can be considered even if a previously non-palpable, image-detected node was found to contain metastasis.[24,25] (see #3 below)
3. cT1-2N0 (palpably node-negative) cancer with abnormal axillary imaging and/or a positive percutaneous lymph node needle biopsy

- About 70% of patients with a normal axilla on physical examination but abnormal axillary imaging - and about 50% of those with a positive FNA/core needle biopsy – will have 1-2 SLN+ and have the option to avoid ALND.[26] (see SLN #4 and 5 below)

4. cT1-2N0 (palpably node-negative) cancer with 1-2 SLN+ having BCT with WBRT, with or without axillary radiation

- SLN surgery without ALND is appropriate for patients undergoing BCT who meet the entry criteria of the IBCSG 23-01, Z0011, AMAROS and SENOMAC trials and are found to have 1 or 2 positive SLN.[27-29]

5. cT1-2N0 (palpably node-negative) cancer having mastectomy, with 1-3 SLN+ and receiving axillary RT

- Current ASCO and ASTRO guidelines support postmastectomy radiation (PMRT) with regional nodal irradiation (RNI) and omission of ALND in patients with cN0 invasive breast cancer ≤5 cm who undergo mastectomy and have 1-2 positive SLN(s).[2]

- SLN surgery without ALND may appropriate for patients undergoing mastectomy with 1-3 positive SLN who meet entry criteria for the AMAROS, OTOASOR, and SENOMAC trials. Omission of ALND with 3 positive SLN should be carefully considered in select patients as the data for 3 SLN+ is sparse: 95% of AMAROS patients had 1-2 SLN+, and only 17% had mastectomy.[30,31] While over 1/3 of the SENOMAC trial cohort underwent mastectomy, only 2% (52/2540) of patients had >2 SLN+.[29]

- When PMRT is not otherwise indicated (T1-2 cancer) and axillary disease is limited to 1-2+ SLN, ALND may still be considered if it will allow omission of PMRT with RNI, and surgery is preferred over radiation in shared decision making with the patient and multidisciplinary team. In a retrospective study of cN0 mastectomy patients with 1-2+ SLN, 5-year nodal recurrence rates were very low across the groups who received cALND alone, PMRT alone, cALND and PMRT, or no additional axillary treatment.[32]

6. cN0/ycN0 (palpably node-negative) cancer post neoadjuvant therapy

- Upfront image-guided needle biopsy is indicated for any patient with clinical or radiologic suspicion of node metastasis – SLN surgery should not be done prior to neoadjuvant therapy. SLN surgery performs well in the post-neoadjuvant setting, and while axillary US can suggest treatment response, it is not reliable enough to determine the surgical approach. SLN surgery is suitable for patients who were palpably node-negative, or biopsy-proven node-positive upfront, as long as they are palpably node-negative post-neoadjuvant.

- For patients who were biopsy-proven node-positive upfront, the false-negative rate (FNR) of SLN surgery in ACOSOG Z1071 was minimized by the retrieval of >2 SLN, by dual mapping, and by retrieval of the biopsied/clipped node.[33] However, if clipping of the nodes and/or retrieval is not performed, SLN surgery with retrieval of 3 or more negative sentinel nodes has been shown to be safe with a low rate axillary nodal recurrence.[34]

- Targeted axillary dissection (TAD), which is the combination of SLN surgery and removal

of previously biopsied and clipped lymph node(s) with intraoperative localization, can also decrease the FNR for cN+ patients with no palpable axillary disease post-neoadjuvant therapy, with FNRs as low as 6.8% in the subset of the Z1071 patients who had clipped nodes, and 2.0% in the prospective TAD registry at MD Anderson.[35-37]

- The data for SLN surgery following neoadjuvant therapy in patients presenting with cN2 disease is sparse– in ACOSOG Z1071, 95% of patients had cN1 disease at presentation.[33,35,38-42] (see ALND #1 below)

- Two international prospective clinical trials are investigating whether surgical axillary staging can be omitted in selected cN0 patients treated with neoadjuvant systemic therapy, ASICS and EUBREAST-01. Both are enrolling patients with cN0 HER2+ or TNBC disease who achieve a complete radiographic response in the breast, the population identified as lowest risk for SLN+ disease post-neoadjuvant therapy.[43,44] In the interim, SLN surgery should be performed in this setting as the estimated FNR was 6% (range 0-33%) in a meta-analysis of 16 studies of cN0 patients who underwent neoadjuvant chemotherapy and SLN surgery followed by ALND.[45] Techniques to reduce the FNR for cN0 patients are similar to cN+ (i.e. dual tracer mapping and removal of 2 or more SLN).[46,47]

7. Invasive local recurrence post-BCT with a cN0 axilla

- SLN surgery is feasible for patients with prior BCT/SLN surgery or BCT/ALND who present with invasive local recurrence and a cN0 axilla. All patients with invasive local recurrence require systemic adjuvant therapy, so it is not yet clear if the results of a re-operative SLN surgery are meaningful in this setting.[48]

- Surgical axillary staging may be appropriate to omit in cN0 patients with a prior ALND who fail to map during SLN surgery for recurrent disease. Management strategies for the axilla with recurrent cN0 disease and prior axillary surgery are referenced in ASBrS Resource Guide "Technical Considerations for Axillary Surgery in Breast Cancer Patients".

Indications for axillary dissection (ALND)

1. cN2-3 on presentation (palpably node-positive and biopsy-proven)

- To avoid false-positives, percutaneous needle biopsy is indicated to confirm node status in all patients with clinical or radiologic suspicion of node metastasis. Most patients with cN2-3 disease will receive neoadjuvant therapy, and since the performance of SLN surgery in this setting is uncertain (see SLN #6 above), ALND is appropriate either upfront (for patients who are ineligible for neoadjuvant) or post-neoadjuvant.

- Supraclavicular and/or internal mammary nodal disease is best treated with systemic therapy and RT.

2. cN0 with positive SLNs and ineligible for IBCSG 23-01/Z0011/AMAROS/OTOASOR

- In the setting of upfront surgery, ALND is appropriate for BCT patients with >2 SLN+ and for mastectomy patients with >3 SLN+.

- As above in SLN #5, ALND may be considered for mastectomy patients with 1-2 SLN+ to allow omission of PMRT/RNI when there are no other indications for radiation based on tumor size or clinical features.

3. cN1 (palpably node-positive and biopsy-proven) and ineligible for neoadjuvant therapy

   - ALND is appropriate for patients with cN1 disease who are not candidates for neoadjuvant systemic therapy (see ALND #1 above) and are suspected to have higher volumes of nodal disease (i.e. not eligible for SLN #4/5 above).

4. cN1-2 (palpably node-positive) post-neoadjuvant therapy

   - ALND is indicated for patients who remain palpably node-positive following neoadjuvant therapy.

5. SLN+ post neoadjuvant therapy

   - For upfront surgery, the oncologic outcomes of axillary RT versus ALND for patients with cN0 disease are comparable, with less morbidity for axillary RT. This has not yet been demonstrated for the post-neoadjuvant setting, and ALND is indicated for patients who are cN0 but SLN+.

   - For patients with cN0-cN1 disease treated with neoadjuvant therapy, ALND is indicated with the findings of residual micrometastasis or macrometastasis.

   - For patients with cN0-cN1 disease treated with neoadjuvant therapy and who are found to have residual isolated tumor cells only (ypN0(i+)), nodal burden is low and axillary recurrence after ALND omission is rare. ALND may be omitted in this setting.[49]

   - The Alliance A011202 trial (a randomization of patients with positive SLN post-neoadjuvant to ALND vs axillary RT) evaluating axillary RT as an alternative to ALND has completed accrual and mature results are eagerly awaited.[50]

6. Inflammatory breast cancer

   - Limited data on the performance of SLN surgery post-neoadjuvant for inflammatory breast cancer indicate low success and high false-negative rates.[51-53] ALND is indicated in this setting.

7. Invasive local recurrence with cN1-2 (palpably node-positive and biopsy-proven) axilla

   - ALND is indicated for patients with invasive local recurrence and clinically positive nodes.

8. Axillary metastasis from occult breast primary

   - ALND is the standard of care for patients with occult breast cancer presenting with axillary metastases.[19] Most patients with axillary metastasis from an unknown breast primary are candidates for neoadjuvant therapy. Recently, smaller studies have reported excellent rates of nodal pCR, questioning the role of ALND and suggesting

that targeted axillary dissection and SLN surgery alone may be feasible in selected patients if no residual disease is identified.[54,55] ALND is appropriate for those who are ineligible for neoadjuvant therapy or remain node-positive post-neoadjuvant as per item #5 above..

Sequencing treatment to minimize the odds of ALND

Tumor subtype is an important predictor of lymph node response to neoadjuvant chemotherapy, with rates of nodal pathologic complete response (pCR) ranging from about 20% for ER+/PR+/HER2- to over 90% for ER-/PR-/HER2+. Most patients with palpably node-positive axillae will be referred for neoadjuvant therapy - regardless of tumor subtype - to downstage the breast/axilla. For patients who are palpably node-negative, the rates of ALND for the less responsive subtype ER+/PR+/HER2- (most of whom will remain node-positive post-neoadjuvant) will be minimized by a strategy of upfront surgery, in that most will have 0-2 SLN+ and can avoid ALND. For those with the responsive subtypes ER-/PR-/HER2- and ER-/PR-/HER2+, the rates of ALND will be minimized by a strategy of neoadjuvant chemotherapy.[55,56]

Prevention of lymphedema

Lymphedema is a significant complication of ALND, affecting approximately 20% of patients. The only clear risk factors are BMI and extent of axillary surgery, but chemotherapy and especially RT are additive.. Newer surgical techniques, such as axillary reverse mapping, lymphatic transfer, and lympho-venous anastomosis are promising both for prevention and for treatment of established lymphedema. However, well-designed prospective studies with uniform criteria for patient selection, procedure, and outcome assessment are needed. In institutions where these techniques are readily available, they should be considered whenever ALND is required.[57-59] Please see the ASBrS statements on "Diagnosis, Prevention, and Treatment of Breast Cancer-Related Lymphedema" for additional information.

Summary of Key Recommendations for Surgical Axillary Lymph Node Staging

Recommendation	**Clinical setting**	**References/ Key studies**
No surgery	When surgical nodal staging will not affect adjuvant therapy decisions	3
	Pure DCIS undergoing BCS	4-10
	Patients ≥70 years old with cT1-2N0 HR+ breast cancer	11-15
	Consider omission of surgical axillary staging in postmenopausal patients >50 years old with HR+HER2- cT1N0 grade 1-2 invasive ductal breast cancer, a negative axillary ultrasound (or one suspicious node with FNA/CNB benign and concordant) and	2, 16-18

	treated with BCS followed by adjuvant radiation	
	Prophylactic mastectomy	
	Primary breast sarcoma or phyllodes tumor	
SLNB	DCIS requiring mastectomy, undergoing excision in anatomic location compromising future SLN surgery mapping including large oncoplastic rearrangement, or with pathologic suspicion of invasion or microinvasion; consider using SPIO for delayed SLN surgery if upgrade to invasive cancer found on surgical pathology	19-23
	cT1mi-2N0 (palpably node-negative) breast cancer with normal axillary imaging	24, 25
	cT1-2N0 (palpably node-negative) breast cancer with abnormal axillary imaging and/or a positive percutaneous lymph node needle biopsy	26
	cT1-2N0 (palpably node-negative) breast cancer with 1-2 SLN+ having BCT with WBRT	27-29
	cT1-2N0 (palpably node-negative) breast cancer having mastectomy, with 1-3 SLN+ and receiving axillary RT	2, 29-32
	cN0/cyN0 (palpably node-negative) breast cancer post neoadjuvant therapy	33-45
	Invasive local recurrence post-BCT with a cN0 axilla	48, ASBrS RG "Technical Considerations for Axillary Surgery"
ALND	cN2-3 on presentation (palpably node-positive and biopsy-proven)	29-33
	cN0 with positive SLNs and ineligible for IBCSG 23-01/Z0011/AMAROS/OTOASOR	
	cN1-2 (palpably node-positive and biopsy-proven) and ineligible for neoadjuvant therapy	
	cN1-2 (palpably node-positive) post-neoadjuvant therapy	18
	SLN+ post neoadjuvant therapy	19, 49-50
	Inflammatory breast cancer	51-53
	Invasive local recurrence with cN1-2 (palpably node-positive and biopsy-proven) axilla	

	Axillary metastasis from occult breast primary (SLN surgery/TAD can be considered if cN0 post-NAC)	19, 54-55

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