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Review Article

AGO Breast Committee recommendations for the surgical therapy of breast cancer: Working Group on Gynecologic Cancers (AGO) update 2026☆

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ABSTRACT

The German Guideline Committee (AGO: Working Group on Gynecologic Cancers) updated its yearly recommendations on the diagnosis and treatment of breast cancer in March 2026. Chapters on oncological and oncoplastic-reconstructive surgery are coordinated with the Working Group for Plastic, Aesthetic, and Reconstructive Surgery in Gynecology (AWOgyn). The most important changes include the ommission of sentinel lymph node biopsy (SLNB) and preffered axillary staging in patients with node-positive breast cancer undergoing neoadjuvant chemotherapy (NACT). Targeted axillary dissection (TAD) is endorsed as the method of choice [AGO ++] in patients converting from cN + to ycN0 status, and other de-escalated techniques (SLNB, target lymph node biopsy [TLNB]) are also possible options [AGO +]. Following NACT, ALND is indicated only when macrometastatic disease is detected in the sentinel and/or in the target lymph node.

1. Introduction

Each year, the interdisciplinary AGO Breast Committee issues updated, state-of-the-art recommendations for the prevention, diagnosis, and treatment of breast cancer. These updates follow a structured and documented algorithm [1,2]. The most recent and relevant publications are systematically reviewed, and their scientific validity is assessed using the Oxford Level of Evidence (LoE). The strength of each recommendation is determined according to the Oxford Grades of Recommendation (GR) as well as the AGO grading system (Table 1) [3]. The latest updated recommendations were released by the AGO Breast Committee in March 2026 [4,5]. Two chapters focus on surgical treatment and are consented with the AWOgyn (Working Group for Plastic, Aesthetic and Reconstructive Surgery in Gynecology):

- Breast Cancer Surgery - Oncological Aspects
- Oncoplastic and Reconstructive Breast Surgery

Table 1
AGO grades of recommendation.

AGO ++	This investigation or therapeutic intervention is highly beneficial for patients, can be recommended without restriction, and should be performed
AGO +	This investigation or therapeutic intervention is of limited benefit for patients and can be performed
AGO +/-	This investigation or therapeutic intervention has not shown benefit for patients and may be performed only in individual cases. According to current knowledge a general recommendation cannot be given.
AGO -	This investigation or therapeutic intervention can be of disadvantage for patients and might not be performed
AGO –	This investigation or therapeutic intervention is of clear disadvantage for patients and should be avoided or omitted in any case

The Breast Committee of the German Gynecological Oncology Group (AGO) recommendations are updated yearly and are available in English and German at https://www.ago-breast.com. Before the voting, the current evidence is discussed and graded within the Committee. This year, the surgery-related chapter focused on axillary staging techniques in upfront surgery and the neoadjuvant setting. The following manuscript presents an overview of updated recommendations for surgical and oncoplastic-reconstructive therapy of breast cancer.

2. Surgical therapy in the upfront surgery setting

2.1. Surgery of the breast

Surgical therapy of the breast in the upfront setting for early breast cancer consists of two primary options: breast-conserving surgery (BCS) and mastectomy, with or without immediate reconstruction. Both approaches are considered standard, and decades of clinical trials have established that BCS followed by radiation yields equivalent rates of local recurrence compared to a mastectomy, while overall survival is at least equivalent for appropriately selected patients [6,7]. The choice between these options is influenced by tumor size relative to breast size, ability to achieve negative margins, patient preference, genetic risk (e.g., BRCA mutation), as well as contraindications to radiation therapy. BCS is associated with better quality of life, fewer complications, and superior cosmetic outcomes compared to mastectomy [8]. Final treatment decisions should be made through a shared decision-making process with the patient. Surgery is one stage within a multi-step breast cancer treatment plan. Treatment should start within 8 weeks of confirmed diagnosis, and every breast surgeon must possess both diagnostic and oncological expertise (AGO ++) [9]. Before deciding on the surgical treatment of the breast and axilla, a careful assessment of the breast and axilla is necessary. For initial staging in patients with breast cancer, a comprehensive medical history and thorough clinical examination are always required. If there is a high risk of metastases and/or relevant symptoms and/or an indication for (neo-)adjuvant chemotherapy or antibody therapy, additional imaging should be performed.

[1] Contributed equally to this manuscript.

The sequence of individual treatments in terms of timing and scope of surgery, systemic therapy, and radiotherapy should be determined within the framework of a multimodal treatment strategy, according to the stage and tumor biology.

Based on the most recent global registry and clinical trial data, at least two-thirds of patients with early-stage breast cancer worldwide are eligible to undergo BCS. The VENUSCANCER analysis of nearly 276,000 women from 39 countries found that the proportion of women with early, node-negative breast cancer treated with BCS plus radiotherapy ranged from 52.5% to 82.2% in high-income countries, with most European countries reporting rates between 67% and 78% [10].

In the case of BCS, non-palpable breast lesions require a localization device for surgical excision. Wire-guided localization (WGL) has long been considered the standard of care for removing non-palpable breast lesions. Over the past two decades, intraoperative ultrasound (IOUS) and various probe-guided methods have expanded the options for lesion localization [11]. Two network meta-analyses of randomized controlled trials indicated that various localization techniques had similar rates of positive margins, ranging from 15 to 21%. IOUS achieves better margin status and lower re-excision rates than WGL, but is limited to solid lesions visible upon ultrasound and requires substantial surgical and diagnostic expertise (AGO ++) [12–14]. Wire-free, non-radioactive methods—such as magnetic or paramagnetic markers, radar reflectors, and radiofrequency identification tags—show very promising early results but are associated with higher initial device costs. MagSeed™ (Endomag, Cambridge, UK), a paramagnetic marker, licensed for breast and axillary placement, has demonstrated similar re-excision rates and resection ratios but less localization failures compared to the guidewire in the randomized MagTotal study [15–17]. Importantly, the experience of surgeons, radiologists, and surgical coordinators was more favorable with the seed. Nevertheless, it should be noted that MagSeed™ localization can be affected by interference from metal surgical instruments and it is not suitable for MRI-based assessment of response during neoadjuvant chemotherapy. Radioactive seed localization (RSL) is well-validated but its application is limited by radiation safety regulations in many countries. Depending on the studies included, meta-analyses comparing RSL and WGL showed equivalent or lower rates of positive margins and lower reoperation rates [18,19]. The multinational ongoing MELODY (Methods for Localization of Different types of breast lesions) study, initiated by the EUBREAST and iBRA-NET, aims to explore the safety, efficacy. and patient-/clinician-reported outcomes of different localization techniques (NCT05559411, http://eubreast.org/melody) [11].

The aim of surgical treatment is to remove the tumor with clear resection margins. In BCS for invasive breast cancer with or without an extensive intraductal component (EIC), the goal is to achieve tumor-free margins, with “no ink on tumor” considered an adequate margin — even in cases of unfavorable tumor biology (AGO ++). Re-excision is indicated if invasive or non-invasive tumor cells are found at the margin in the final histology. It should be noted that EIC is not uniformly defined in the literature; according to the German S3 guideline, an increased risk of local recurrence is assumed if the intraductal component is at least twice as large as the largest dimension of the invasive tumor component. Furthermore, in cases of EIC, a second excision should not be performed if the margin of the intraductal component is narrow (<2 mm in the final histology). In this situation, treatment should be tailored to the individual patient, taking into account the patient's age and tumor extent.

IOUS examination increases the negative margin rates in non-palpable and palpable lesions (AGO +). Another advantage of IOUS is that less healthy breast tissue needs to be removed. The COBALT study demonstrated that IOUS resulted in smaller excision volumes than those in palpation-guided surgery, leading to better cosmetic results and higher patient satisfaction [20]. Placement of surgical clips at the margins of the lumpectomy cavity improves the precision and consistency of target volume delineation in both boost and partial breast irradiation settings (AGO +).

In cases of non-palpable lesions and/or tumor-associated microcalcifications, intraoperative radiography and/or ultrasound checks of the specimen should be performed to verify and document complete removal (AGO ++). A systematic review and meta-analysis comparing radiography, digital breast tomosynthesis (DBT), micro-CT, and ultrasound for intraoperative breast margin assessment found that ultrasound had the best and radiography the worst diagnostic performance. Pooled sensitivity, specificity, and AUC were 52%, 77%, and 0.60 for radiography; 67%, 76%, and 0.76 for DBT; 68%, 69%, and 0.72 for micro-CT; and 72%, 78%, and 0.80 for ultrasound [21].

Mastectomy is still recommended for early-stage breast cancer when BCS is contraindicated, not feasible, or not preferred by the patient. Reasons can be inability to obtain negative margins after repeated excisions, extensive, or multicentric disease, diffuse suspicious microcalcifications, contraindications to radiation therapy or limited access to radiotherapy. Individuals with genetic mutations that pose a high risk may opt for a mastectomy to reduce their risk. Skin and nipple sparing mastectomies are considered oncologically safe in appropriately selected patients and improve cosmetic and quality-of-life outcomes compared to traditional mastectomy [22].

2.2. Surgery of the axilla

2.2.1. Axillary surgery for clinically node-negative (cN0) breast cancer

At the beginning of the 21st century, ALND was replaced by SLNB for patients with clinically negative axillary lymph node status [23]. The advantage of SLNB is lower arm morbidity compared to ALND (lymphedema 5–7% versus 10–20%, neuropathy 11% versus 31%, deterioration in quality of life 23% versus 35%) [24]. Despite a false-negative rate (FNR) of 5–8% for SLNB, randomized clinical trials have shown no impact on disease-free or overall survival compared with ALND [3]. SLNB is not recommended in cases of inflammatory breast cancer (AGO -). The standard for marking the sentinel lymph node remains radiotracer localization with technetium and probe-assisted detection (AGO ++). Alternatively, intraoperative marking with indocyanine green (ICG) and detection with a near-infrared camera or with superparamagnetic iron oxide (SPIO), are increasingly used (AGO +) [25]. ICG is approved for SLN detection in breast cancer in many countries; the most recent regulatory approval was issued in November 2025 in Germany. Due to persisting artifacts potentially masking the tumor bed after BCS, the importance of postoperative surveillance MRI needs to be taken into account when using SPIO. Recently, a prospective cohort study showed that a targeted peritumoral SPIO injection followed by removal of SPIO during BCS may reduce the risk of postoperative MRI artifacts [26].

After the results of the ACOSOG Z0011 study showed no advantage of completion ALND in terms of locoregional recurrence rate and overall survival in patients with 1-2 metastatic sentinel lymph nodes (SLN) [27–30], it is no longer recommended for patients with upfront BCS, tumor stages T1-T3, postoperative whole-breast irradiation, and an adequate systemic therapy (AGO -). The analyses of Z0011 validation studies (SINODAR-ONE, SENOMAC) have confirmed the non-inferiority of the SLNB-alone arm compared to completion ALND. However, the median published follow-up in both trials is still below 5 years [31,32]. In the SENOMAC study, the inclusion criteria were extended to T3 carcinomas. Only the secondary outcome analysis of the second randomisation within the INSEMA study failed to fully confirm the non-inferiority of the SLNB-only arm in patients with 1-3 sentinel macrometastases and BCS, with a median follow-up of 6.2 years [33]. The pending analyses of the primary objectives of the two largest Z0011 validation studies, SENOMAC (5-year overall survival) and POSNOC (axillary recurrence rate after 5 years), are therefore awaited [34,35]. In the context of ALND omission in patients with sentinel lymph node macrometastases, inclusion of axillary levels I-IV (AGO +) according to the AMAROS and OTOASOR trials or of axillary levels I/II up to 5 mm below the axillary vein in analogy to the Z0011 trial (AGO +; only when

there is no indication for regional nodal irradiation (RNI) based on other risk factors) is recommended.

For patients undergoing primary mastectomy, the recommendation regarding completion ALND in cases of 1-2 sentinel macrometastases depends on whether a post-mastectomy radiotherapy (PMRT) is planned or not. In 2024, secondary outcome data from the prospective randomised SENOMAC study (with more than one third of patients undergoing mastectomy [n = 920]) were published. After a median follow-up of 46.8 months, no difference in recurrence-free survival was observed in the mastectomy subgroup with a maximum of 2 metastatic SLNs and no ALND (91.6% versus 89.5%) [32]. However, the de-escalation of axillary surgery was partially offset by an escalation of postoperative radiotherapy. Almost all SENOMAC patients received PMRT as well as regional nocal irradiation (RNI) to the ipsilateral lymph drainage areas (axillary levels II-IV, interpectoral) [36].

Currently, completion ALND in case of 1-2 sentinel macrometastases following a mastectomy can be omitted only in cases of PMRT with RNI (AGO -) [37]. If there is no indication for PMRT, completion ALND should only be omitted in individual cases (AGO +/−). In the randomized-controlled SUPREMO trial which showed no benefit of PMRT in patients with intermediate risk-breast cancer, all patients with node-positive disease underwent ALND [38]. Only a small subgroup of the SINODAR-ONE study and a retrospective meta-analysis provide evidence that de-escalation is an option in this setting [39,40].

Omission of SLNB in cN0 patients and upfront BCS.

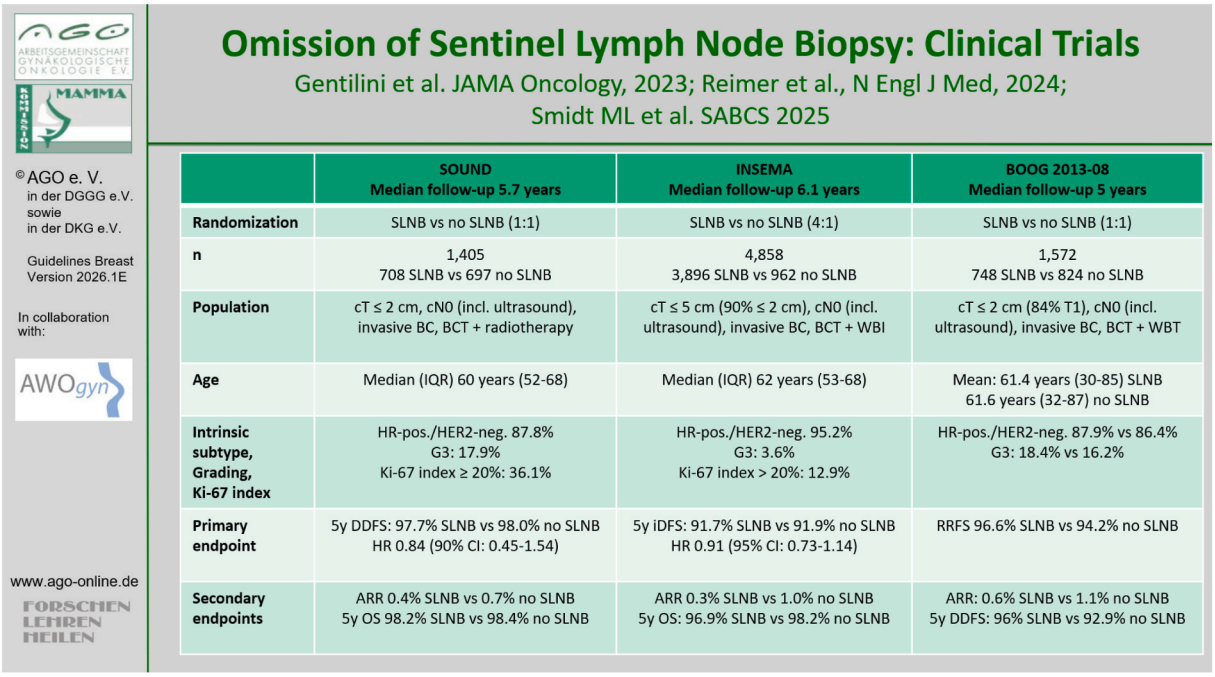
The complete omission of axillary surgery as the next de-escalation step in cN0 situations was investigated in three clinical trials restricted to BCS (Fig. 1). In 2021, the American Society of Clinical Oncology (ASCO) recommended foregoing axillary surgery in the absence of clinical benefit for older patients aged 70 and above with cN0 status and a maximum 2 cm breast cancer as well as favorable tumor biology (hormone receptor [HR]-positive, human epidermal growth factor receptor-2 [HER2]-negative tumor), regardless of whether BCS or mastectomy is performed [41]. The SOUND study demonstrated non-inferiority of this approach for a broader population [18]. In the SOUND trial, upfront BCS was performed in patients with T1 breast cancer and cN0 status, who were randomised between SLNB (n = 708) and no axillary surgery (n = 697). There were no differences in 5-year distant disease-free survival (97.7% versus 98.0%) and overall survival (98.2% versus 98.4%). More than 90% of patients had an HR-positive/HER2-negative tumor, and 80% were peri- or postmenopausal.

The multicentric German-Austrian INSEMA study included 5154 patients with T1 or T2 breast cancer without lymph node involvement on clinical examination or axillary ultrasound. Patients were randomized to either no axillary surgery or SLNB in a 1:4 allocation. The primary endpoint of the study was invasive disease-free survival (iDFS). Secondary endpoints included overall survival, complication rates, and recurrence patterns. The evaluation of the primary study results is based on a median follow-up period of 73.6 months (6.1 years). The follow-up results showed that foregoing axillary surgery had no negative impact on survival. The estimated 5-year iDFS was 91.9% in the group without axillary surgery compared to 91.7% in the control group. Overall survival rates were comparable (98.2% versus 96.9%) [42].

The primary results of the third SLNB-omission study from the Netherlands (BOOG 2013-08) were presented at the San Antonio Breast Cancer Symposium in December 2025. This de-escalation study also met the primary endpoint (axillary recurrence rate after a median follow-up of 5 years), with the difference between the study arms below the non-inferiority margin of 5%. Surprisingly, more than 50% of study participants with HR-positive/HER2-negative disease did not receive endocrine therapy. Currently, the results are available only as an abstract (Smidt et al., late-breaking abstract, General Session #2, SABCS 2025); the full-text publication is still pending.

The published results of the SOUND and INSEMA studies have been incorporated into the updated ASCO guideline on SLNB [43]. All three studies demonstrate that omission of axillary surgery is safe in certain low-risk patients with early-stage, cN0 breast cancer. The following criteria must be met to consider omission of SLNB when the result would not influence postoperative treatment decisions (AGO ++):

- Postmenopausal women (aged ≥50 years) with cN0 status
- HR-positive/HER2-negative subtype with tumor grading G1/G2
- Preoperative tumor size up to 2 cm
- Planned BCS with postoperative whole-breast irradiation.



	SOUND Median follow-up 5.7 years	INSEMA Median follow-up 6.1 years	BOOG 2013-08 Median follow-up 5 years
Randomization	SLNB vs no SLNB (1:1)	SLNB vs no SLNB (4:1)	SLNB vs no SLNB (1:1)
n	1,405 708 SLNB vs 697 no SLNB	4,858 3,896 SLNB vs 962 no SLNB	1,572 748 SLNB vs 824 no SLNB
Population	cT ≤ 2 cm, cN0 (incl. ultrasound), invasive BC, BCT + radiotherapy	cT ≤ 5 cm (90% ≤ 2 cm), cN0 (incl. ultrasound), invasive BC, BCT + WBI	cT ≤ 2 cm (84% T1), cN0 (incl. ultrasound), invasive BC, BCT + WBT
Age	Median (IQR) 60 years (52-68)	Median (IQR) 62 years (53-68)	Mean: 61.4 years (30-85) SLNB 61.6 years (32-87) no SLNB
Intrinsic subtype, Grading, Ki-67 index	HR-pos./HER2-neg. 87.8% G3: 17.9% Ki-67 index ≥ 20%: 36.1%	HR-pos./HER2-neg. 95.2% G3: 3.6% Ki-67 index > 20%: 12.9%	HR-pos./HER2-neg. 87.9% vs 86.4% G3: 18.4% vs 16.2%
Primary endpoint	5y DDFS: 97.7% SLNB vs 98.0% no SLNB HR 0.84 (90% CI: 0.45-1.54)	5y iDFS: 91.7% SLNB vs 91.9% no SLNB HR 0.91 (95% CI: 0.73-1.14)	RRFS 96.6% SLNB vs 94.2% no SLNB
Secondary endpoints	ARR 0.4% SLNB vs 0.7% no SLNB 5y OS 98.2% SLNB vs 98.4% no SLNB	ARR 0.3% SLNB vs 1.0% no SLNB 5y OS: 96.9% SLNB vs 98.2% no SLNB	ARR: 0.6% SLNB vs 1.1% no SLNB 5y DDFS: 96% SLNB vs 92.9% no SLNB

Fig. 1. Trials investigating omission of SLNB in the setting of upfront surgery.

Importantly, omitting SLNB must not result in suboptimal postoperative treatment recommendations and should be discussed in a multidisciplinary preoperative tumor board (AGO ++). Radiotherapy represents a controversial aspect in this context, as partial breast irradiation is currently not recommended when SLNB has not been performed due to the lack of supporting data for patients without axillary surgical staging [44]. Furthermore, uncertainties regarding lymph node status can lead to potentially indicated adjuvant therapies, such as cyclin-dependent kinase (CDK) 4/6 inhibitors, not being used appropriately. However, the results of the INSEMA and SOUND studies suggest that safe de-escalation is possible with strict patient selection [45].

2.2.2. Axillary surgery for primary node-positive (cN+) breast cancer

The optimal surgical procedure for patients with initially affected axillary lymph nodes is currently under discussion. In any case, a core-needle biopsy of the abnormal lymph node is recommended. This information should clarify the dignity of the lesion, and it is important to examine the tumor biology of the lymph node metastasis. If primary surgery is recommended at the multidisciplinary tumor board, a complete ALND is performed, which usually includes levels I and II [46]. The TAXIS trial (NCT03513614) compares ALND to a de-escalated approach of tailored axillary surgery (TAS), which includes removal of the SLN and selective removal of all palpable disease during surgery. RNI will be applied in both groups with inclusion of axilla level I/II only in the TAS-arm.

3. Surgical therapy in the neoadjuvant setting

3.1. Surgery of the breast

Patients scheduled to receive neoadjuvant chemotherapy (NACT) should be discussed in the multidisciplinary tumor board before treatment to define possible surgical options. Early marking of the tumor including detailed topographic documentation, either before start of systemic therapy, or during the first cycles is recommended. During NACT, response to treatment is evaluated using clinical examination and imaging. Surgery should be performed 4 to 8 weeks after the last administration of chemotherapy and aims at removing all visible tumor manifestations, and in case of a clinical complete response the marked area should be excised (resection “in new margins”). The recommendations regarding clear margins do not differ from those in the upfront surgery setting.

While NACT may enable breast conservation in some patients, mastectomy is recommended in case of positive margins after repeated excisions. The decision to perform a mastectomy in case of inflammatory, multicentric, and locally advanced (cT4a-c) breast cancer should be made on a case-by-case basis (AGO +/−).

3.2. Surgery of the axilla

Surgical staging of the axilla following NACT provides important prognostic information and may impact postneoadjuvant systemic and locoregional treatment decisions [47]. Nodal response has been identified as the strongest prognostic factor for invasive recurrences [48]. Residual nodal disease requires regional therapy and may lead to additional systemic treatment, specifically in triple-negative or HER2-positive patients or BRCA mutation carriers [49–51].

SLNB is recommended for all patients staged as cN0 and should be performed after NACT. Retrospective studies have shown that axillary lymph node involvement is rare (<2 %) in clinically node-negative HER2-positive or triple-negative breast cancer patients, who achieve pathological complete response (pCR) in the breast [52]. Omission of SLNB is under investigation in three prospective cohort studies, which include patients with cT1 and cT2 disease who undergo breast-conserving therapy [53]. The EUBREAST-01 and ASLAN studies have already completed accrual.

Despite initial concerns regarding the safety of SLNB after NACT in patients with biopsy-proven node-positive disease converting to ycN0 [54], the AXSANA study, presented at the San Antonio Breast Cancer Conference 2025, provided evidence from the largest available prospective multicenter cohort study, including 288 study sites across 26 countries, that less invasive staging procedures are safe in terms of regional control. No differences were observed between ALND and less invasive procedures, or between SLNB and TAD [55,56]. The results confirmed findings from previous smaller studies and retrospective series [57–62]. In light of these mature data, the AGO revised its 2025 recommendations and defined targeted axillary dissection (TAD) as the preferred procedure for surgical axillary staging after NACT (AGO ++). SLNB and TLNB are also accepted techniques (AGO +), while ALND is no longer recommended as a standard to stage the axilla (AGO +/−) (Fig. 2). The lower SLNB rating compared to TAD is explained by a higher detection failure rate and lower accuracy, with potential impact on invasive recurrences, as observed in some studies [58]. Some concern remains for patients with 4 or more clinically involved lymph nodes at the time of diagnosis, which translates into a slightly lower recommendation grade for TAD in these patients (AGO +). In this context, it is worth noting that a higher number of suspicious lymph nodes (e.g., 4 or more) does not necessarily translate to a cN2 (or higher) nodal stage, since the clinical (cN) and pathological (pN) nodal status classification are based on different assessment principles. The cN is determined using physical examination and imaging and reflects the presence and clinical characteristics of suspicious lymph nodes (e.g., mobility, fixation), but is not based on the number of involved lymph nodes. In contrast, the postoperative pN status depends on the number of metastatic lymph nodes. Interestingly, Loveland-Jones et al. reported that presentation with ≥4 abnormal nodes on ultrasound did not predict higher false-negative rate of TAD [63].

The recommendation to perform TAD in patients with occult breast cancer and axillary metastasis (axCUP) was newly introduced into the AGO guidelines (AGO +). In addition, TAD was also acknowledged as an individual option in selected patients with inflammatory breast cancer (AGO +/−).

Recently published data from 2596 patients included in the AXSANA study showed that the detection rate of the target lymph node (TLN) was highest in patients whose TLNs were marked with a marker suitable for probe-guided detection before NACT [64]. The use of clips for TLN marking is associated with higher rates of marker loss [65–70]. Therefore, probe-guided detection is rated as highly effective in the updated recommendations (AGO +). The most prominent suspicious node should be marked, while the decision to mark more nodes in case of higher nodal involvement should be made on a case-by-case basis (AGO +/−) (Fig. 3).

ALND should be performed in patients who remain clinically node-positive after NACT (cN+) (AGO +). It is worth noting that more than 20% of patients with residual suspicious lymph nodes upon ultrasound after NACT are, in fact, ypN0 [71]. In patients with clinically node-negative disease and macrometastatic SLN/TLN involvement (≥ypN1a), ALND is the preferred treatment modality (AGO +). The ongoing randomized Alliance 11,202 study compares completion ALND with regional radiotherapy in patients with residual nodal disease after NACT and will provide high-level evidence on the optimal treatment. Despite substantial additional lymph node involvement in the case of a microscopic SLN/TLN involvement, a completion ALND does not provide meaningful information for post-neoadjuvant treatment modifications [72,73]. According to a large retrospective analysis, ALND showed no benefit in disease-free survival or overall survival for patients with microscopic nodal involvement after NACT [74]. Therefore, the AGO Breast Committee does not recommend ALND in patients with ypN1mi (sn/tad) status as standard of care (AGO +/−). If only isolated tumor cells are identified (ypN0(i+) [sn/tad]), ALND should not be performed (AGO -) [72,75].

Axillary Surgery in the setting of NACT (cN+)

cN status (before NACT)	pN status (before NACT)	ycN status (after NACT)	Axillary surgery (after NACT)	AGO	ypN status (after NACT and surgery)	Surgical consequence based on histopathology	Oxford		AGO
							LoE	GR	
cN+ *	$pN+_{CNB}$	ycN0	ALND	+/-	ypN0 / ypN+	None	2b	B	++
			TAD	++ **	ypN0	None	2b	B	+
					ypN0 (i+)	ALND	2b	B	-
					ypN1mi	ALND	2b	B	+/-
					ypN+	ALND	2b	B	+
			SLNE	+	ypN0	None	2b	B	+
					ypN0 (i+)	ALND	2b	B	-
					ypN1mi	ALND	2b	B	+/-
					ypN+	ALND	2b	B	+
			TLNE	+	ypN0	None	2b	B	+
					ypN0 (i+)	ALND	3b	B	-
					ypN1mi	ALND	2b	B	+/-
					ypN+	ALND	2b	B	+
		ycN+ ***	ALND	+	ypN0 / ypN+	None	2b	B	++

* Study participation in AXSANA recommended; ** in case of initially 1-3 suspicious nodes; *** Cave: In 21.1% false-positive findings, consider CNB/TAD.

Fig. 2. Current recommendations of the AGO Breast Committee regarding axillary surgery in patients with initially node-positive breast cancer in the neo-adjuvant setting.

Targeted Axillary Dissection (TAD) = TLNE + SLNE

	Oxford		
	LoE	GR	AGO
▪ Core needle biopsy and marking of suspicious lymph nodes	2b	B	++
▪ Marking of multiple nodes if more than one node is suspicious	2b	B	+/-
▪ TLN detection rate is highest when markers suitable for probe-guided detection are used before NACT*	2b	B	+
▪ TAD in case of 1-3 suspicious nodes before NACT and ycN0	2b	B	++
▪ TAD in case of ≥ 4 suspicious nodes before NACT and ycN0	2b	B	+
▪ TAD in case of inflammatory breast cancer and cN1 → ycN0	3b	C	+/-
▪ TAD in case of occult breast cancer (axCUP) and ycN0	3b	C	+
▪ Full workup using step sections of ≤ 500 µm on paraffin embedded tissue	5	D	++
▪ Immunohistochemistry for ITC detection	2b	D	-
▪ SLNE alone in case of a non-detectable TLN and ycN0	5	D	+
▪ ALND in case of pre- or intraoperatively non-detectable TLN and SLN	5	D	+
▪ Further intervention to retrieve lost marker (incl. after ALND)	5	D	-

* Study participation in AXSANA recommended.

Fig. 3. Current recommendations of the AGO Breast Committee regarding targeted axillary dissection.

4. Oncoplastic surgery and breast reconstruction

4.1. Oncoplastic surgery

The definition of oncoplastic surgery (OPS) remains unchanged in the updated AGO treatment recommendations and refers to the use of plastic surgical techniques at the time of tumor removal to enhance aesthetic and quality of life outcomes without compromising oncological safety with the focus on favorable scar placement, adequate soft tissue formation, selection of an appropriate reconstructive technique (considering radiation therapy), and contralateral symmetrization.

Compared to BCS, OPS has the same oncological safety and a similar complication rate [76–79]. In addition, in selected cases, OPS can replace mastectomy, particularly in the presence of multifocal and multicentric disease [80,81]. In breast hypertrophy, tumor-adapted reduction mammaplasty before radiotherapy is associated with fewer complications than secondary reduction surgery after irradiation; however, secondary reduction appears feasible in terms of complication rate [82].

A recently published systematic review and meta-analysis, including 17 studies and 1893 chest wall perforator flaps (CWPF) for partial breast reconstruction in patients receiving BCS, demonstrated oncological safety of the procedure [83]. The most frequently used flap was the lateral intercostal artery perforator (LICAP) flap (1016 cases), followed by the lateral thoracic perforator (LTAP) flap (297 cases), and the anterior intercostal artery perforator (AICAP) flap in 192 patients. The

recipient-site complication rate was 13% and similar across different flap types. Flap loss occurred rarely (1%), and patient satisfaction was high. In 13%, re-excision was necessary for oncological reasons, and completion mastectomy was performed in 1.5% of patients. CWPF may be offered to avoid a mastectomy or contralateral symmetrization surgery, especially in patients with small to medium-sized breasts.

4.2. Breast reconstruction after mastectomy: techniques and current developments

Aesthetic flat closure (AFC) has become an increasingly popular option among patients who choose not to undergo breast reconstruction following mastectomy. Despite its growing acceptance, there remains a paucity of robust evidence to inform optimal surgical techniques or to comprehensively assess patient-reported outcomes [84,85]. With regard to reconstructive options following mastectomy, implant-based (heterologous) reconstruction as well as autologous techniques—including pedicled and free flap procedures—are recommended with an equal level of recommendation. (AGO +). The choice of method should be guided by individual patient factors, tumor characteristics, and, most importantly, the patient's preferences and expectations [86,87].

4.3. Infection prevention

Current guidelines recommend limiting perioperative intravenous antibiotic prophylaxis to a maximum of 24 h [88–90].(AGO +) While a meta-analysis published in 2024, encompassing 19,301 patients, indicated that extended antibiotic prophylaxis may confer some benefits compared with intraoperative administration alone or regimens limited to 24 h [91], in light of notable methodological limitations and potential sources of bias within several of the included studies, prolonged intravenous antibiotic therapy beyond 24 h should be considered only as an alternative approach rather than routine practic (AGO +/−).

Furthermore, the intraoperative topical administration of a prophylactic antibiotic (e.g., gentamicin) and/or the use of an antiseptic rinse is recommended (AGO +). An emerging approach involves collecting a culture from the surgical drainage seven days postoperatively and initiating targeted antibiotic therapy guided by the resulting antibiogram. This personalized strategy can be considered on an individual, case-by-case basis [92] (AGO +/−).

4.4. Prevention of seroma and hematoma

In recent years, the number of publications and the corresponding evidence supporting the use of tranexamic acid for seroma prevention, as well as for reducing postoperative bleeding in implant-based reconstruction, has grown continuously. The benefits of tranexamic acid have now been demonstrated also in complex breast surgery, such as mastectomy, tumor-adapted reduction mammaplasty, or other oncoplastic procedures. Tranexamic acid can be applied topically or systemically (IV/oral) (AGO +). Possible regimens include IV administration within the first 24 h, followed by oral dosing (total 1–3 g over 1–5 days) or topical application of 3 g in 100 ml NaCl intraoperatively [93–96]. Glucocorticoids to reduce the risk of seroma may also be considered (AGO +/−). A recently published meta-analysis suggests that methylprednisolone (IV 100–125 mg, given 1 h before surgery or locally with 80 mg delivered through the drain into the wound cavity with the drain clamped for 24 h) or 100 mg hydrocortisone IV immediately prior to surgery can be recommended (AGO +/−) [97].

4.5. Direct-to-implant reconstruction

Unfortunately, in skin-sparing (SSM) or nipple-sparing mastectomy (NSM), large prospective randomized controlled trials comparing acellular dermal matrices (ADM) versus absorbable or non-absorbable (titanium-coated TiLOOP) meshes versus no mesh are still lacking. Therefore, the AGO Breast Committee cannot issue a differentiated recommendation for one approach over another. However, based on current literature and clinical practice, the rate of major complications appears to be higher with ADM use than with mesh alone [98,99]. Zhang et al. demonstrated in a meta-analysis that seroma rates, infections, and implant losses were higher with ADM use than with a titanium-coated TiLOOP mesh [100].

Endoscopic techniques in breast surgery have gained increasing popularity, particularly for NSM. Endoscopic or robot-assisted NSM has been performed predominantly in Asia over the past decade but has gradually gained traction in Europe (AGO +/−). Before initiating these techniques, a standard of care should be established. The 2025 consensus by Ryu et al. summarizes indications and contraindications well: indication for ≤ cT2, cN0, ≤ cup-C, tumor distance to skin >5 mm; contraindications include invasion of the nipple-areolar complex, a T4 tumor, inflammatory carcinoma, and marked ptosis [101].

ICG for the prevention of mastectomy flap necrosis can provide intraoperative assessment of skin perfusion. A recent published meta-analysis from 8 studies with 1252 patients reported a significant reduction of skin flap necrosis, severe flap necrosis and reoperation. Given the robust data, AGO hence recommends the use of ICG with a grade of recommendation AGO + [102]. The only other technique graded AGO + for prevention of skin flap necrosis is locally used nitroglycerin [103]. Negative pressure wound therapy (NPWT) has been investigated recently amongst other trials in a meta-analysis of 31 studies (8 RCTs and 23 observational studies) for preventing wound-healing disturbances, mastectomy flap necrosis, and infection of the operative field, particularly in patients with BMI >30, and may be used on a case-by-case basis (AGO +/−) [104,105].

4.6. Autologous fat grafting (AFG)

If implant-based reconstruction is not desired or only a volumetric deficit needs to be addressed, autologous fat transfer is considered. There is now a wide range of indications, including improving skin trophicity after radiotherapy, rehabilitating a volumetric defect after nipple-sparing mastectomy or BCS, or rebuilding an entire breast with fat. There is no evidence requiring a specific interval to be observed after breast cancer surgery before fat grafting. Data on whether fat grafting increases recurrence risk when two years elapse between BCS and AFG exist only in animal models [106].

4.7. Autologous breast reconstruction

The deep inferior epigastric artery perforator (DIEP) flap is certainly the standard for autologous breast reconstruction with a free flap (AGO ++). Other options include the free gracilis flap (transverse myocutaneous gracilis, TMG) (AGO +) [107] or the profunda artery perforator (PAP) flap (AGO +) [108,109], the latter two serving as secondary options.

5. Summary

In the 2026 update of the AGO Breast Committee recommendations, the focus of the surgery-related chapters was on reducing the extent of surgical therapy in the axilla. Omitting SLNB should be recommended in patients with low-risk breast cancer treated with upfront BCS with whole-breast irradiation, in whom the detection of a macrometastatic sentinel node would not impact postoperative therapy. In the neoadjuvant setting, substantial modifications to the recommendations concerning de-escalated axillary surgery in patients with initially node-positive disease were endorsed. For patients with 1-3 suspicious nodes at diagnosis and converting to ycN0, TAD is the technique of choice (AGO ++), but SLNB and TLND are also possible options (AGO +). Marking of target lymph node(s) with markers suitable for probe-guided detection before NACT may increase detection rates and rates of a successful TAD/

TLNB.

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