Guidelines Breast
Version 2021.1E

Breast Cancer Surgery
Oncological Aspects

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- **Versions 2002–2020:**
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- **Version 2021:**
  Ditsch /Fallenberg / Friedrich

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Breast Cancer Surgery
Oncological Aspects

AGO: ++

Surgery is one sub-step out of multiple steps in breast cancer treatment. Thus, both diagnostic and oncological expertise are an essential requirement for every breast surgeon.

AGO: +

Avoidance of a significant delay in cancer treatment

Pre-therapeutic Assessment of Breast and Axilla

	Oxford LoE	Oxford GR	AGO
▪ Clinical examination	5	D	++
▪ Mammography	2b	B	++
▪ Tomosynthesis (DBT)***	2b	B	+
▪ Contrast-enhanced mammography (alone or as adjunct)	2a	B	+
▪ Sonography (breast and axilla)	2b	B	++
▪ MRI*	1b	B	+
▪ Minimally invasive biopsy**	1b	A	++
▪ Axilla CNB, if lymph node is suspect	2b	B	++
▪ Breast-CT	5	D	-

* MRI-guided vacuum biopsy is mandatory in case of MRI-detected additional lesions (in house or with cooperations). Individual decision for patients at high familiar risk, with dense breast (density C/D), lobular invasive tumors, suspicion of multilocular disease. No reduction in re-excision rate.

** Histopathology of additional lesions if relevant for treatment

*** replacement of FFDM with SM

Pre-therapeutic Staging

	Oxford LoE	Oxford GR	AGO
▪ History and clinical examination	5	D	++
Additional diagnosis for patients with tumors of high metastatic potential and/or symptoms and/or indication for (neo-)adjuvant chemotherapy and/or antibody-therapy):			
▪ CT scan of thorax/abdomen	2a	B	+
▪ Bone scan	2b	B	+
▪ Chest X-ray	5	C	+/-
▪ Liver ultrasound	5	D	+/-
▪ In case of suspicious lesions further diagnosis (e.g. liver-MRI, CEUS*, biopsy etc.)	2a	B	+
▪ FDG-PET or FDG-PET /CT**	2b	B	+/-
▪ Whole body MRI	4	C	+/-

* Contrast enhanced ultrasound

**especially in patients with high tumor stage (III) if available

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Evidence of Surgical Procedure

	Oxford	
	LoE	GR
▪ Survival rates after lumpectomy + RT are equivalent to those after (modified) radical mastectomy	1a	A
▪ Local recurrence rates after skin sparing mastectomy are equivalent to those after mastectomy	2b	B
▪ Conservation of the NAC (nipple areola complex) is an adequate surgical procedure if R0 resection is achieved	2b	C

Breast Conservation: Surgical Technical Aspects

	Oxford		
	LoE	GR	AGO
▪ Wire guided localization	2b	B	++
▪ Wireless intraoperative ultrasound localization*	2b	B	+
▪ Other procedures (Radionuclide guided localization/RADAR reflection, Magnetic Seeds**, RFID)	2a	B	+/-

*The lesion must be visualized by the same examiner pre- and intraoperatively in its whole extension. Adequate equipment and training of the surgeon are mandatory
**not adequate for MRI-FU under NACT

Breast Conservation: Surgical Technical Aspects

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	Oxford		
	LoE	GR	AGO
▪ **Tumor-free margins required** (also in unfavorable biology, „no ink on tumor“ is sufficient)	2a	A	++
▪ **Re-excision required for involved margins (paraffin section)**	3b	C	+
▪ **Therapeutic stereotactic excision alone**	4	D	--
▪ **Ultrasound guided surgery to prevent re-excision**	2a	B	+
▪ **Intraoperative margin evaluation (with Margin Probe®)**	1b	A	+/-
▪ **Specimen radiography or ultrasound**	2b	B	++

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Breast Conservation Surgery (BCS)

	Oxford		
	LoE	GR	AGO
▪ Multicentric disease (MF/MZ) (R0-resection of all lesions)	2b	B	+
▪ Positive microscopic margins after repeated excision	2b	B	--
▪ Inflammatory breast cancer	2b	B	--

For surgery after neoadjuvant chemotherapy see chapter „neoadjuvant chemotherapy“

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Primary Axillary Lymph Node Dissection (ALND) I

	Oxford		
	LoE	GR	AGO
▪ **Endpoint: Survival**	3	D	-
▪ **Endpoint Staging**	3	A	-
▪ **Endpoint: Locoregional control**	2a	A	+/-
▪ **pN+ (pre-surgery) without neoadjuvant systemic therapy**	2a	B	+
▪ **cN0 pN0(sn)(i+)**	1b	A	--
▪ **cN0 pN1(mi)**	2b	B	--
▪ **cN0 pN 1(sn) (cT1/2 , < 3 SN +, BCS + tangential radiation field, adequate systemic therapy)**	1b	A	-
▪ **cN0 pN1 (sn) and mastectomy (no chestwall radiotherapy)**	1b	B	+*
▪ **cN0 pN1(sn) and mastectomy (T1/2, <3SN+) (chestwall radiotherapy)**	5	D	+/-*
▪ **ALND indicated, but not feasible**			
▪ **Radiotherapy according to AMAROS-trial (validated for cN0 pN1sn)**	1b	B	+

* **Study participation recommended**

Axillary Surgery and NACT

	Oxford		
	LoE	GR	AGO
SLNE after NACT	2b	B	++
SLNE before NACT	2b	B	-

cN-Status (before NACT)	pN-Status (before NACT)	cN-Status (after NACT)	Surgical procedure (after NACT)	pN-Status (after NACT and Surgery)	Surgical consequence from histology**			
cN0	—	ycN0	SLNE alone	ypN0 (sn)	—	2b	B	++***
				ypN0 (i+) ypN1$_{mic}$ (sn)	ALND	2b	C	+ (+/- at i+)
					none **	5	D	+/-
				ypN1 (sn)	ALND	2b	C	++
					none **	5	D	+/-
cN+	pN+$_{CNB}$	ycN0	SLNE alone* TAD (TLNE + SLNE)* ALND*	ypN0 ypN0 ypN0	—	2b 2b 2b	B B B	+/-*** +*** +***
			SLNE alone* TAD (TLNE + SLNE)*	ypN+ incl. ypN0 (i+)	ALND	2b	B	+ (+/- at i+)
			ALND	ypN+	—	2b	B	++
			none	n.d.	none**	5	D	-
cN+	pN+$_{CNB}$	ycN+	ALND	ypN+ incl. ypN0 (i+)	—	2b	B	++
			none	n.d.	none**	5	D	-

*Study participation (Axsana) recommended; ** s. Recommendations chapter Radiotherapy, irradiation alone is not recommended in case of pN1(sn) and pN+ ; ***recommendation grade concerning to staging at cN0 and cN+ ypN0

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Improvement of the False-Negative Rate of SLNE in Patients with $pN+_{CNB}$ before NACT and ycN0 after NACT

	Oxford		
	LoE	GR	AGO
▪ Removal of > 2 SLNs (SLNE, no untargeted axillary sampling)	2a	B	+
▪ Combined tracer	2a	B	+/-
▪ IHC and serial sections to detect ITC or micrometastases	2b	B	+
▪ Localization of pos. LN before NACT	2b	B	+*
▪ Targeted Axillary Dissection (TAD = TLNE + SLNE)	2b	B	+*
▪ TLNE only	2b	B	+/-*

*** Study participation recommended**

Reduction of individual failures for SLNB in pN1 ypN0

- **Predictive factors for axillary remission pN1 (before NACT) to $ypN0_{sn/TAD}$(after NACT)**
  - **Young age**
  - **Intrinsic Subtype (ER neg, HER 2 pos)**
  - **Grade 3**
  - **N1 (vs N2)**
  - **pCR (breast)**

Kantor et al. Ann Surg Oncol 2018

Sentinel Lymph Node Excision (SLNE)
Indications I

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	Oxford		
	LoE	GR	AGO
▪ **Clinically / sonographically negative axilla (cN0)**	1b	A	++
▪ **Add CNB in cN1 (clinically/sonographically suspicious) in order to enable SLNB**	2a	B	+
▪ **cT 1–2**	2b	A	++
▪ **cT 3–4c**	3b	B	+
▪ **Multifocal / multicentric lesions**	2b	B	+
▪ **DCIS**			
▪ **Mastectomy**	3b	B	+
▪ **BCT**	3b	B	-
▪ **DCIS in male**	5	D	+/-
▪ **Male breast cancer**	2b	B	+
▪ **In elderly patients**	3b	B	+

Sentinel Lymph Node Excision (SNLE) Indications II

	Oxford		
	LoE	GR	AGO
▪ During pregnancy and / or breast feeding (only ^{99m}Tc-colloid, no blue dye)	3	C	++
▪ After prior tumor excision	2b	B	+
▪ After prior major breast surgery (e.g. reduction mammoplasty)	3b	C	+/-
▪ Ipsilateral breast recurrence after prior BCS and prior SNLE	4	D	-
▪ SLNE in the mammary internal chain	2b	B	-
▪ After axillary surgery	3b	B	+/-
▪ Prophylactic bilateral / contralateral mastectomy	3b	B	--
▪ Inflammatory breast cancer	3b	C	-

Sentinel Lymph Node Excision (SLNE) Marking

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	Oxford		
	LoE	GR	AGO
▪ ^{99m}Tc colloid	1a	A	++
▪ Preoperative lymphoscintigraphy (added infomation limited, but mandatory by legal regulations)*	1b	A	+
▪ Patent blue dye	1a	A	+/-
▪ Methylen blue	4	D	-
▪ Indocyanin green (ICG)	2a	B	+/-
▪ SPIO#	2a	B	+/-

* In Germany required for quality assurance of nuclear medicine

\# SPIO: Superparamagnetic Iron Oxide

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Procedure after Neoadjuvant Therapy

	Oxford		
	LoE	GR	AGO
▪ Early marking of tumor (incl. detailed topographic documentation)	5	D	++
▪ Surgical removal of tumor / representative excision of post-therapeutic, marked tumor area	2b	C	++
▪ Tumor resection in new margins	2b	C	++
▪ Microscopically clear margins	2a	B	++

For „Surgery after neoadjuvant chemotherapy“
see chapter „Neoadjuvant chemotherapy“

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Adjuvant Therapy after Primary Surgery

	Oxford		
	LoE	GR	AGO
▪ Start adjuvant systemic therapy and radiotherapy (RT) as soon as possible (asap) after surgery	1b	A	++
▪ Start of adjuvant chemotherapy +/- HER2 therapy asap after surgery, prior to RT	1b	A	++
▪ Without cytotoxic therapy +/- anti-HER2 therapy:			
▪ Start RT 6–8 weeks after surgery	2b	B	++
▪ Start endocrine therapy asap after surgery	5	D	++
▪ Endocrine therapy concurrent with radiotherapy	3b	C	+