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Diagnosis and Treatment of Patients with early and advanced Breast Cancer

Oncoplastic and Reconstructive Surgery



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Plastic-Reconstructive Aspects after Mastectomy


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Definition of Oncoplastic Surgical Procedures

Use of plastic surgical techniques at the time of tumor removal to enable safe resection margins and to preserve aesthetic breast contour.

Focus on favorable scar placement, adequate soft tissue formation, choice of proper reconstruction procedure (including in the context of radiation) and reconstruction of the contralateral side to achieve symmetric results.


1. Abhishek Chatterjee , Jennifer Gass , Krishnabhai Patel et al.; A Consensus Definition and Classification System of Oncoplastic Surgery Developed by the American Society of Breast Surgeons. Ann Surg Oncol. 2019 Oct;26(11):3436-3444.
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3. Kuerer H et al. Optimizing breast cancer adjuvant radiation and integration of breast and reconstructive surgery. ASCO Educational Book 2017



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Classifications

1. By Hoffmann / Wallwiener:


Classification by reconstructive surgery complexity with respect to breast conservation and mastectomy: PubMed Central, Figure 1: BMC Cancer. 2009; 9: 108. Published online 2009 Apr 8. doi: 10.1186/1471-2407-9-108 (nih.gov)

2. By Clough:

Oncoplastic classification for breast conservation according to relative resection volume: Level 1: < 20 % of breast volume resection („simple oncoplastic surgery“) and Level 2 > 20 % of breast volume resection with quadrant per quadrant techniques of mastopexy.

Hoffmann D et al., BMC 2009; Clough KB et al., Ann Surg Oncol 2010


1. Hoffmann D et al Classifying breast cancer surgery: a novel, complexity-based system for oncological, oncoplastic and reconstructive procedures, and proof of principle by analysis of 1225 operations in 1166 patients. BMC Cancer. 2009 Apr 8;9:108. doi: 10.1186/1471-2407-9-108.
2. Clough KB et al Improving breast cancer surgery: a classification and quadrant per quadrant atlas for oncoplastic surgery. Ann Surg Oncol. 2010 May;17(5):1375-91. doi: 10.1245/s10434-009-0792-y. Epub 2010 Feb 6.
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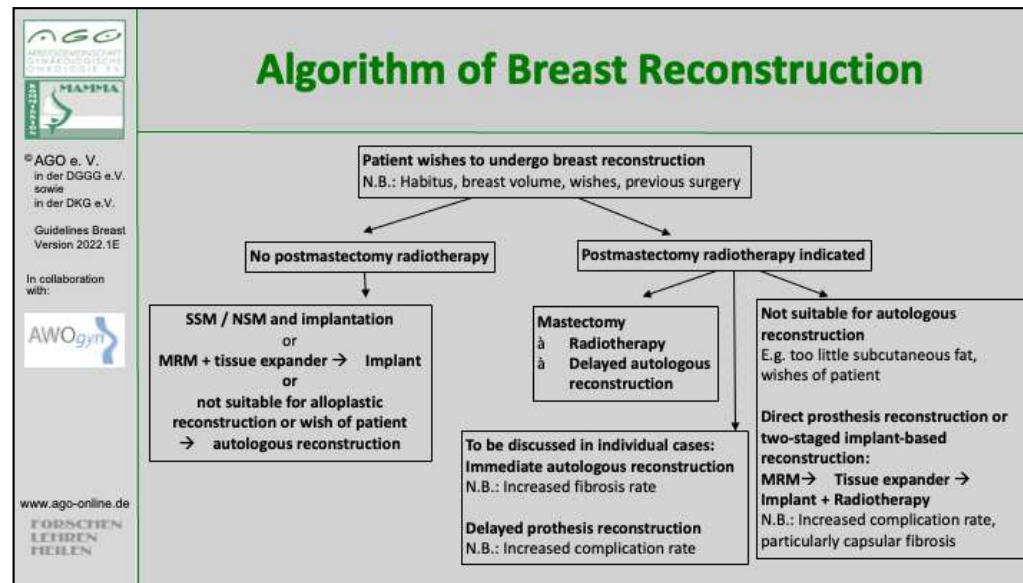
Oncoplastic Breast Conserving Surgery (OPS)

	Oxford		
	LoE	GR	AGO
▪ OPS may replace mastectomy in selected patients	2b	B	+
▪ OPS and BCS are oncologically similar	2b	B	+
▪ Complication rates of OPS and BCS are similar	3b	C	+

1. Florian Fitzal, Michael Bolliger, Daniela Dunkler Retrospective, Multicenter Analysis Comparing Conventional with Oncoplastic Breast Conserving Surgery: Oncological and Surgical Outcomes in Women with High-Risk Breast Cancer from the OPBC-01/iTOP2 Study. Ann Surg Oncol. 2021 Oct 13. doi: 10.1245/s10434-021-10809-1.
2. Gulcelik MA et al Feasibility of level II oncoplastic techniques in the surgical management of locally advanced breast cancer after neoadjuvant treatment. Int J Clin Pract. 2021 Jan 6;e13987. doi: 10.1111/ijcp.13987.
3. Kosasih S et al Is oncoplastic breast conserving surgery oncologically safe? A meta-analysis of 18,103 patients. Am J Surg. 2020 Aug;220(2):385-392. doi: 10.1016/j.amjsurg.2019.12.019. Epub 2020 Jan 2.
4. Aristokleous I et al Quality of life after oncoplastic breast-conserving surgery: a systematic review. ANZ J Surg. 2019 Jun;89(6):639-646. doi: 10.1111/ans.15097. Epub 2019 Apr 12.
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Plast Surg. 2016 May;76 Suppl 3:S222-6. doi: 10.1097/SAP.0000000000000720.

7. Wiggman DJ et al Short term safety of oncoplastic breast conserving surgery for larger tumors. Eur J Surg Oncol. 2017 Apr;43(4):665-671. doi: 10.1016/j.ejso.2016.11.021. Epub 2016 Dec 18.
8. Crown A et al Oncoplastic Breast-Conserving Surgery Reduces Mastectomy and Postoperative Re-excision Rates. Ann Surg Oncol. 2015 Oct;22(10):3363-8. doi: 10.1245/s10434-015-4738-2. Epub 2015 Jul 25.



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3. Kuerer H, et al. Optimizing breast cancer adjuvant radiation and integration of breast and reconstructive surgery. ASCO Educational Book 2017; Memorial Sloan Kettering Cancer Center, Fig. 2 und 3
4. Cordeiro P, et al. What is the optimum timing of postmastectomy radiotherapy in two-stage prosthetic reconstruction: radiation to the tissue expander or permanent implant? Plast Reconstr Surg. 2015 Jun;135(6):1509-1517. doi: 10.1097/PRS.0000000000001278.PMID: 25742523
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Review and Meta-analysis. Plast Reconstr Surg Glob Open. 2020 Oct 29;8(10):e3120. doi:
10.1097/GOX.00000000000003120. eCollection 2020 Oct. PMID: 33173667



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Breast Reconstruction Principles Good Clinical Practise

AGO: ++

- Planning of reconstructive procedure by interdisciplinary tumor board before mastectomy
- Counseling regarding all surgical techniques, including advantages and disadvantages
- Preference for autologous reconstruction after radiotherapy or if radiotherapy is planned
- Offer second opinion
- Discussion of neoadjuvant treatment if unfavorable tumor-breast-relation
- Consideration of contralateral breast;
 - discuss possible alignment / sequencing surgical procedures to produce symmetry; usually after at least 3-6 months (Caveat: need for post-resections, consider effects of radiotherapy for affected side)
- Preference for less stressful surgical technique with stable long-term esthetic result (prefer BCS / OPS over mastectomy)
- Avoid delay of adjuvant therapy due to reconstruction
- Assessment of outcome, e.g. Patient Reported Outcome (PRO)
- Oncologic safety is not impaired

1. AWMF Leitlinien: S3-LL. Brustrekonstruktion mit Eigengewebe. Registernummer 015 – 075, Stand: 01.04.2015 , gültig bis 31.03.2020?
2. Bertozzi N et al. Oncoplastic breast surgery: comprehensive review. Eur Rev Med Pharmacol Sci. 2017; 21(11):2572-2585.
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7. Khajuria A, Prokopenko M, Greenfield M et al. Meta-analysis of Clinical, Patient-Reported Outcomes

and Cost of DIEP versus Implant-based Breast Reconstruction. *Plast Reconstr Surg Glob Open* 2019;7:e2486

8. Phan R, Hunter-Smith DJ, Rozen WM. The use of Patient Reported Outcome Measures in assessing patient outcomes when comparing autologous to alloplastic breast reconstruction: a systematic review. *Gland Surg* 2019;8(4):452-460

Postmastectomy Reconstruction			
	Oxford		
	LoE	GR	AGO
<ul style="list-style-type: none"> Use of silicone gel filled breast implants one step or two steps after expander <ul style="list-style-type: none"> Safety comparable to saline implants 	2a	B	+
<ul style="list-style-type: none"> Autologous tissue reconstruction 	2a	B	+
<ul style="list-style-type: none"> Pedicled tissue reconstruction 	2a	B	+
<ul style="list-style-type: none"> Free tissue reconstruction (including vascular anastomoses) 	2a	B	+
<ul style="list-style-type: none"> Autologous tissue procedure plus implants 	3a	C	+/-
Caveat: BMI > 30, smoking status, diabetes, radiotherapy, age, bilateral mastectomy			

1. Wilkins EG, et al. Complications in Postmastectomy Breast Reconstruction: One-year Outcomes of the Mastectomy Reconstruction Outcomes Consortium (MROC) Study. Ann Surg. 2018 Jan;267(1):164-170. doi: 10.1097/SLA.0000000000002033.PMID: 27906762
2. Zhu L, et al. Comparison of subcutaneous versus submuscular expander placement in the first stage of immediate breast reconstruction. J Plast Reconstr Aesthet Surg. 2016; 69(4):e77-86.
3. Singh N, et al. Five-Year Safety Data for More than 55,000 Subjects following Breast Implantation: Comparison of Rare Adverse Event Rates with Silicone Implants versus National Norms and Saline Implants. Plast Reconstr Surg. 2017; 140(4):666-679.
4. Potter S et al. Short-term safety outcomes of mastectomy and immediate implant-based breast reconstruction with and without mesh (iBRA): a multicentre, prospective cohort study. Lancet Oncol 2019 Jan 9. pii: S1470-2045(18)30781-2.
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Timing of Reconstruction			
	Oxford		
	LoE	GR	AGO
<ul style="list-style-type: none"> Immediate breast reconstruction <ul style="list-style-type: none"> Mandatory: SSM / NSM Avoidance of a postmastectomy syndrome Delayed breast reconstruction (2-step) <ul style="list-style-type: none"> No interference with adjuvant procedures (CHT, RT) Disadvantage: loss of skin envelope „Delayed-immediate“ breast reconstruction (placeholder before definitive reconstruction) 	3b	B	++
	3b	B	++
	3b	B	+

1. Jagsi R et al. Complications After Mastectomy and Immediate Breast Reconstruction for Breast Cancer: A Claims-Based Analysis. Ann Surg. 2016; 263(2):219-27.
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5. Zhong T et al. A Comparison of Surgical Complications Between Immediate Breast Reconstruction and Mastectomy: The Impact on Delivery of Chemotherapy-An Analysis of 391 Procedures. Ann Surg Oncol. 2012; 19(2):560-6.
6. D'Souza N et al. Immediate versus delayed reconstruction following surgery for breast cancer. Cochrane Database Syst Rev. 2011; (7):CD008674.
7. Srinivasa DR et al. Direct to implant versus two stage tissue expander/implant reconstruction: 2 year

risks and patient reported outcomes from a prospective, multicenter study. *Plast Reconstr Surg.* 2017; 140(5):869-877.

8. Negenborn VL, Young-Afat DA, Dikmans REG et al: Quality of life and patient satisfaction after one-stage implant-based breast reconstruction with an acellular dermal matrix versus two-stage breast reconstruction (BRiOS): primary outcome of a randomised, controlled trial. *Lancet Oncol* 2018 Sep;19(9):1205-1214.

Timing of implant Based Reconstruction and Radiotherapy			
	Oxford		
	LoE	GR	AGO
■ Implant reconstruction (IR)	2a	B	+
■ IR without radiotherapy	2a	B	++
■ IR prior to radiotherapy	2a	B	+
■ IR following radiotherapy	2b	B	+/-
■ IR following secondary mastectomy (after BCS* with radiotherapy)	2a	B	+/-
■ Perioperative antibiotic prophylaxis (max. 24 hours)	2a	B	+

* BCS: Breast Conserving Surgery

Radiation:

1. Santosa KB et al. Postmastectomy Radiation Therapy and Two-Stage Implant-Based Breast Reconstruction: Is There a Better Time to Irradiate? *Plast Reconstr Surg.* 2016; 138(4):761-9.
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5. Albornoz CR et al. Implant breast reconstruction and radiation: a multicenter analysis of long-term health-related quality of life and satisfaction. *Ann Surg Oncol.* 2014; 21(7):2159-64.
6. Valdatta L et al. Acellular dermal matrices and radiotherapy in breast reconstruction: a systematic review and meta-analysis of the literature. *Plast Surg Int.* 2014; 472604.
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21(5):1732-8.


8. Berbers J et al. Reconstruction: before or after postmastectomy radiotherapy? A systematic review of the literature. *Eur J Cancer*. 2014; 50(16):2752-62.
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13. Magill LJ et al. Determining the outcomes of post-mastectomy radiation therapy delivered to the definitive implant in patients undergoing one- and two-stage implant-based breast reconstruction: A systematic review and meta-analysis. *J Plast Reconstr Aesthet Surg*. 2017; 70(10):1329-1335.
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15. Batenburg MCT et al. on behalf of the UMBRELLA study group. Patient-reported cosmetic satisfaction and the long-term association with quality of life in irradiated breast cancer patients. *Breast Cancer Research and Treatment* <https://doi.org/10.1007/s10549-019-05470-y>

Prophylactic antibiotics:

1. Phillips BT, Halvorson EG. Antibiotic Prophylaxis following Implant-Based Breast Reconstruction: What Is the Evidence? *Plast Reconstr Surg*. 2016; 138(4):751-7.
2. Hunter JG. Discussion: Antibiotic Prophylaxis following Implant-Based Breast Reconstruction: What Is the Evidence? *Plast Reconstr Surg*. 2016; 138(4):758-9.
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based breast reconstruction: A matched cohort study. J Plast Reconstr Aesthet Surg. 2015; 68(5):673-8.


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Metaanalysis of Prophylactic Antibiotics > 24 h in Implant-based Immediate Breast Reconstruction (IBR)


- **11 studies (15,966 mastectomy procedures)**
- **Three studies comparing topical antibiotics with no topical antibiotics demonstrated statistical significance (RR = 0.26, 95% CI: 0.12–0.60, $P = 0.001$)**
- **8 studies comparing extended systemic antibiotics with standard of care found no statistical significance (RR = 0.80, 95% CI: 0.60–1.08, $P = 0.13$).**

LoE 2a B

In the setting of immediate breast reconstruction (IBR) following mastectomy, there is insufficient evidence for the use of extended prophylactic antibiotics to reduce surgical site infection (SSI) rates. Well-designed randomized controlled trials in patients undergoing IBR should be conducted to determine the appropriate regimen and/or duration of prophylactic antibiotics on SSI outcomes.

Hai Y et al. Plast Reconstr Surg Glob Open 2020;8:e2613; doi: 10.1097/GOX.0000000000002613.


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Radiotherapy and Implant-Based Reconstruction


Cave: High complication rate in combination with radiotherapy (capsular contracture, revision surgery, reconstruction failure, reduced cosmetic outcome and patient satisfaction)

Cave: Lower patient satisfaction with implant-based reconstruction plus radiotherapy compared to autologous reconstruction plus radiotherapy

LoE 2b B

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4. Naoum GE, Salama L, Niemierko A, et al. Single Stage Direct-to-Implant Breast Reconstruction Has Lower Complication Rates Than Tissue Expander and Implant and Comparable Rates to Autologous Reconstruction in Patients Receiving Postmastectomy Radiation. Int J Radiat Oncol Biol Phys. 2020 Mar 1;106(3):514-524. doi: 10.1016/j.ijrobp.2019.11.008. Epub 2019 Nov 19. PMID: 31756414
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6. Jagsi R et al. Impact of Radiotherapy on Complications and Patient-Reported Outcomes After Breast Reconstruction. J Natl Cancer Inst. 2018; 110(2).


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<https://doi.org/10.1016/j.ijrobp.2021.09.031>



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Possible Associations between Implants and Rare Diseases

- **US FDA Breast Implant Postapproval Studies (LPAS)**
Long-term Outcomes in 99,993 Patients
(Primary Augmentation: N = 71.937 / Primary Reconstruction: N = 9942)
 - 56% of implants were silicone implants
- **Possible Associations:**
 - Sjogren syndrome: (SIR* 8.14)
 - scleroderma: (SIR 7.00)
 - rheumatoid arthritis: (SIR 5.96)
 - stillbirth: (SIR 4.50)
 - melanoma: (SIR 3.71)
- At 7 years, reoperation rate is 11.7% for primary augmentation, and 25% for primary / revision reconstruction.
- One case of BIA-ALCL

Associations need to be further analyzed with
patient-level data to provide conclusive evidence!

* Standardized incidence ratio

Statistical Analysis:

LPAS data is expressed relative to normative population rates using standardized incidence ratios (SIRs)

Systemic harm rates in the study population are calculated per 10,000 person-years.


Normative population rates for systemic harms, self-harm, and reproductive outcomes are obtained from the literature; rates reflect LPAS demographics for female sex, age, and race in the United States.

1. Coroneos CJ et al. US FDA Breast Implant Postapproval Studies: Long-term Outcomes in 99,993 Patients. Ann Surg 2019 Jan;269(1):30-36.

Possible Associations between Implants and Rare Diseases							
Rare Systemic Harms Compared With the General Population:							
	Manufacturer	Study Events	Study Event Rate (Per 10,000 Person Yr)	General Population Event Rate (Per 10,000 Person Yr)	SIR	SIR 95% CI	P Value
Fibromyalgia	Allergan	9	1.8	112.8	0.02	0.01–0.03	< 0.001
	Mentor	307	28.4	112.8	0.25	0.22–0.28	< 0.001
Rheumatoid arthritis	Allergan	4	0.8	5.4	0.15	0.04–0.38	< 0.001
	Mentor	349	32.2	5.4	5.96	5.35–6.62	< 0.001
Scleroderma	Mentor	46	4.2	0.6	7.00	5.12–9.34	< 0.001
Sjogren syndrome	Mentor	62	5.7	0.7	8.14	6.24–10.44	< 0.001
Systemic lupus erythematosus	Allergan	3	0.6	5.4	0.11	0.02–0.32	< 0.001
	Mentor	66	6.0	5.4	1.11	0.86–1.41	0.398
Cancer	Allergan	80	16.0	41.3	0.39	0.31–0.48	< 0.001
	Mentor	532	63.8	41.3	1.54	1.42–1.68	< 0.001
Breast cancer	Mentor	116	13.9	12.5	1.11	0.92–1.33	0.26
Lung cancer	Mentor	5	0.6	5.2	0.12	0.04–0.27	< 0.001
Brain cancer	Mentor	3	0.4	0.6	0.67	0.14–1.95	0.639
Melanoma	Mentor	65	7.8	2.1	3.71	2.87–4.73	< 0.001
Neurological disorder	Allergan	18	3.6	22.5	0.16	0.09–0.25	< 0.001
	Mentor	394	35.8	22.5	1.59	1.44–1.76	< 0.001
Multiple sclerosis	Mentor	47	4.3	2.5	1.72	1.26–2.29	0.001
Myositis	Mentor	17	1.5	0.8	1.88	1.09–3.00	0.018

Allergan follow-up 2 years
Mentor follow-up 7 years


1. Coroneos CJ et al. US FDA Breast Implant Postapproval Studies: Long-term Outcomes in 99,993 Patients. Ann Surg 2019 Jan;269(1):30-36.



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Breast Implant Associated Anaplastic Large Cell Lymphoma (BIA-ALCL)


- Approximately 10.000.000 implant carrier
- Rare disease, 3% of Non-Hodgkin Lymphomas, 0.04-0.5% of all malignant breast diseases
- 1:3.000–30.000 in women with textured implants (caveat: underreporting!)
- Estimated incidence 0.6-1.2 / 100.000 women with implants (median age: 54 y)
- Mainly associated with textured implants
- Interval to diagnosis: 8 years (median)
- Clinical symptoms
 - Swelling and seroma. (60%)
 - Solid tumor (17%)
 - Seroma and solid tumor (20%)
- Histology: CD30+ / ALK-T-Cell Lymphoma
- Compulsory registration as SAE (§3 MPSV to BfArM)

Reviews

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BIA-ALCL - Surfaces of Breast Implants

- The cause of BIA-ALCL is not established; however, it has been proposed that lymphomagenesis may be driven by a chronic inflammatory reaction induced by capsule contents or surface. **The risk for BIA-ALCL has been shown to be significantly higher for implants with grade 3 and 4 surfaces.**

Process	Polyurethane foam	Salt Loss (Biocell/ Eurosilicone)	Gas Diffusion	Salt Loss (Nagotex)	Imprinting	Smooth/ Nano
Surface Area	high	intermediate	intermediate	low	low	minimal
Roughness	high	intermediate	low	low	low	minimal
SURFACE TYPE	4	3	3	2	2	1

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BIA-ALCL– Diagnosis			
	Oxford		
	LoE	GR	AGO
<ul style="list-style-type: none"> ■ Breast US (assessment of new seromas > 1 year after implant insert, solid lesion (sensitivity: 84%, specificity: 75%)) 	3a	D	++
<ul style="list-style-type: none"> ■ Mamma-MRT in confirmed cases 	3a	D	++
<ul style="list-style-type: none"> ■ Staging (Imaging, e.g. CT, PET-CT) 	3a	D	++
<ul style="list-style-type: none"> ■ Cytology of late seromas <ul style="list-style-type: none"> ■ > 50 ml ■ Complete assessment ■ flow-cytology (T-cell clone) ■ BIA-ALCL specific cytologic diagnostic (CD 30+) 	3a	D	++
<ul style="list-style-type: none"> ■ Core needle biopsy in solid lesions 	3a	D	++
<ul style="list-style-type: none"> ■ Lymphoma assessment of resected tissue and histologic staging 			
<ul style="list-style-type: none"> ■ Documentation of the implant (manufacturer, size, volume, surface, Batch-number) and enter in registry 	5	D	++

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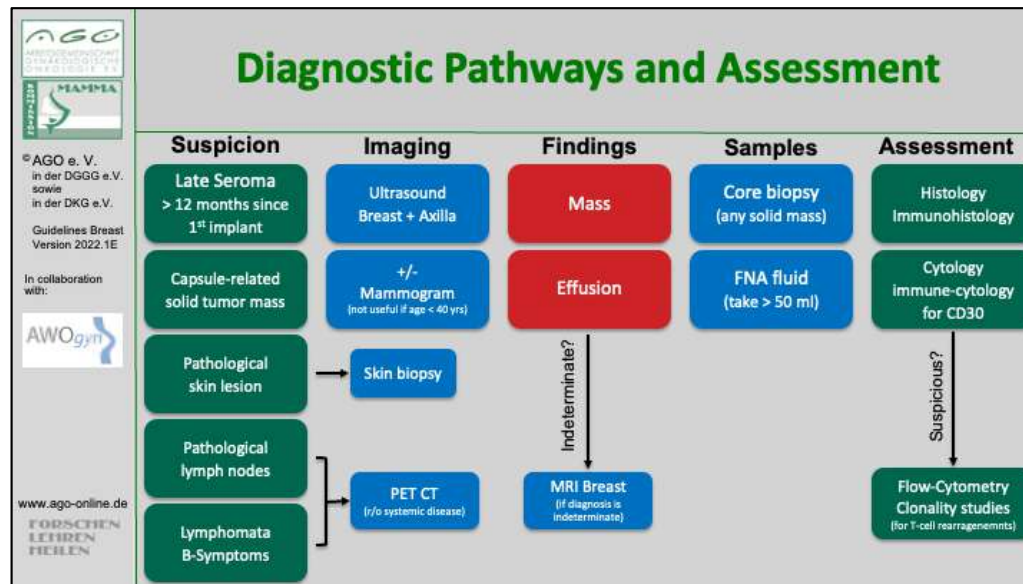
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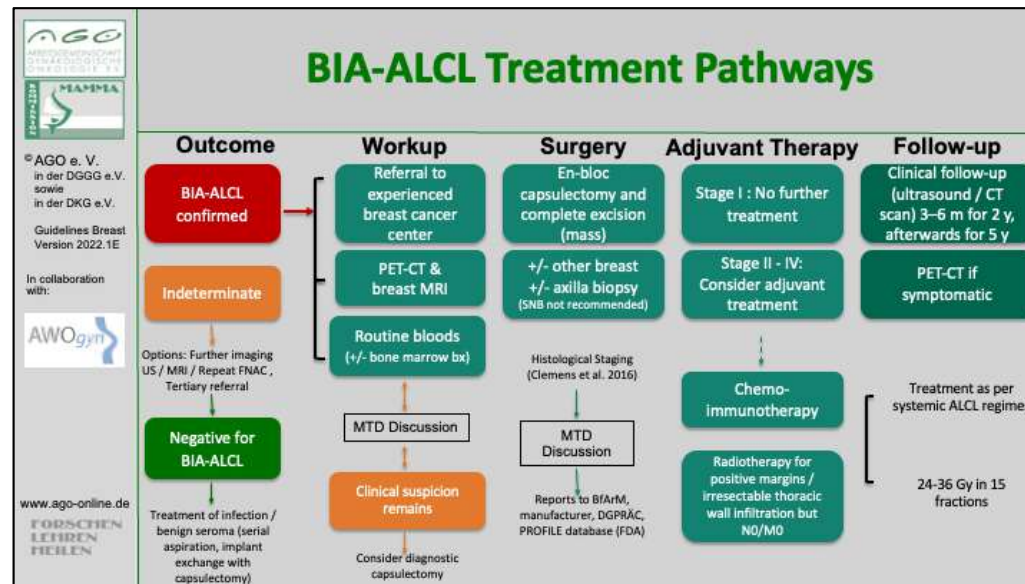
BIA-ALCL – Therapy			
	Oxford		
	LoE	GR	AGO
■ Implant resection and complete capsulectomy including tumorectomy	3a	C	++
■ Resection of suspicious lymph nodes, no routine use of sentinel-node-biopsy, no axillary dissection	4	D	++
■ Polychemotherapy (e.g. CHOP) in cases of extra capsular extension	4	D	+
■ Radiotherapy in unresectable tumors	5	D	+/-
■ Case discussion in an interdisciplinary tumor board in the presence of a specialist for lymphomas	5	D	++

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TNM Staging of BIA-ALCL				
	TNM-Kategorie	Definition	Stage	Definition
Tumor extent (cT/pT)	T1	Confined to seroma or a layer on luminal side of capsule	IA	T1 N0 M0
	T2	Early capsule infiltration	TB	T2 N0 M0
	T3	Cell aggregates or sheets infiltrating the capsule	TC	T3 N0 M0
	T4	Lymphoma infiltrates beyond the capsule	IIA	T4 N0 M0
Regional lymph nodes (cN/pN)	N0	No lymph node involvement	IIB	T1-3 N1 M0
	N1	One regional lymph node positive	III	T4 N1-2 M0
	N2	Multiple regional lymph nodes positive	IV	T any N any M1
Metastasis (cM/pM)	M0	No distant spread		
	M1	Spread to other organs or distant sites		

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BIA-ALCL – EUSOMA-Recommendation

- **Despite an increase of BIA-ALCL in association with texture implants the use of textured implants is still permitted!**

„For the moment, textured implants can safely continue to be used with patient's fully informed consent, and that women that have these type of implants already in place don't need to remove or substitute them, which would undoubtedly cause harm to many tens of thousands of women, to prevent an exceptionally rare, largely curable and currently poorly understood disease.“

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Tissue Replacement Techniques and Meshes (Details of Implant Reconstruction)			
	Oxford		
	LoE	GR	AGO
<div> <div>  <p>AGO e. V. in der DGGG e.V. sowie in der DKG e.V.</p> <p>Guidelines Breast Version 2022.1E</p> <p>In collaboration with:</p>  <p>www.ago-online.de</p> <p>FORSCHEN LEBEN HEILEN</p> </div> <div> <ul style="list-style-type: none"> ▪ The prepectoral lodge is superior to the subpectoral lodge ▪ Acellular dermal matrix (ADM) <ul style="list-style-type: none"> ▪ subpectoral ▪ prepectoral ▪ Synthetic meshes <ul style="list-style-type: none"> ▪ subpectoral ▪ prepectoral </div> </div>	3b	C	+/-
	1b	A	+/-*
	2b	B	+/-*
	2b	B	+/-*
	2b	B	+/-*


* Participation in registry studies recommended

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Lipotransfer

- **Lipotransfer following mastectomy and reconstruction**
- **Lipotransfer after BCS***
- **Autologous adipose derived stem cells (ASCs)-enriched fat grafting vs. without stem cells**

Oxford		
LoE	GR	AGO
2a	B	+
2a	B	+
2a	B	-

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	Oxford		
	LoE	GR	AGO
Breast reconstruction (BR) with autologous tissue			
▪ TRAM, latissimus-dorsi-flap (both can be performed as a muscle-sparing technique)	2a	C	+
▪ Delayed TRAM in patients at high-risk	3a	B	+
▪ Ipsilateral pedicled TRAM	2a	B	+
▪ Radiotherapy:			
▪ BR following radiotherapy	2a	B	+
▪ BR prior to radiotherapy	2a	B	+/-
▪ (higher rates of fibrosis, wound healing problems, liponecrosis and reduced aesthetic outcome)			

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Free Flaps for Reconstruction			
Type of free flap	Oxford		
	LoE	GR	AGO
▪ DIEP	2a	B	+
▪ Free TRAM	2a	B	+
▪ SIEA	3a	C	+/-
▪ Glutealis flaps (SGAP- / IGAP, FCI)	4	C	+/-
▪ Free gracilis flap (TMG)	4	C	+/-
▪ Use of ICG* to assess flap perfusion	2a	B	+
Advantages			
▪ DIEP and free TRAM are potentially muscle-sparing procedures. DIEP has a lower rate of abdominal hernias, especially in obesity			
Disadvantages			
▪ Time- and personnel consuming microsurgical procedures			
▪ Intensified postoperative monitoring			
▪ Pre-reconstruction radiotherapy increases rate of vascular complications			
* ICG: indocyanin green			

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Pedicled versus Free Tissue Transfer

Oxford
LoE GR AGO
3a A ++

- Muscle-sparing techniques and accuracy of abdominal wall closure lead to low rates of late donor site complications independent of method used**
- Autologous abdominal-based reconstructions have highest satisfaction rates (PROM)**
- Donor site morbidity (e.g. impaired muscle function) has to be taken into consideration with all flap techniques**

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Skin-/ Nipple-Sparing Mastectomy (SSM / NSM) and Reconstruction			
	Oxford		
	LoE	GR	AGO
■ Skin-/nipple-sparing Mastectomy (SSM / NSM)			
■ Safe (same recurrence rate as MX)	2b	B	++
■ Higher QoL for patients	2b	B	++
■ NAC can be preserved under special conditions	2b	B	++
■ Feasible after mastopexy / reduction mammoplasty	4	C	++
■ Use of ICG* to predict necrosis of the skin	1b	B	+
■ Skin incisions - different possibilities:			
■ Periareolar			
■ Hemi-periareolar with / without medial / lateral extension			
■ Reduction pattern: „inverted-T“ or vertical			
■ Inferior lateral approach, inframammary fold			
■ Lowest incidence of complications	2b	B	+

* ICG = Indocyanine Green

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Prevention and Therapy of Capsular Contracture			
	Oxford		
	LoE	GR	AGO
Prevention <ul style="list-style-type: none"> ▪ Textured implantats (Caveat: BIA-ALCL) ▪ Acellular Dermal Matrix (ADM) vs. nil ▪ Synthetic mesh vs. nil ▪ Topical antibiotics / antiseptics ▪ PVP (Povidone-Iodine) ▪ Leukotriene-antagonists ▪ Breast massage 			
	1a	A	+
	2a	B	+
	3a	C	+
	2a	B	+
	2a	B	+/-
	2a	B	+/-
	3a	C	-
Surgical interventions <ul style="list-style-type: none"> ▪ Capsulectomy ▪ Capsulotomy (Caveat: exclusion of BIA-ALCL) 			
	3b	C	+
	3b	C	+

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Topical antibiotic irrigation:

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Breast massage:

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Leukotriene antagonists:

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ADM:

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FORSCHEN
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HEILEN

Serome nach Implantatrekonstruktion I

- Inzidenz: ca. 5-10 % (2-50 %)

Einflussfaktoren:

- Z. n. Radiatio erhöht Risiko (RR ca. 3)
- Adipositas erhöht Risiko (z. B. BMI > 30 vs. < 30; RR ca. 3)
- Einsatz von ADM erhöht Risiko (RR ca. 3)
- Glatte Expander erhöhen Risiko (RR ca. 5)
- Z. n. neoadjuvanter Chemotherapie erhöht Risiko eher nicht
- Subcutane Loge erhöht Risiko eher nicht

Oxford	
LoE	GR
2a	B
2a	B
2a	B
2a	B
3b	C
2a	B
2b	B

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Seroma after Implant-Based Reconstruction II			
	Oxford		
	LoE	GR	AGO
Prevention			
▪ Drain with no, little and much suction	3b	C	+
▪ Drain removal at < 30ml per 24 hours	2b	B	+
Therapy			
▪ Evacuation of seroma by FNA or re-insertion of drain	4	C	+
▪ Dressings	5	D	+/-
▪ Revision surgery with capsulectomy (ultima ratio)	5	D	+
▪ Revision surgery with implant removal (ultima ratio)	5	D	+

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Risk-Reducing Bilateral Mastectomy for Healthy Women (RRBM)			
	Oxford		
	LoE	GR	AGO
▪ RRBM reduces breast cancer incidence	2b	B	++
▪ RRBM in deleterious BRCA1/2 mutation	2a	B	++
▪ RRBM in high-risk situation without BRCA 1/2 mutation (individual decision depending on personal- family history and mutational status – e.g. high and moderate-risk genes, Hodgkin lymphoma)	4	D	+/-*
▪ High risk and no BRCA counselling in specialized centre*	5	D	--
▪ Non-directive counselling prior to RR-BM	2b	B	+++
▪ RR-BM should be considered with other risk-reducing surgical options incl. bilateral salpingoophorectomy (BSO) and in the context of pre-existing diseases	2a	A	+++
▪ Further need for education of physicians regarding possibilities and advantages of RRBM	1b	A	++
* Counselling, risk prediction, and follow-up in specialized centers recommended			

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Surgical Prevention for <u>Healthy</u> Female <i>BRCA1/2</i> Mutation Carriers			
	Oxford		
	LoE	GR	AGO
■ Risk-reducing bilateral salpingo-oophorectomy (RR-BSO)** <ul style="list-style-type: none"> Reduces OvCa incidence and mortality Reduces overall mortality 	2a	B	++*
■ Risk-reducing bilateral mastectomy (RR-BM) <ul style="list-style-type: none"> Reduces BC incidence Reduces BC mortality in <i>BRCA1</i> mutation carriers*** 	2b	B	+*
	2b	B	+*

* Study participation recommended
 ** The RRSO is recommended from about 35 years for *BRCA1* and from about 40 years for *BRCA2* mutation carriers, considering the age of ovarian cancer diagnosis in the family and the family planning status.
 *** No reduction in mortality could be shown for *BRCA2* mutation carriers. RRM counselling should be individualised.

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Risk-reducing Interventions for BRCA1/2 Female Mutation Carriers <u>Affected</u> by Breast Cancer			
	Oxford		
	LoE	GR	AGO
Risk-reducing bilateral salpingo-oophorectomy (RR-BSO) <ul style="list-style-type: none"> Reduces OvCa incidence and mortality Reduces overall mortality (contradictory results for reduction of cl BC incidence) 	2b	B	++
Prophylactic contralateral mastectomy (RR-CM) reduces BC incidence and mortality	2b	B	++
Tamoxifen (reduces contralateral BC incidence)	2b	B	+/+
Indication for RR-CM should consider age at onset of first breast cancer in affected gene	2a	B	+++
RR-BM after ovarian cancer	4	C	+/+*

* Study participation recommended
 ** Depends on tumor stage (FIGO I/II), recurrence free interval (≥ 5 yrs.), age

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Forms of Risk-Reducing (Bilateral) Mastectomy (RR-BM)			
	Oxford		
	LoE	GR	AGO
RR-BM reduces breast cancer incidence;* BC-specific mortality also likely reduced			
▪ Simple mastectomy	2b	B	+
▪ RR-BM by SSM**	2b	C	+
▪ RR-BM by NSM** (NAC*** sparing)	2b	C	+
▪ Contralateral prophylactic mastectomy	4	C	+/-

* Depending on prior illnesses, e.g. pre-existing ovarian cancer 1-2% (stage III-IV)
 ** SSM / NSM: skin-/nipple-Sparing Mastectomy
 *** NAC: nipple-areola complex

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