Diagnostik und Therapie primärer und metastasierter Mammakarzinome

Guidelines Breast
Version 2018.1D

Lokoregionäres Rezidiv

FORSCHEN
LEHREN
HEILEN

Screened data bases

Pubmed 2005 - 2017, ASCO 2005 – 2017, SABCS 2009 – 2017, Cochrane data base

Guidelines

F. Cardoso ,A. Costa , E. Senkus et al; 3rd ESOeESMO international consensus guidelines for Advanced Breast Cancer (ABC 3) The Breast 31 (2017) 244e259

Cardoso F, Costa A, Norton L et al; ESO-ESMO 2nd international consensus guidelines for advanced breast cancer (ABC2). Breast. 2014 Oct;23(5):489-502.

Lin NU, Thomssen C, Cardoso F et al; European School of Oncology-Metastatic Breast Cancer Task Force. International guidelines for management of metastatic breast cancer (MBC) from the European School of Oncology (ESO)-MBC Task Force: Surveillance, staging, and evaluation of patients with early-stage and metastatic breast cancer. Breast. 2013 Jun;22(3):203-10.

NCCN (National Comprehensive Cancer Network, 2012); http://www.nccn.org/professionals/physician_gls/PDF/breast.pdf (download 13. Jan. 2013)

Interdisziplinäre S3-Leitlinie für die Diagnostik, Therapie und Nachsorge des Mammakarzinoms. Langversion 3.0, Aktualisierung 2012, AWMF-Register-Nummer: 032 – 045OL; http://www.dggg.de/fileadmin/public_docs/Leitlinien/S3-Brustkrebs-v2012-OL-Langversion.pdf

Harms W, Budach W, Dunst J et al; Breast Cancer Expert Panel of the German Society of

Radiation Oncology (DEGRO). DEGRO practical guidelines for radiotherapy of breast cancer VI: therapy of locoregional breast cancer recurrences. Strahlenther Onkol. 2016 Apr;192(4):199-208.

Lokoregionäres Rezidiv
Inzidenz und Prognose

Lokalisation	Häufigkeit (%)	5-Jahres-Überleben (%)
Ipsilateral Rezidiv[1] **(post BOT + Bestrahlung)**	**10 (2–20)**	**65 (45–79)**
Thoraxwand[1] **(nach Mastektomie)**	**4 (2–20)**	**50 (24–78)**
Supraclavicular Region[2]		
Axilla:	**34%**	**49% (3-y. OS)**
nach **ALND**[1]	**1 (0.1–8)**	**55 (31–77)**
nach **SNB**[4]	1	**93%**
Multiple Lokalisationen[2]	**16 (8–19)**	**21 (18–23)**

[1] Haffty et al. Int J Radiat Oncol Biol Phys 21(2):293-298, 1991;
[2] Reddy JP. Int J Radiat Oncol Biol Phys 80(5):1453-7, 201;
[3] Karabali-Dalamaga S et al. Br Med J 2(6139):730-733,1978;
[4] Andersson Y, et al. Br J Surg 99(2):226-31,2012

1. Haffty BG, Fischer D, Beinfield M et al; Prognosis following local recurrence in the conservatively treated breast cancer patient. Int J Radiat Oncol Biol Phys 21(2):293-298, 1991
2. Reddy JP, Levy L, Oh JL et al; Long-term outcomes in patients with isolated supraclavicular nodal recurrence after mastectomy and doxorubicin-based chemotherapy for breast cancer. Int J Radiat Oncol Biol Phys 80(5):1453-7, 2011
3. Karabali-Dalamaga S., Souhami R. L., O'Higgins N. J. et al; Natural history and prognosis of recurrent breast cancer. Br Med J 2(6139):730-733, 1978
4. Andersson Y, de Boniface J, Jönsson PE et al; Swedish Breast Cancer Group; Swedish Society of Breast Surgeons. Axillary recurrence rate 5 years after negative sentinel node biopsy for breast cancer. Br J Surg 99(2):226-31, 2012
5. Lowery AJ[1], Kell MR, Glynn RW et al; Locoregional recurrence after breast cancer surgery: a systematic review by receptor phenotype.Breast Cancer Res Treat. 2012 Jun;133(3):831-41. doi: 10.1007/s10549-011-1891-6. Epub 2011 Dec 7.
6. www.tumorregister-muenchen.de

Lokoregionäres Rezidiv
Staging

Untersuchung vor Behandlung	Oxford LoE	Oxford GR	AGO
▪ Histologische Sicherung	5	D	++
▪ Re-Evaluierung von ER, PgR, HER2	3b	B	++
▪ Komplettes Re-Staging	5	D	++

1. Veronesi U, Marubini E, Del Vecchio M et al; Local recurrences and distant metastases after conservative breast cancer treatments: partly independent events. J Natl Cancer Inst 87(1):19-27, 1995
2. Hölzel D, Engel L, Schmidt M et al; Modell zur primären und sekundären Metastasierung beim Mammakarzinom und dessen klinische Bedeutung. Strahlenther Onkol 177:10-24, 2001
3. Tennant S, Evans A, Macmillan D et al; CT staging of loco-regional breast cancer recurrence. A worthwhile practice? Clin Radiol. Sep;64(9):885-90, 2009
4. F. Cardoso ,A. Costa , E. Senkus et al; 3rd ESOeESMO international consensus guidelines for Advanced SBreast Cancer (ABC 3) The Breast 31 (2017) 244e259

Informative for the whole list of factors

1. Sestak I, Dowsett M, Ferree S et al; Retrospective analysis of molecular scores for the prediction of distant recurrence according to baseline risk factors. Breast Cancer Res Treat. 2016 Aug;159(1)

Statement: Increased risk for loco-regional recurrence

1. Early Breast Cancer Trialists' Collaborative Group (EBCTCG); Effects of radiotherapy and of differences in the extent of surgery for early breast cancer on local recurrence and 15-year survival: an overview of the randomised trials. Lancet 366: 2087–2106, 2005
2. Dalberg K, Mattsson A, Rutqvist LE et al; Breast conserving surgery for invasive breast cancer: risk factors for ipsilateral breast tumor recurrences. Breast Cancer Res Treat 43: 73–86, 1997
3. Wallgren A, Bonetti M, Gelber RD et al; Risk factors for locoregional recurrence among breast cancer patients: results from International Breast Cancer Study Group Trials I through VII. J Clin Oncol 21: 1205–1213, 2003
4. Fisher B, Anderson S, Bryant J et al; Twenty-year follow-up of a randomized trial comparing total mastectomy, lumpectomy, and lumpectomy plus irradiation for the treatment of invasive breast cancer. N Engl J Med 347: 1233–124, 2002
5. Truong PT et al; Lymphovascular invasion is associated with reduced locoregional control and survival in women with node-negative breast cancer treated with

mastectomy and systemic therapy. J Am Coll Surg. 200(6):912-21, 2005

6. Smith TE, Lee D, Turner BC et al; True recurrence vs. new primary ipsilateral breast tumor relapse: an analysis of clinical and pathologic differences and their implications in natural history, prognoses, and therapeutic management. Int J Radiat Oncol Biol Phys 48(5): 1281–1289, 2000
7. Lowery AJ, Kell MR, Glynn RW et al; Locoregional recurrence after Breast Cancer surgery: a systematic review by receptor phenotype. Breast Cancer Res Treat 133(3):831-41, 2012
8. Wapnir IL, Anderson SJ, Mamounas EP et al; Prognosis after ipsilateral breast tumor recurrence and locoregional recurrences in five National Surgical Adjuvant Breast and Bowel Project node-positive adjuvant breast cancer trials. J Clin Oncol 24: 2028-37, 2006
9. Hunt KK, Ballman KV, McCall LM et al; Factors associated with local-regional recurrence after a negative sentinel node dissection: results of the ACOSOG Z0010 trial. Ann Surg 256(3):428-36, 2012
10. Desai S, Hurley J et al; Impact of surgery-radiation interval on locoregional outcome in patients receiving neo-adjuvant therapy and mastectomy. Breast 19:427-30, 2013
11. Kindts I, Buelens P, Laenen A et al; Omitting radiation therapy in women with triple-negative breast cancer leads to worse breast cancer-specific survival. Breast. 2016 Dec 21;32:18-25.

Statement: Young age

1. van der Hage JA, Mieog JS, van de Velde CJ et al; Impact of established prognostic factors and molecular subtype in very young breast cancer patients: pooled analysis of four EORTC randomized controlled trials. Breast Cancer Res 24;13(3):R68, 2011
2. Algara López M, Sanz Latiesas X, Foro Arnalot P et al; Risk factors of local relapse in breast cancer: the importance of age. Clin Transl Oncol 9(2):110-6, 2007
3. de Bock GH, van der Hage JA, Putter H et al; Isolated loco-regional recurrence of breast cancer is more common in young patients and following breast conserving therapy: long-term results of European Organisation for Research and Treatment of Cancer studies. Eur J Cancer 42(3):351-6. 2006
4. Jobsen JJ, van der Palen J, Merrwaldt JH; The impact of age on local control in women with pT1 breast cancer treated with conservative surgery and radiation therapy. Eur J Cancer 37: 1820–1827, 2001
5. Vrieling C, Collette L, Fourquet A et al; EORTC Radiotherapy, Breast Cancer Groups. Can patient-, treatment- and pathology-related characteristics explain the high local recurrence rate following breast-conserving therapy in young patients? Eur J Cancer 39(7): 932–944, 2003
6. Elder EE, Kennedy CW, Gluch L et al; Patterns of breast cancer relapse. Eur J Surg Oncol. 32(9):922-7, 2006

7. Oh JL, Bonnen M, Outlaw ED et al; The impact of young age on locoregional recurrence after doxorubicin-based breast conservation therapy in patients 40 years old or younger: How young is "young"? Int J Radiat Oncol Biol Phys 65(5):1345-52, 2006
8. Karlsson P, Cole BF, Chua BH et al; Patterns and risk factors for locoregional failures after mastectomy for breast cancer: an International Breast Cancer Study Group report. Ann Oncol 23: 2852-8, 2012
9. Cronin PA, Olcese C, Patil S et al; Impact of Age on Risk of Recurrence of Ductal Carcinoma In Situ: Outcomes of 2996 Women Treated with Breast-Conserving Surgery Over 30 Years. Ann Surg Oncol. 2016 Sep;23(9):2816-24.

Statement: Positive microscopic margins

1. de Bock GH, van der Hage JA, Putter H et al; Isolated loco-regional recurrence of breast cancer is more common in young patients and following breast conserving therapy: long-term results of European Organisation for Research and Treatment of Cancer studies. Eur J Cancer 42(3):351-6, 2006
2. Early Breast Cancer Trialists' Collaborative Group (EBCTCG) Effects of radiotherapy and of differences in the extent of surgery for early breast cancer on local recurrence and 15-year survival: an overview of the randomised trials. Lancet 366: 2087–2106, 2005
3. Dalberg K, Mattsson A, Rutqvist LE et al; Breast conserving surgery for invasive breast cancer: risk factors for ipsilateral breast tumor recurrences. Breast Cancer Res Treat 43: 73–86, 1997
4. Wallgren A, Bonetti M, Gelber RD et al; Risk factors for locoregional recurrence among breast cancer patients: results from International Breast Cancer Study Group Trials I through VII. J Clin Oncol 21: 1205–1213, 2003
5. Pilewskie M, Ho A, Orell E et al; Effect of margin width on local recurrence in triple-negative breast cancer patients treated with breast-conserving therapy.. Ann Surg Oncol. 2014 Apr;21(4):1209-14.
6. Bosma SC, van der Leij F, van Werkhoven E et al; Very low local recurrence rates after breast-conserving therapy: analysis of 8485 patients treated over a 28-year period. Breast Cancer Res Treat. 2016 Apr;156(2)
7. Dixon JM, Thomas J, Kerr GR et al; A study of margin width and local recurrence in breast conserving therapy for invasive breast cancer. Eur J Surg Oncol. 2016 May;42(5):657-64

Statement: Extensive intraductal component

1. Early Breast Cancer Trialists' Collaborative Group (EBCTCG) Effects of radiotherapy and of differences in the extent of surgery for early breast cancer on local recurrence and 15-year survival: an overview of the randomised trials. Lancet 366: 2087–2106, 2005
2. Dalberg K, Mattsson A, Rutqvist LE et al; Breast conserving surgery for invasive

breast cancer: risk factors for ipsilateral breast tumor recurrences. Breast Cancer Res Treat 43: 73–86, 1997

3. Wallgren A, Bonetti M, Gelber RD et al; Risk factors for locoregional recurrence among breast cancer patients: results from International Breast Cancer Study Group Trials I through VII. J Clin Oncol 21: 1205–1213. 2003
4. Cheng SH et al; Prognostic index score and clinical prediction model of local regional recurrence after mastectomy in breast cancer patients. Int J Radiat Oncol Biol Phys 64(5):1401-9, 2006

Statement: Vessel invasion

1. Early Breast Cancer Trialists' Collaborative Group (EBCTCG) Effects of radiotherapy and of differences in the extent of surgery for early breast cancer on local recurrence and 15-year survival: an overview of the randomised trials. Lancet 366: 2087–2106, 2005
2. Dalberg K, Mattsson A, Rutqvist LE et al; Breast conserving surgery for invasive breast cancer: risk factors for ipsilateral breast tumor recurrences. Breast Cancer Res Treat 43: 73–86, 1997
3. Wallgren A, Bonetti M, Gelber RD et al; Risk factors for locoregional recurrence among breast cancer patients: results from International Breast Cancer Study Group Trials I through VII. J Clin Oncol 21: 1205–1213, 2003
4. Truong PT, Yong CM, Abnousi F et al; Lymphovascular invasion is associated with reduced locoregional control and survival in women with node-negative breast cancer treated with mastectomy and systemic therapy. J Am Coll Surg. 200(6):912-21, 2005

Statement: ER and PR negative/ basal like or triple negative tumors /Her 2 positive tumors

1. van der Hage JA, Mieog JS, van de Velde CJ et al; Impact of established prognostic factors and molecular subtype in very young breast cancer patients:pooled analysis of four EORTC randomized controlled trials. Breast Cancer Res Breast Cancer Res 24;13(3):R68, 2011
2. Cancello G, Maisonneuve P, Rotmensz N et al; Prognosis in women with small node-negative operable breast cancer by immunohistochemically selected subtypes, Breast Cancer Res Treat 127:713-20, 2011
3. Dalberg K, Mattsson A, Rutqvist LE et al; Breast conserving surgery for invasive breast cancer: risk factors for ipsilateral breast tumor recurrences. Breast Cancer Res Treat 43: 73–86, 1997
4. Wallgren A, Bonetti M, Gelber RD et al; Risk factors for locoregional recurrence among breast cancer patients: results from International Breast Cancer Study Group Trials I through VII. J Clin Oncol 21: 1205–1213, 2003
5. Cheng SH et al; Prognostic index score and clinical prediction model of local regional recurrence after mastectomy in breast cancer patients. Int J Radiat

Oncol Biol Phys. 2006 Apr 1;64(5):1401-9

6. Dominici LS, Mittendorf EA, Wang X et al; Implications of constructed biologic subtype and its relationship to locoregional recurrence following mastectomy. Breast Cancer Res 23;14(3):R82, 2012
7. Lowery AJ, Kell MR, Glynn RW et al; Locoregional recurrence after Breast Cancer surgery: a systematic review by receptor phenotype. Breast Cancer Res Treat 133(3):831-41, 2012
8. Wang J, Xie X et al; Locoregional and distant recurrences after breast conserving therapy in patients with triple negative breast cancer: A meta-analysis. Surg Oncol Epub ahead of print, 2013
9. Haixia Jia, Weijuan Jia, Yaping Yang et al; HER-2 positive breast cancer is associated with an increased risk of positive cavity margins after initial lumpectomy; World J Surg Oncol. 2014; 289.Published online 2014 Sep 20. doi: 10.1186/1477-7819-12-289PMCID: PMC4190445; 12: Asian Pac J Cancer Prev. 2014;15(1):315-20
10. Lai SF, Chen YH, Kuo WH et al; Locoregional Recurrence Risk for Postmastectomy Breast Cancer Patients With T1-2 and One to Three Positive Lymph Nodes Receiving Modern Systemic Treatment Without Radiotherapy. Ann Surg Oncol. 2016 Nov;23(12):3860-3869.
11. Braunstein LZ, Taghian AG, Niemierko A et al; Breast-cancer subtype, age, and lymph node status as predictors of local recurrence following breast-conserving therapy. Breast Cancer Res Treat. 2017 Jan;161(1):173-179.
12. Jwa E, Shin KH, Kim JY et al; Locoregional Recurrence by Tumor Biology in Breast Cancer Patients after Preoperative Chemotherapy and Breast Conservation Treatment. Cancer Res Treat. 2016 Oct;48(4):1363-1372. Epub 2016 Feb 18.

Statement: Grading G3

1. de Bock GH, van der Hage JA, Putter H et al; Isolated loco-regional recurrence of breast cancer is more common in young patients and following breast conserving therapy: long-term results of European Organisation for Research and Treatment of Cancer studies. Eur J Cancer 42(3):351-6, 2006
2. Cheng SH, Horng CF, Clarke JL et al; Prognostic index score and clinical prediction model of local regional recurrence after mastectomy in breast cancer patients. Int J Radiat Oncol Biol Phys 64(5):1401-9, 2006
3. Am J Clin Oncol. 2014 Oct;37(5):486-91. doi: 10.1097/COC.0b013e31827e54c2. Risk factors for locoregional recurrence after mastectomy in stage T1 N0 breast cancer.

Statement: pT > 2

1. Yildirim E, Berberoglu U; Local recurrence in breast carcinoma patients with T(1-2) and 1-3 positive nodes:indications for radiotherapy. Eur J Surg Oncol 33(1):28-32, 2007

2. Early Breast Cancer Trialists' Collaborative Group (EBCTCG) Effects of radiotherapy and of differences in the extent of surgery for early breast cancer on local recurrence and 15-year survival: an overview of the randomised trials Lancet 366: 2087–2106, 2005
3. Dalberg K, Mattsson A, Rutqvist LE et al; Breast conserving surgery for invasive breast cancer: risk factors for ipsilateral breast tumor recurrences. Breast Cancer Res Treat 43: 73–86, 1997
4. Wallgren A, Bonetti M, Gelber RD et al; Risk factors for locoregional recurrence among breast cancer patients: results from International Breast Cancer Study Group Trials I through VII. J Clin Oncol 21: 1205–1213, 2003
5. Cheng SH, Horng CF, Clarke JL et al; Prognostic index score and clinical prediction model of local regional recurrence after mastectomy in breast cancer patients. Int J Radiat Oncol Biol Phys 64(5):1401-9, 2006
6. Early Breast Cancer Trialists' Collaborative Group (EBCTCG); Effects of radiotherapy and of differences in the extent of surgery for early breast cancer on local recurrence and 15-year survival: an overview of the randomised trials. Lancet 366: 2087–2106, 2005
7. Dalberg K, Mattsson A, Rutqvist LE et al; Breast conserving surgery for invasive breast cancer: risk factors for ipsilateral breast tumor recurrences. Breast Cancer Res Treat 43: 73–86, 1997
8. Wallgren A, Bonetti M, Gelber RD et al; Risk factors for locoregional recurrence among breast cancer patients: results from International Breast Cancer Study Group Trials I through VII. J Clin Oncol 21: 1205–1213, 2003
9. Cheng SH, Horng CF, Clarke JL et al; Prognostic index score and clinical prediction model of local regional recurrence after mastectomy in breast cancer patients. Int J Radiat Oncol Biol Phys 64(5):1401-9, 2006
10. Buchanan CL, Dorn PL, Fey J et al; Locoregional recurrence after mastectomy: incidence and outcomes. J Am Coll Surg. 203: 469-74, 2006
11. Livi L, Paiar F, Simontacchi G et al; Loco regional failure pattern after lumpectomy and breast irradiation in 4,185 patients with T1 and T2 breast cancer. Implications for nodal irradiation. Acta Oncol. 45: 564-70, 2006
12. Breast Cancer. 2014 May;21(3):292-301. doi: 10.1007/s12282-012-0391-9. Epub 2012 Aug 14.
13. Nagao T, Kinoshita T, Tamura N et al; Locoregional recurrence risk factors and the impact of postmastectomy radiotherapy on patients with tumors 5 cm or larger.

<u>Statement: pN (N1 vs. N0)</u>

1. Early Breast Cancer Trialists' Collaborative Group (EBCTCG); Effects of radiotherapy and of differences in the extent of surgery for early breast cancer on local recurrence and 15-year survival: an overview of the randomised trials. Lancet 366: 2087–2106, 2005
2. www.tumorregister-muenchen.de

Statement: pN (N1 vs. N0) and number of involved lymph nodes

1. Yildirim E, Berberoglu U; Local recurrence in breast carcinoma patients with T(1-2) and 1-3 positive nodes:indications for radiotherapy. Eur J Surg Oncol 33(1):28-32, 2007
2. Early Breast Cancer Trialists' Collaborative Group (EBCTCG); Effects of radiotherapy and of differences in the extent of surgery for early breast cancer on local recurrence and 15-year survival: an overview of the randomised trials Lancet 366: 2087–2106, 2005
3. Dalberg K, Mattsson A, Rutqvist LE et al; Breast conserving surgery for invasive breast cancer: risk factors for ipsilateral breast tumor recurrences. Breast Cancer Res Treat 43: 73–86, 1997
4. Wallgren A, Bonetti M, Gelber RD et al; Risk factors for locoregional recurrence among breast cancer patients: results from International Breast Cancer Study Group Trials I through VII. J Clin Oncol 21: 1205–1213, 2003
5. Jagsi R, Raad RA, Goldberg S et al; Locoregional recurrence rates and prognostic factors for failure in node-negative patients treated with mastectomy: implications for postmastectomy radiation. Int J Radiat Oncol Biol Phys 62(4):1035-9, 2005
6. Cheng SH, Horng CF, Clarke JL et al; Prognostic index score and clinical prediction model of local regional recurrence after mastectomy in breast cancer patients. Int J Radiat Oncol Biol Phys 64(5):1401-9, 2006
7. Truong PT, Jones SO, Kader HA et al; Patients with t1 to t2 breast cancer with one to three positive nodes have higher local and regional recurrence risks compared with node-negative patients after breast-conserving surgery and whole-breast radiotherapy. Int J Radiat Oncol Biol Phys 73(2):357-64, 2009
8. Li Q, Wu S, Zhou J et al; Risk factors for locoregional recurrence after postmastectomy radiotherapy in breast cancer patients with four or more positive axillary lymph nodes. Curr Oncol. 2014 Oct;21(5):e685-90. doi: 10.3747/co.21.2000
9. Crawford JD, Ansteth M et al; Routine completion axillary lymph node dissection for positive sentinel nodes in patients undergoing mastectomy is not associated with improved local control. Am J Surg 205: 581-4, 2013

Statement: Medial tumor localisation

1. Knauerhase H, Strietzel M, Gerber B et al; Tumor location, interval between surgery and radiotherapy and boost technique influence local control after breast conserving surgery and radiation: retrospective analysis of monoinstitutional long-term results. Int J Radiat Oncol Biol Phys 72: 1048-55, 2008

Statement: elevate proliferation marker, esp. Ki67

1. Voduc KD, Cheang MC, Tyldesley S et al; Breast cancer subtypes and the risk of local and regional relapse. J Clin Oncol 28(10):1684-91, 2010

Statement: Inflammatory breast cancer

1. Saigal K, Hurley J et al; Risk factors for locoregional failure in patients with inflammatory breast cancer treated with trimodality therapy. Clin Breast Cancer 13:335-43, 2013

Statement: Nomograms

1. Tsoutsou PG, Jeanneret Sozzi W et al; Nomograms predicting locoregional recurrence in the subtype era of breast cancer. J Clin Oncol 31: 647-8, 2013
2. Manounas EP, Anderson SJ, Dignam JJ et al; Predictors of locoregional recurrence after neoadjuvant chemotherapy: results from combined analysis of NASBP B-18 and B-27. J Clin Oncol 30: 3960-6, 2012
3. Kraeima J, Siesling S, Vliegen IM et al;Individual risk profiling for breast cancer recurrence: towards tailored follow-up schemes. Br J Cancer 109: 866-71, 2013

Statement: Obesity

1. D. S. M. Chan et al; Body mass index and survival in women with breast cancer—systematic literature review and meta-analysis of 82 follow-up studies Ann Oncol. Oct 2014; 25(10): 1901–1914. Published online Apr 27, 2014.
2. Xia X, Chen W, Li J et al; Body mass index and risk of breast cancer: a nonlinear dose-response meta-analysis of prospective studies. Sci Rep. 2014 Dec 15;4:7480.
3. Bergom C ,Kelly T, Bedi M et al; Association of Locoregional Control With High Body Mass Index in Women Undergoing Breast Conservation Therapy for Early-Stage Breast Cancer. Int J Radiat Oncol Biol Phys. 2016 Sep 1;96(1):65-71
4. Warren LE, Ligibel JA, Chen YH et al; Body Mass Index and Locoregional Recurrence in Women with Early-Stage Breast Cancer. Ann Surg Oncol. 2016 Nov;23(12):3870-3879.

Recent evidence for Multigene arrays predicting risk for local relapse

1. Drukker CA, Elias SG, Nijenhuis MV et al; Gene expression profiling to predict the risk of locoregional recurrence in breast cancer: a pooled analysis. Breast Cancer Res Treat. 2014 Dec;148(3):599-613.
2. Drukker CA, Elias SG, Nijenhuis MV et al; Erratum to: Gene expression profiling to predict the risk of locoregional recurrence in breast cancer: a pooled analysis. Breast Cancer Res Treat. 2015 Jan 21.
3. Fitzal F, Filipits M, Fesl C et al; Predicting local recurrence using PAM50 in postmenopausal endocrine responsive breast cancer patients. J Clin Oncol 32:5s,

2014 (suppl; abstr 1008)

Metaanalyse: TNBC und lokoregionales Rezidiv

Wang et al, Surg Oncol. 2013 Dec;22(4):247-55.

n = 15312 BC-patients, 22 studies, Hazard-ratios

BCT	**vs.**	**ME**
ILRR	**0.75 (0.65-0.87)**	
DM	**0.68 (0.60-0.76)**	

TNBC-subtype	**vs.**	**other subtype**
ILRR	**1.88 (1.58-2.22)**	
DM	**2.12 (1.72-2.62)**	

TNBC-subtype	**vs.**	**HER2-subtype**
ILRR	**0.69 (0.53-0.91)**	
DM	**n.s.**	

ILRR: ipsilateral locoregional recurrence
DM: distant metastasis
TNBC: triple negative breast cancer
BCT: breast conserving therapy
ME: mastectomy

Risikofaktoren für lokoregionales Rezidiv nach Mastektomie

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Karlsson et al. Ann Oncol 23:2852-8, 2012

IBCSG-Studie, 13 randomisierte Studien n = 8106 Patienten

Risikofaktoren für 10 J. kumulative Inzidenz …:

… > 15% Thoraxwand	**Alter < 40; ≥ 4 pos. Lymphknoten, 0-7 befallene LK**
… > 10% supraclaviculär:	**≥ 4 pos. LK**
… > 5% axillares Rezidiv:	**Alter < 40; Tumorgröße unbekannt, 0-7 nicht befallene Lymphknoten**

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Metaanalyse:
7174 BET und 5418 ME

Lowery AJ, et al. Breast Cancer Res Treat 133(3):831-41, 2012

After BCT:

HR-positive tumors show a lower risk for LRR than...

triple negative tumors (RR 0.38) and....

HER2-expressing tumors (RR 0.34)*

After ME:

HR-positive tumors show a lower risk for LRR than...

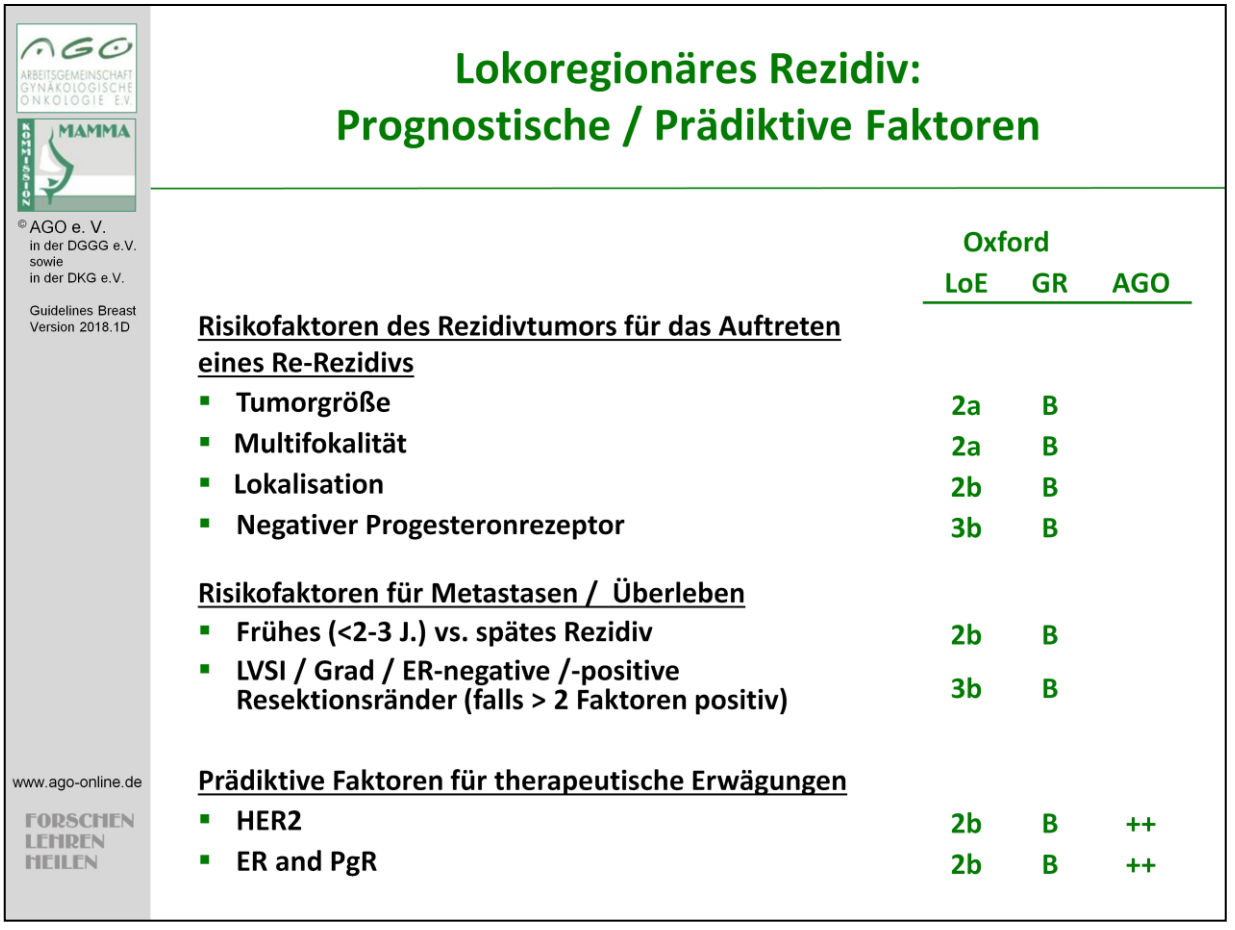
HER2-expressing tumors (RR 0.69)* and...

triple negative tumors (RR 0.61)

Result:

HR-positive tumors exhibit the lowest rate of local recurrence.

*** most pts. were treated in the time before routine adjuvant trastuzumab use**



Parameters in local recurrence to define risk for re-recurrence

Statement: Tumour size

1. Wapnir IL, Anderson SJ, Mamounas EP et al; Prognosis after ipsilateral breast tumor recurrence and locoregional recurrences in five National Surgical Adjuvant Breast and Bowel Project node-positive adjuvant breast cancer trials. J Clin Oncol 24: 2028-37, 2006
2. Lannin DR, Haffty BG; End results of salvage therapy after failure of breast-conservation surgery. Oncology (Huntingt) 18(3):272-9, 2004 discussion 280-2, 285-6, 292.

Statement: Multifocality

1. Wapnir IL, Anderson SJ, Mamounas EP et al; Prognosis after ipsilateral breast tumor recurrence and locoregional recurrences in five National Surgical Adjuvant Breast and Bowel Project node-positive adjuvant breast cancer trials. J Clin Oncol 24: 2028-37, 2006

Statement: Localisation

1. Cheng SH, Horng CF, Clarke JL et al; Prognostic index score and clinical prediction model of local regional recurrence after mastectomy in breast cancer patients. Int J Radiat Oncol Biol Phys 64(5):1401-9, 2006

2. Lannin DR, Haffty BG; End results of salvage therapy after failure of breast-conservation surgery. Oncology (Huntingt) 18(3):272-9, 2004 discussion 280-2, 285-6, 292.

Statement: ER-pos/PgR-pos vs ER-pos/PgR-neg or ER-neg/PgR-neg

1. Wapnir IL, Gelber S, Anderson SJ et al; CALOR trial investigators. Poor Prognosis After Second Locoregional Recurrences in the CALOR Trial. Ann Surg Oncol. 2017 Feb;24(2):398-406

Statement: Early vs. Late recurrence

1. Lee JS, Kim SI, Park HS et al; The impact of local and regional recurrence on distant metastasis and survival in patients treated with BCT. J Breast Cancer 14:191-7, 2011
2. Halverson KJ, Perez CA, Kuske RR et al; Survival following locoregional recurrence of breast cancer: univariate and multivariate analysis. Int J Radiat Oncol Biol Phys 23(2):285-91, 1992
3. Wapnir IL, Anderson SJ, Mamounas EP et al; Prognosis after ipsilateral breast tumor recurrence and locoregional recurrences in five National Surgical Adjuvant Breast and Bowel Project node-positive adjuvant breast cancer trials. J Clin Oncol 4(13):2028, 2006

LVSI/Grade/ERneg/close margins

Change from close margin to positive margin

1. Panet-Raymond V, Truong PT, Alexander C et al; Clinicopathological factors of the recurrent tumor to predict outcome in patients with ipsilateral breast tumor recurrence. Cancer 117:2035, 2011

Margin width and Re-excision in breast conservativ treatment. a Denish breast coopertive group of 11.900 women.

1. A. Bodilson et al; St Antonio Breast cancer symposium Dez.2015. Increased risk of IBTR associated with final positive margin.

Predictive factors for treatment considerations

Statement: HER-2

1. Clemons M, Hamilton T, Goss P; Does treatment at the time of locoregional failure of breast cancer alter prognosis? Cancer Treat Rev 27(2): 83–97, 2001

Statement: ER and PR

1. Clemons M, Hamilton T, Goss P; Does treatment at the time of locoregional

failure of breast cancer alter prognosis? Cancer Treat Rev 27(2): 83–97, 2001

2. Haffty BG, Reiss M, Beinfield M et al; Ipsilateral breast tumor recurrence as a predictor of distant disease: implications for systemic therapy at the time of local relapse. J Clin Oncol 14: 52–57, 1996
3. Kuo SH, Huang CS, Kuo WH et al; Comprehensive locoregional treatment and systemic therapy for postmastectomy isolated locoregional recurrence. Int J Oncology Biol Phys 72: 1456-64, 2008

Clinicopathological Factors of the Recurrent Tumor to Predict Outcome in Patients with Ipsilateral Breast Tumor Recurrence

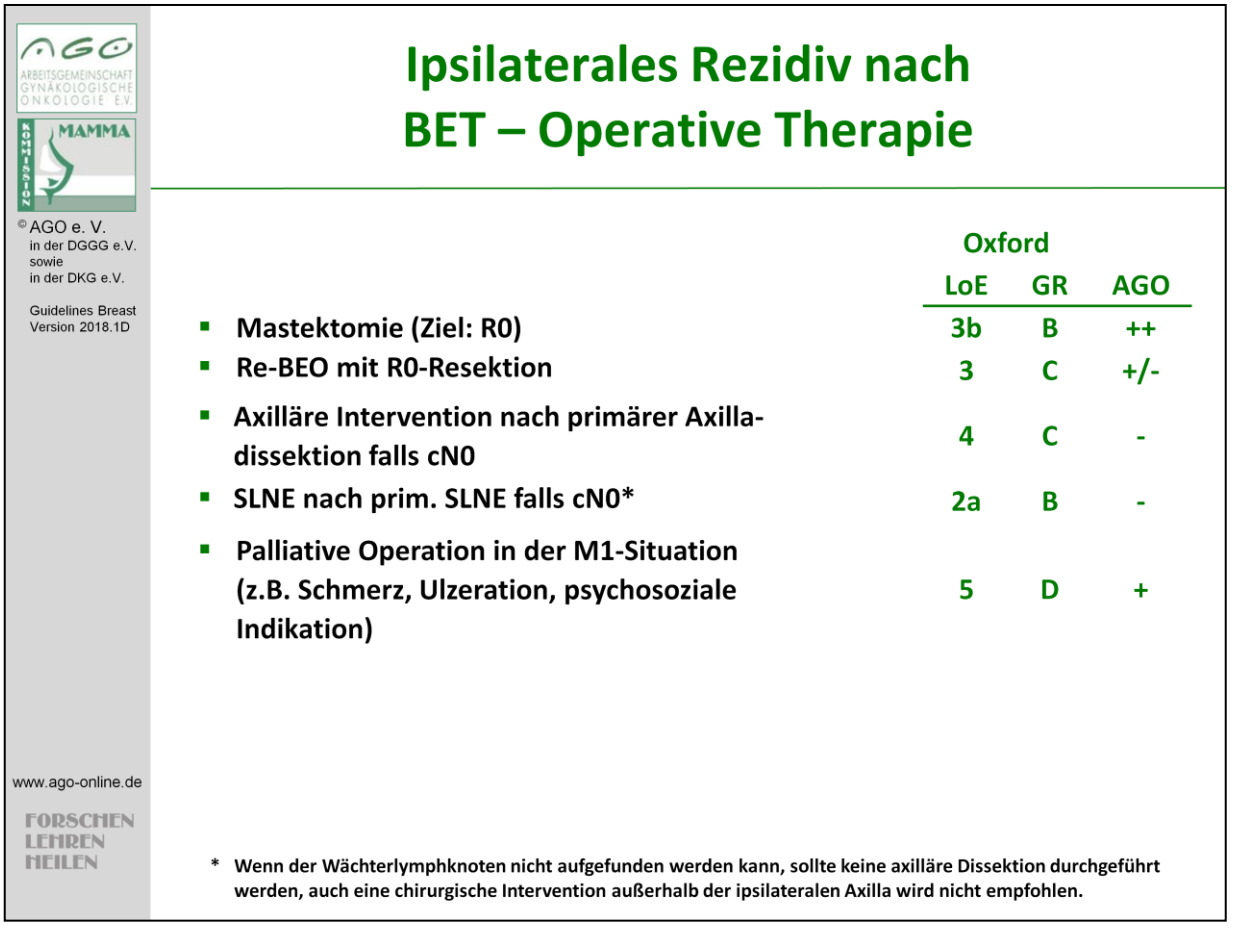
Guidelines Breast
Version 2018.1D

Panet-Raymond V et al. Cancer 117:2035, 2011

n = 6020 pts., retrospective cohort-study
pT1/2, N0 tumors, breast conserving treatment
269 ipsilateral breast tumor recurrences (IBTR)

<u>Multivariate analysis:</u>
TTR < 48 months
LVSI (of the LRR)
ER negative LR-tumor
high grade
close margins of recurrent tumor

→ if ≥ 2 factors positive ⇒ worse OS



Statement: Mastectomy (aim: R0)

1. Alpert TE, Kuerer HM, Arthur DW et al; Ipsilateral breast tumor recurrence after breast conservation therapy: outcomesof salvage mastectomy vs. salvage breast-conserving surgery and prognosticfactors for salvage breast preservation. Int J Radiat Oncol Biol Phys 63(3):845-51, 2005
2. Shin E, Suemasu K, Sonoo H et al; Analysis of ipsilateral breast tumor recurrences after breast-conservingtreatment based on the classification of true recurrences and new primary tumors. Breast Cancer 12(2):104-11, 2005
3. Kolben T, Schwarz TM, Goess C et al; Surgical management of ipsilateral breast tumor recurrence. Int J Surg. 2015 Nov;23(Pt A):141-6.
4. NCCN clinical practice Guidelines in oncology(NCCN guidelines) breast cancer Version 3.2015 NCCN.org

Statement: Axillary intervention (SNE/AxDiss) after prior SNE and BCS if cN0

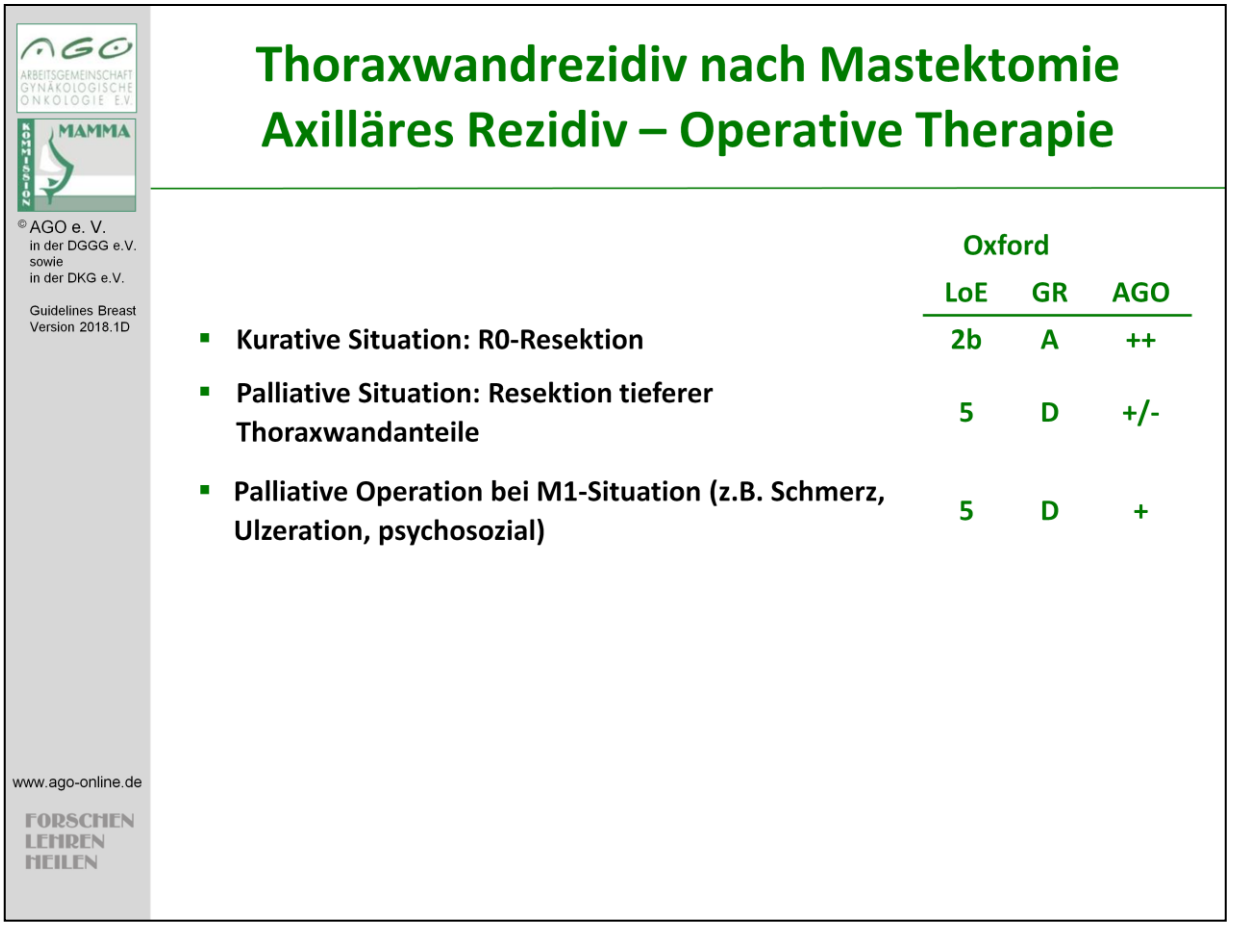
1. Intra M, TrifiròG, Viale G et al; Second biopsy of axillary sentinel lymph node for reappearing breast cancer after previous sentinel lymph node biopsy. Ann Surg Oncol 12(11):895- 899, 2005
2. Taback B, Nguyen P, Hansen N et al; Sentinel lymph node biopsy for local recurrence of breast cancer after breast-conserving therapy. Ann Surg Oncol 13(8):1099-104, 2006
3. Port ER, Garcia-Etienne CA, Park J et al; Reoperative sentinel lymph node biopsy: a new frontier in the management of ipsilateral breast tumor recurrence. Ann Surg

Oncol. 14(8):2209-14, 2007

4. Derkx F, Maaskant-Braat AJ, van der Sangen MJ et al; Staging and management of axillary lymph nodes in patients with local recurrence in the breast or chest wall after a previous negative sentinel node procedure. Eur J Surg Oncol 36(7):646-51, 2010
5. Barone JL, Feldman SM, Estabrook A et al; Reoperative sentinel lymph node biopsy in patients with locally recurrent breast cancer. Am J Surg 194(4):491-3,2007
6. Maaskant-Braat AJ, Voogd AC, Roumen RM et al; Repeat sentinel node biopsy in patients with locally recurrent breast cancer: a systematic review and meta-analysis of the literature. Breast Cancer Res Treat. 2013 Feb;138(1):13-20. doi: 10.1007/s10549-013-2409-1. Epub 2013 Jan 23
7. Kothari MS, Rusby JE, Agusti AA et al; Sentinel lymph node biopsy after previous axillary surgery: A review. Eur J Surg Oncol. 2012 Jan;38(1):8-15. doi: 10.1016/j.ejso.2011.10.003. Epub 2011 Oct 26.
8. Uth CC, Christensen MH, Oldenbourg MH et al; Sentinel Lymph Node Dissection in Locally Recurrent Breast Cancer. Ann Surg Oncol. 2015 Jan 7. [Epub ahead of print]
9. Ugras S, Matsen C, Eaton A et al; Reoperative sentinel lymph node biopsy is feasible for locally recurrent breast cancer, but is it worthwhile? Ann Surg Oncol. 2016 March ; 23(3): 744–748. doi:10.1245/s10434-015-5003-4.

<u>Statement: Palliative surgery in M1-situation</u>

1. Rapiti E. et al; Complete Excision of Primary Breast Tumor Improves Survival of Patients With Metastatic Breast Cancer at Diagnosis. Journal of Clinical Oncology 2743-2749, 2006



Statement: Curative situation: R0-resection

1. Mignano JE, Gage I, Piantadosi S et al; Local recurrence after mastectomy in patients with T3pN0 breast carcinoma treatedwithout postoperative radiation therapy. Am J Clin Oncol 30(5)466-72, 2007

Statement: Palliative situation: Resection of deep parts of the chest wall

1. Mignano JE, Gage I, Piantadosi S et al; Local recurrence after mastectomy in patients with T3pN0 breast carcinoma treatedwithout postoperative radiation therapy. Am J Clin Oncol 30(5):466-72, 2007
2. Pfannschmidt J, Geisbüsch P, Muley T et al; Surgical resection of secondary chest wall tumors. Thorac Cardiovasc Surg 53(4):234-9, 2005

Statement: Palliative surgery in M1-situation (e.g. pain, ulceration, psychosocial)

1. Rapiti E. et al; Complete Excision of Primary Breast Tumor Improves Survival of Patients With Metastatic Breast Cancer at Diagnosis. Journal of Clinical Oncology 2743-2749, 2006

Lokoregionäres Rezidiv und R0-Resektion – Systemische Therapie

Guidelines Breast
Version 2018.1D

	Oxford		
	LoE	GR	AGO
Nach patho-histologischer Re-Evaluation des Rezidivtumors (ER, PgR, HER2)			
▪ **Endokrine Therapie bei hormonrezeptorpositiven Tumoren**	2b	B	++
▪ **Chemotherapie (ggfs. präoperativ)**	2b	B	+
▪ **Bei HER2-überexprimierenden Tumoren Chemotherapie und HER2-zielgerichtete Therapie**	5	D	+

Statement: Endocrine therapy in endocrine responsive disease

1. Borner M, Bacchi M, Goldhirsch A et al; First isolated locoregional recurrence following mastectomy for breast cancer: results of a phase III multicenter study comparing systemic treatment with observation after excision and radiation. Swiss Group for Clinical Cancer Research.J Clin Oncol. 12(10):207, 1994
2. Lê MG, Arriagada R, Spielmann M et al; Prognostic factors for death after an isolated local recurrence in patients with early-stage breast carcinoma. Cancer 94(11):2813-20, 2002
3. Halverson KJ, Perez CA, Kuske RR et al; Locoregional recurrence of breast cancer: a retrospective comparison of irradiation alone versus irradiation and systemic therapy. Am J Clin Oncol. 15(2):93-101, 1992

Statement: Chemotherapy

1. Easson AM, McCready DR; Management of local recurrence of breast cancer. Expert Rev Anticancer Ther 4(2):219-26, 2004
2. Rauschecker H, Clarke M, Gatzemeier et al; Systemic therapy for treating locoregional recurrence in women with breast cancer. Cochrane Database Syst Rev. 2001;(4):CD002195. Review.
3. Kuo SH, Huang CS, Kuo WH et al; Comprehensive locoregional treatment and systemic therapy for postmastectomy isolated locoregional recurrence. Int J Radiation Oncology Biol Phys 72: 1456-64, 2008.

4. Aebi S, Gelber S, Anderson SJ et al; CALOR investigators.Chemotherapy for isolated locoregional recurrence of breast cancer (CALOR): a randomised trial.Lancet Oncol. 2014 Feb;15(2):156-63.

Statement: Trastuzumab - based therapy in HER-2 overexpressing tumors

1. So far, extrapolations from adjuvant HER2-directed studies and from studies in metastatic breast cancer
   Cardoso F, Harbeck N, Fallowfield L et al; ESMO Guidelines Working Group. Locally recurrent or metastatic breast cancer: ESMO Clinical Practice Guidelines for diagnosis, treatment and follow-up. Ann Oncol 22:suppl 7:vii11-9, 2012
2. Interdisziplinäre S3-Leitlinie für die Diagnostik, Therapie und Nachsorge des Mammakarzinoms
   Langversion 3.0, Aktualisierung 2012, AWMF-Register-Nummer: 032 – 045OL; http://www.dggg.de/fileadmin/public_docs/Leitlinien/S3-Brustkrebs-v2012-OL-Langversion.pdf

Chemotherapie bei lokoregionärem Rezidiv

Guidelines Breast
Version 2018.1D

- **CALOR Trial update**

n = 163 (2003-2010), median follow-up of 4.9 years, all R0 resection

5-year disease-free survival: 69% (95% CI 56-79) with chemotherapy vs. 57% (44-67) without chemotherapy (hazard ratio 0.59 [95% CI 0.35-0.99]; p=0.046): 24 (28%) patients vs. 34 (44%).

Adjuvant chemotherapy was significantly more effective in ER negative disease ($p_{interaction}$=0.046).

Wapnir IL et al. Annals of Surgical Oncology, February 2017, Volume 24, Issue 2, pp 398–406| Cite as

Chemotherapie bei lokoregionärem Rezidiv

- **CALOR Trial update**

	ER-positive			ER-negative		
Endpoint	**CT**	**No-CT**	**HR (95%CI)**	**CT**	**No-CT**	**HR (95%CI)**
10-yr DFS	**50%**	**59%**	**1.07 (0.57 – 2.00)**	**70%**	**34%**	**0.29 (0.13 – 0.67)**
	Interaction P-Value =0.013					
10-yr OS	**76%**	**66%**	**0.70 (0.32 – 1.55)**	**73%**	**53%**	**0.48 (0.19 – 1.20)**
	Interaction P-value =0.53					
10-yr BCFI	**58%**	**62%**	**0.94 (0.47 – 1.85)**	**70%**	**34%**	**0.29 (0.13 – 0.67)**
	Interaction P-value = 0.034					

Wapnir IL et al. Annals of Surgical Oncology, February 2017, Volume 24, Issue 2, pp 398–406| Cite as

Lokoregionäres Rezidiv (R1-Resektion/Inoperabilität) – Systemische Therapie

	Oxford		
	LoE	GR	AGO
Nach patho-histologischer Re-Evaluation des Rezidivtumors (ER, PgR, HER2)			
▪ **Endokrine Therapie bei hormonrezeptorpositiven Tumoren**	2b	B	++
▪ **Chemotherapie (prä- oder postoperativ)**	2b	B	+
▪ **Bei HER2-positiven Tumoren: HER2-zielgerichtete Therapie mit Chemotherapie**	5	D	++

Statement: Endocrine therapy in endocrine responsive disease

1. Borner M, Bacchi M, Goldhirsch A et al; First isolated locoregional recurrence following mastectomy for breast cancer: results of a phase III multicenter study comparing systemic treatment with observation after excision and radiation. Swiss Group for Clinical Cancer Research.J Clin Oncol. 12(10):207, 1994
2. Lê MG, Arriagada R, Spielmann M et al; Prognostic factors for death after an isolated local recurrence in patients with early-stage breast carcinoma. Cancer 94(11):2813-20, 2002
3. Halverson KJ, Perez CA, Kuske RR et al; Locoregional recurrence of breast cancer: a retrospective comparison of irradiation alone versus irradiation and systemic therapy. Am J Clin Oncol. 15(2):93-101, 1992

Statement: Chemotherapy (pre- or postoperatively)

1. Kuo SH et al; Comprehensive locoregional treatment and systemic therapy for postmastectomy isolated locoregional recurrence. Int J Radiat Oncol Biol Phys 72: 1456-64 (2008)
2. Tokunaga Y, Hosogi H, Nakagami M et al; A case of chest wall recurrence of breast cancer treated with paclitaxel weekly, 5'-deoxy-5-fluorouridine, arterial embolization and chest wall resection. Breast Cancer. 2003;10(4):366-70.
3. Easson AM, McCready DR; Management of local recurrence of breast cancer. Expert Rev Anticancer Ther 4(2):219-26, 2004

4. Rauschecker H, Clarke M, Gatzemeier W et al; Systemic therapy for treating locoregional recurrence in women with breast cancer. Cochrane Database Syst Rev. 2001;(4)
5. Kuo SH, Huang CS, Kuo WH et al; Comprehensive locoregional treatment and systemic therapy for postmastectomy isolated locoregional recurrence. Int J Radiation Oncology Biol Phys 72: 1456-64, 2008
6. http://www.nccn.org/professionals/physician_gls/pdf/breast.pdf. Chapter Systemic treatment of recurrent or stage IV-breast cancer. BINV-17Version 3.2012
7. F. Cardoso ,A. Costa , E. Senkus et al; 3rd ESOeESMO international consensus guidelines for Advanced Breast Cancer (ABC 3) The Breast 31 (2017) 244e259

Statement: Trastuzumab based therapy in HER-2 overexpressing tumors

Ipsilaterales Rezidiv nach primärer BET – Strahlentherapie

	Oxford LoE	Oxford GR	Oxford AGO
Nach Re-BEO			
▪ Ganzbrustbestrahlung (falls keine adjuvante RT erfolgt war)	3b	C	++
▪ Erneute Bestrahlung (Mamma) (z.B. Brachytherapie, externe Beam RT)	3b	C	+/-
Nach Mastektomie			
▪ Thoraxwandbestrahlung +/- regionäre Lymphknoten (14% befallene supraklavikuläre LK)	2b	B	+/-
▪ Dosiseskalation der Bestrahlung	3b	C	-
▪ Erneute Bestrahlung (ggf. als Brachytherapie) mit Hyperthermie	3a	C	+/-

Statement: Whole breast radiation

1. McCready DR, Fish EB, Hiraki GY et al; Total mastectomy is not always mandatory for the treatment of recurrent breast cancer after lumpectomy alone. Can J Surg 35(5):485 :485-8, 1992
2. Interdisziplinäre S3-Leitlinie für die Diagnostik, Therapie und Nachsorge des Mammakarzinoms Langversion 3.0, Aktualisierung 2012, AWMF-Register-Nummer: 032 – 045OL; http://www.dggg.de/fileadmin/public_docs/Leitlinien/S3-Brustkrebs-v2012-OL-Langversion.pdf
3. Cardoso F, Harbeck N, Fallowfield L et al; ESMO Guidelines Working Group. Locally recurrent or metastatic breast cancer: ESMO Clinical Practice Guidelines for diagnosis, treatment and follow-up. Ann Oncol 22:suppl 7:vii11-9, 2012
4. Skinner HD, Strom EA Motwani SB et al; Radiation dose escalation for locoregional recurrence of breast cancer after mastectomy. Radiat Oncol 8: 13, 2013

Statement: Re-irradiation (breast)

1. Hannoun-Levi JM et al; Partial breast irradiation as second conservative treatment for local breast cancer recurrence. Int J Radiat Oncol Biol Phys 60(5):1385-92, 2004
2. Kuerer HM; Repeat breast-conserving surgery for in-breast local breast carcinoma recurrence: the potential role of partial breast irradiation. Cancer 100(11):2269-80, 2004
3. Alpert TE, Kuerer HM, Arthur DW et al; Ipsilateral breast tumor recurrence after breast

conservation therapy: outcomesof salvage mastectomy vs. salvage breast-conserving surgery and prognosticfactors for salvage breast preservation. Int J Radiat Oncol Biol Phys 63(3):845-51, 2005

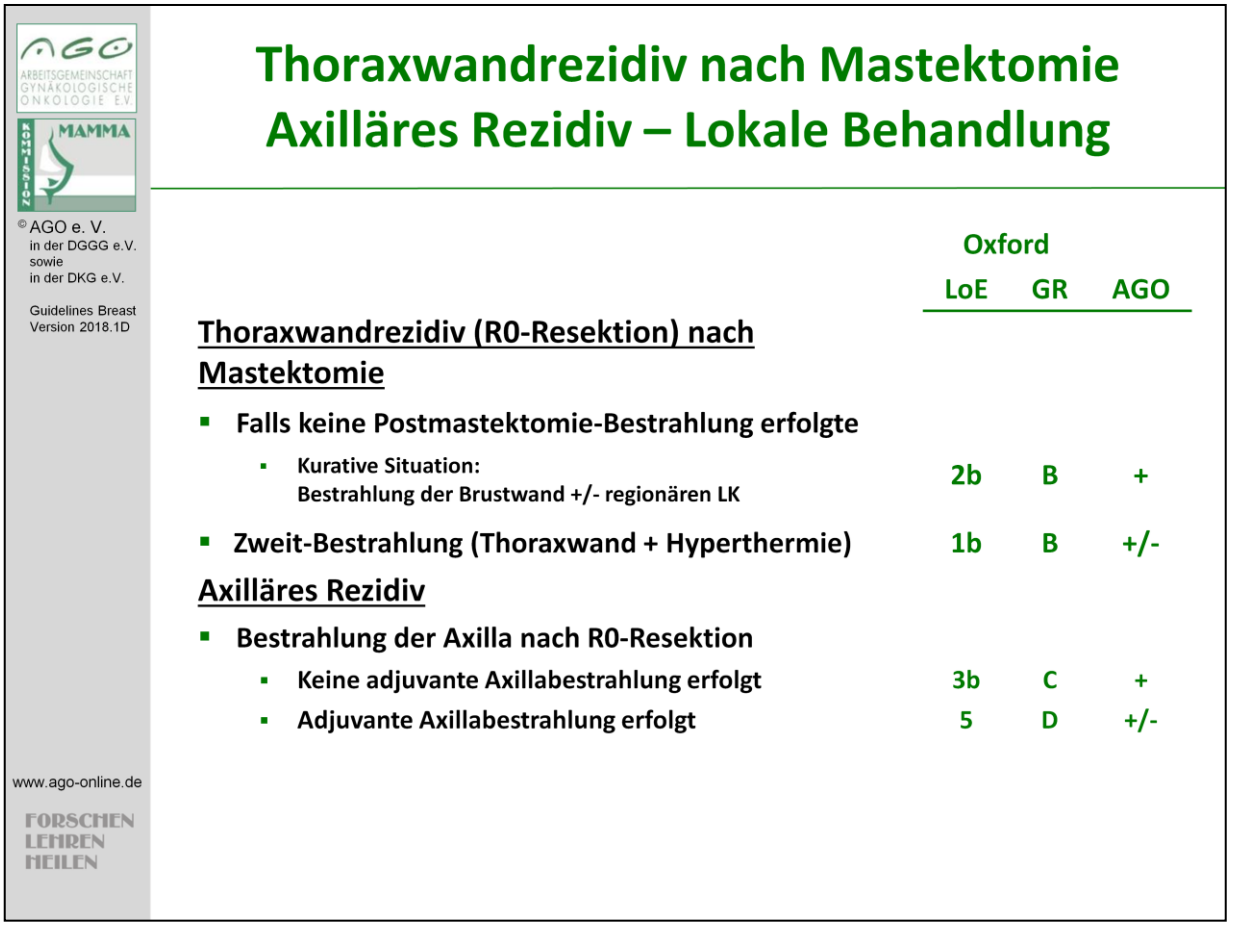
4. Cardoso F, Harbeck N, Fallowfield L et al; ESMO Guidelines Working Group. Locally recurrent or metastatic breast cancer: ESMO Clinical Practice Guidelines for diagnosis, treatment and follow-up. Ann Oncol 22:suppl 7:vii11-9, 2012
5. Skinner HD, Strom EA, Motwani SB et al; Radiation dose escalation for locoregional recurrence of breast cancer after mastectomy. Radiat Oncol 8: 13, 2013
6. Linthorst M, van Geel AN, Baaijens M et al; Re-irradiation and hyperthermia after pulsed dose rate (PDR) brachytherapy moulds for breast cancer local recurrences. Int J Radiat
7. Surgery for recurrent breast cancer . Radiother Oncol 2013;109:188-93
8. Linthorst M, van Geel AN, Baartman EA et al; Effect of a combined surgery, re-irradiation and hyperthermia therapy on local control rate in radio-induced angiosarcoma of the chest wall. Strahlenther Onkol 2013;189:387-393

Statement: Curative situation: irradiation of the chest wall +/- regional lymph nodes

1. Wahl AO, Rademaker A, Kiel KD et al; Multi-Institutional Review of Repeat Irradiation of Chest Wall and Breast for Recurrent Breast Cancer. Int J Radiat Oncol Biol Phys. 2007 Sep 13

Statement Re-Irradiation of the chest wall with hyperthermia

1. Auoragh A, Strnad V, Ott OJ et al; Re-irradiation of the chest wall for local breast cancer recurrence : Results of salvage brachytherapy with hyperthermia. Strahlenther Onkol. 2016 Sep;192(9):617-23.
2. Datta NR, Puric E, Klingbiel D et al; Hyperthermia and Radiation Therapy in Locoregional Recurrent Breast Cancers: A Systematic Review and Meta-analysis. Int J Radiat Oncol Biol Phys. 2016 Apr 1;94(5):1073-87.
3. Oldenborg S, Valk C, van Os R et al; Rib fractures after reirradiation plus hyperthermia for recurrent breast cancer: Predictive factors. Strahlenther Onkol. 2016 Apr;192(4):240-7.



Statement: If no prior postmastectomy radiotherapy

1. Wahl AO, Rademaker A, Kiel KD et al; Multi-Institutional Review of Repeat Irradiation of Chest Wall and Breast for Recurrent Breast Cancer. Int J Radiat Oncol Biol Phys 70(2):477-84, 2008

Statement: Re-irradiation (chest wall + hyperthermia)

1. Zagar TM, Oleson JR, Vujaskovic Z et al; Hyperthermia combined with radiation therapy for superficial breast cancer and chest wall recurrence: a review of the randomised data. Int J Hyperthermia 26(7):612-7, 2010
2. Auoragh A, Strnad V, Ott OJ et al; Re-irradiation of the chest wall for local breast cancer recurrence : Results of salvage brachytherapy with hyperthermia. Strahlenther Onkol. 2016 Sep;192(9):617-23.
3. Datta NR, Puric E, Klingbiel D et al; Hyperthermia and Radiation Therapy in Locoregional Recurrent Breast Cancers: A Systematic Review and Meta-analysis. Int J Radiat Oncol Biol Phys. 2016 Apr 1;94(5):1073-87.
4. Oldenborg S, Valk C, van Os R et al; Rib fractures after reirradiation plus hyperthermia for recurrent breast cancer: Predictive factors. Strahlenther Onkol. 2016 Apr;192(4):240-7.

Statement Axillary recurrence

1. http://www.nccn.org/professionals/physician_gls/pdf/breast.pdf. Chapter Systemic

treatment of recurrent or stage IV-breast cancer. BINV-17;Version 3.2012

2. Konkin DE, Tyldesley S, Kennecke H et al; Arch Surg. Management and outcomes of isolated axillary node recurrence in breast cancer 141(9):867-72, 2006
3. Ishitobi M, Matsushita A, T Nakayama et al; Regional lymphatic recurrence after salvage surgery for ipsilateral breast tumor recurrence of breast cancer without local treatment for regional lymphatic basin. J Surg Oncol 2014:110:265-269

Lokoregionäres Rezidiv
Therapieoptionen bei nicht kurativen Fällen

Guidelines Breast
Version 2018.1D

	Oxford		
	LoE	GR	AGO
▪ **Begleitende Radio-Chemotherapie**	3b	C	+
▪ **Hyperthermie***	1b	B	+
▪ In Kombination mit Radiotherapie	1b	C	+/-
▪ In Kombination mit Chemotherapie	4	C	+/-
▪ **Intra-arterielle Chemotherapie**	4	C	+/-
▪ **Photodynamische Therapie**	4	C	+/-
▪ **Elektrochemotherapie**	3b	C	+/-

* In Zentren, die auf der DKG-Website gelistet sind

Statement: Concomitant radio-chemotherapy

1. Mcormick B; Counterpoint: Hyperthermia with radiation therapy for chest wall recurrences. J Natl Compr Canc Netw. 5(3):345 – 8, 2007
2. Jones EL, Marks LB, Prosnitz LR; Point: Hyperthermia with radiation therapy for chest wall recurrences. J Natl Compr Canc Netw. 5(3):339-44, 2007

Statement: Hyperthermia + radiotherapy +/- chemotherapy

1. Mcormick B; Counterpoint: Hyperthermia with radiation therapy for chest wall recurrences. J Natl Compr Canc Netw. 5(3):345 – 8, 2007
2. Jones EL, Marks LB, Prosnitz LR; Point: Hyperthermia with radiation therapy for chest wall recurrences. J Natl Compr Canc Netw. 5(3):339-44, 2007
3. Bischoff J, Lindner LH, Issels RD et al; Clinical impact of locoregional hyperthermia in gynecological oncology. Zentralbl Gynakol 128(5):255-60, 2006
4. Zoul Z; Weekly paclitaxel combined with local hyperthermia in the therapy of breast cancer locally recurrent after mastectomy--a pilot experience. Onkologie. 27(4):385-8, 2004
5. Li G; Local hyperthermia combined with external irradiation for regional recurrent breast carcinoma. Int J Clin Oncol. 9(3):179-83.
6. Oldenborg S, Van Os RM, Van rij CM et al; Elective re-irradiation and hyperthermia following resection of persistent locoregional recurrent breast cancer: A retrospective study. Int J Hyperthermia 26(2):136-44, 2010

7. Vujaskovic Z, Kim DW, Jones E et al; A phase I/II study of neoadjuvant liposomal doxorubicin, paclitaxel, and hyperthermia in locally advanced breast cancer Int J Hyperthermia 26(5):514-21, 2010
8. Kouloulias VE, Koukourakis GV, Petridis AK et al; The efficacy of caelyx and hyperthermia for anticancer treatment. Recent Pat Anticancer Drug Discov 2(3):246-50, 2007
9. Kouloulias VE, Dardoufas CE, Kouvaris JR et al; Liposomal doxorubicin in conjunction with reirradiation and local hyperthermia treatment in recurrent breast cancer: a phase I/II trial. Clin Cancer Res 8(2):374-82,2002
10. Feyerabend T, Wiedemann GJ, Jäger B et al; Local hyperthermia, radiation, and chemotherapy in recurrent breast cancer is feasible and effective except for inflammatory disease. Int J Radiat Oncol Biol Phys Apr 1;49(5):1317-25, 2001
11. Linthorst M, Baaijens M, Wiggenraad R et al; Local control rate after the combination of re-irradiation and hyperthermia for irresectable recurrent breast cancer: Results in 248 patients. Radiother Oncol 2015; May 19

Statement: Intraarterial chemotherapy

1. Murakami M, Kuroda Y, Nishimura S et al; Intraarterial infusion chemotherapy and radiotherapy with or without surgery for patients with locally advanced or recurrent breast cancer. Am J Clin Oncol 24(2):185-91, 2001

Statement: Photodynamic therapy

1. Allison R, Mang T, Hewson G et al; Photodynamic therapy for chest wall progression from breast carcinoma is an underutilized treatment modality. Cancer 91(1):1-8,2001.
2. Wyss P, Schwarz V, Dobler-Girdziunaite D et al;Photodynamic therapy of locoregional breast cancer recurrences using a chlorin-type photosensitizer Int J Cancer. 93(5):720-4, 2001

Statement: Electrochemotherapy

1. Campana LG, Valpione S, Falci C et al; The activity and safety of electrochemotherapy in persistent chest wall recurrence from breastcancer after mastectomy: a phase-II study. Breast Cancer Res Treat 134(3):1169-78, 2012
2. Matthiessen LW, Johannesen HH, Hendel HW et al; Electrochemotherapy for large cutaneous recurrence of breast cancer: a phase II clinical trial. Acta Oncol 51(6):713-212012
3. Sersa G, Cufer T, Paulin SM et al; Cancer Treat Rev. Electrochemotherapy of chest wall breast cancer recurrence 38(5):379-86, 2012