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Diagnosis and Treatment of Patients with early and advanced Breast Cancer

Breast Cancer Follow-Up



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Breast Cancer Follow-Up

- **Versionen 2002–2018:**
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Müller-Schimpfle/Mundhenke / Oberhoff / Rody /
Scharl /Solbach/ Solomayer / Thomssen**
- **Version 2019:**
Mundhenke / Wöckel

Breast Cancer Follow-Up Objectives				
		Oxford		
		LoE	GR	AGO
Early detection of curable events				
▪	In-breast recurrence	1a	B	++
▪	Loco-regional recurrence*	1a	B	++
Early detection of contralateral cancers		1a	B	++
Early detection of metastases				
▪	Early detection of symptomatic metastasis	3b	C	+
▪	Early detection of asymptomatic metastasis	1a	A	-
* loco-regional recurrence is associated with higher risk for mortality in node positive, PR negative, younger patients and patients with short time from diagnosis to recurrence				



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1. De Bock GH, Bonnema J, van Der Hage J et al., Effectiveness of Routine Visits and Routine Tests in Detecting Isolated Locoregional Recurrences After Treatment for Early-Stage Invasive Breast Cancer: A Meta-Analysis and Systematic Review. J Clin Oncol 2004; 22 (19): 4010-4018.
2. Margenthaler JA, Allan E, Cheng L, et al.. Surveillance of Patients With Breast Cancer After Curative-Intent Primary Treatment: Current Practice Patterns. Journal of Oncology Practice 2012; 8(2): 79 – 83.
3. Parmeshwar R, Margenthaler JA, Allam E, et al.. Patient Surveillance After Initial Breast cancer Therapy Variation by Physician Specialty. Am J Surg 2013; 206(2): 218-222.
4. Jochelson M, Hayes DF, Ganz PA. Surveillance and Monitoring in Breast Cancer Survivors: Maximizing Benefit and Minimizing Harm. ASCO Educational Book 2013 e13 – e18.
5. Khatcheressian JL, Hurley P, Bantug E, et al.. Breast Cancer Follow-up and Management After Primary Treatment: American Society of Clinical Oncology Clinical Practice Guideline Update . J Clin Oncol. 2013 March 1; 31(7):961-965.
6. Moschetti I, Cinquini M, Lambertini M et al., Follow-up strategies for women treated for early breast cancer. Cochrane Database Syst Rev. 2016 May 27;(5):CD001768.
7. NCCN Clinical Practice Guidelines in Oncology, Breast Cancer Version 3.17-10.17;

https://www.nccn.org/professionals/physician_gls/pdf/breast.pdf

Statement: risk factors of mortality after loco-regional recurrence

1. Dent R, Valentini H, Hanna W, et al.. Factors associated with breast cancer mortality after local recurrence. Curr Oncol 2014; 21 (3): e418-25.

	Oxford		
	LoE	GR	AGO
<ul style="list-style-type: none"> Improve quality of life 	2b	B	+
<ul style="list-style-type: none"> Improve physical performance 	2a	B	+
<ul style="list-style-type: none"> Reduction and/or early detection of therapy related side effects (such as osteoporosis, cardiac failure, fatigue, neurotoxicity, lymphedema, sexual disorders, cognitive impairment, sterility and secondary tumors) and induction of therapies 	2b	B	+
<ul style="list-style-type: none"> Participation in interventional programmes during follow-up for breast cancer survivors to maximise therapy adherence, assess live-style interventions and improve quality of life 	3b	B	+



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Statement: Outcome measurements

- Ong WL, Schouwenburg MG, van Bommel ACM et al.. A Standard Set of Value-Based Patient-Centered Outcomes for Breast Cancer: The International Consortium for Health Outcomes Measurement (ICHOM) Initiative. JAMA Oncol. 2017 May 1;3(5):677-685.
- Browall M, Forsberg C, Wengström Y. Assessing patient outcomes and cost-effectiveness of nurse-led follow-up for women with breast cancer - have relevant and sensitive evaluation measures been used? J Clin Nurs. 2017 Jul;26(13-14):1770-1786.
- Cheng KKF, Lim YTE, Koh ZM et al. Home-based multidimensional survivorship programmes for breast cancer survivors. Cochrane Database Syst Rev. 2017 Aug 24;8:CD011152.

Statement: Obesity, physical activity and quality of life

- Bicego D, Brown K. Effects of Exercise on Quality of Life in Women Living with Breast Cancer: A Systematic Review. The Breast Journal 2009; 15(1): 45-51.
- Carson JW, Carson KM, Porter LS et al.. Yoga of Awareness program for menopausal symptoms in breast cancer survivors: results from a randomized trial. Support Care Cancer 2009; 17: 1301-1309.
- Vaskuil DW, van Nes JG, Junngeburt JM et al.. Maintenance of physical activity and body weight in relation to subsequent quality of life in postmenopausal breast cancer patients. Annals of Oncology 2010; 21: 2094–2101.

1. Ewertz M, Jensen MB, Gunnarsdóttir KÁ et al.. Effect of obesity on prognosis after early-stage breast cancer. J Clin Oncol 2011; 29(1): 25-31.
2. Cespedes Feliciano EM, Kroenke CH, Bradshaw PT et al.. Postdiagnosis Weight Change and Survival Following a Diagnosis of Early-Stage Breast Cancer. Cancer Epidemiol Biomarkers Prev. 2017 Jan;26(1):44-50.

Statement: Lymphedema

1. Soran A, Ozmen T, McGuire KP et al.. The importance of detection of subclinical lymphedema for the prevention of breast cancer-related clinical lymphedema after axillary lymph node dissection; a prospective observational study. Lymphat Res Biol 2014;12(4): 289-9.
2. Basta MN, Wu LC, Kanchwala SK et al.. Reliable prediction of postmastectomy lymphedema: the Risk Assessment Tool Evaluating Lymphedema. Am J Surg. 2017 Jun;213(6):1125-1133.

Statement: sexual disorders and cognitive impairment:

1. Runowcz CD, Leach CR, Henry L et al.. American Cancer Society/American Society of Clinical Oncology breast cancer survivorship care guideline. CA Cancer J Clin 2016; 66: 43-73.
2. Janeloins MC, Heckler CE, Peppone LJ et al.. Cognitive Complaints in Survivors of Breast Cancer After Chemotherapy Compared With Age-Matched Controls: An Analysis From a Nationwide, Multicenter, Prospective Longitudinal Study. J Clin Oncol. 2017 Feb 10;35(5):506-514.
3. Bernstein LJ, McCreath GA, Komeylian Z et al.. Cognitive impairment in breast cancer survivors treated with chemotherapy depends on control group type and cognitive domains assessed: A multilevel meta-analysis. Neurosci Biobehav Rev. 2017 Dec;83:417-428.

Statement: Secondary tumors:

1. Hoekstra N, Fleury E, Merino Lara TR, et al. Long-term risks of secondary cancer for various whole and partial breast irradiation

techniques. Radiother Oncol. 2018 Sep;128(3):428-433



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Breast Cancer Follow-Up Objectives

	Oxford		
	LoE	GR	AGO
<ul style="list-style-type: none"> ▪ Evaluation of current adjuvant therapy <ul style="list-style-type: none"> ▪ incl. monitoring of adherence with endocrine therapies ▪ Pro-active improvement of adherence with therapy <ul style="list-style-type: none"> ▪ Patient information about efficacy data of 5-10 years endocrine therapy ▪ Early therapy of side effects (sports, NSAIDs, vitamin D / calcium) 	2b	B	++
	5	D	++

Evaluation of current adjuvant therapy

1. Hershman DL, Kushi LH, Shao T et al.. Early Discontinuation and Nonadherence to Adjuvant Hormonal Therapy in a Cohort of 8,769 Early-Stage Breast Cancer Patients. J Clin Oncol 2010; 28: 4120-4128.
2. Lueck H-J, Hadji P, Harbeck N et al.. 24 Months Follow-Up Results from PACT (Patient's Anastrozole Compliance to Therapy Programme), a Non-Interventional Study Evaluating the Influence of a Standardized Information Service on Compliance in Postmenopausal Women with Early Breast Cancer. SABCS 2011 [P5-17-05].
3. Neven P, Markopoulos C, Tanner M et al.. The impact of educational materials on compliance and persistence rates with adjuvant aromatase inhibitor treatment: first-year results from the compliance of aromatase inhibitors assessment in daily practice through educational approach (CARIATIDE) study. Breast. 2014 Aug;23(4):393-9.
4. Hershman DL, Kushi LH, Hillyer GC et al.. Psychosocial factors related to non persistence with adjuvant endocrine therapy among women with breast cancer: the Breast Cancer Quality of Care Study (BQUAL). Breast Cancer Res Treat. 2016 May;157(1):133-43.
5. Goss PE, Ingle JN, Pritchard KI et al.. Extending Aromatase-Inhibitor Adjuvant Therapy to 10 Years. N Engl J Med. 2016 Jul 21;375(3):209-19.
6. Nabieva N, Kellner S, Fehm T et al.. Patient and tumor characteristics and their influence on early therapy persistence with letrozole in postmenopausal patients with early breast cancer. Ann Oncol. 2017 Oct 10. doi: 10.1093/annonc/mdx630.

7. Laroche F, Perrot S, Medkour T et al.. Quality of life and impact of pain in women treated with aromatase inhibitors for breast cancer. A multicenter cohort study. PLoS One. 2017 Nov 8;12(11):e0187165.

	Oxford		
	LoE	GR	AGO
<ul style="list-style-type: none"> ▪ Psycho-social aspects of support and counseling <ul style="list-style-type: none"> ▪ Pregnancy, contraception, sexuality, quality of life, menopausal symptoms, fear of recurrence ▪ Inclusion of related persons (partner, family, friends, caregivers) 	4	C	+
<ul style="list-style-type: none"> ▪ Second opinion on primary therapy 	2c	B	++
<ul style="list-style-type: none"> ▪ General counseling (genetics, HRT, prophylactic surgery, breast reconstruction) 	2c	C	+



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Statement: Psycho-social aspects

1. Drolet M, Maunsell E, Brisson J et al. Not Working 3 Years After Breast Cancer: Predictors in a Population-Based Study. J Clin Oncol 2005; 23(33): 8305-8312.
2. Scheier MF, Helgeson VS, Schulz R et al.. Interventions to Enhance Physical and Psychological Functioning Among Younger Women Who Are Ending Nonhormonal Adjuvant Treatment for Early-Stage Breast Cancer. J Clin Oncol 2005; 23(19): 4298-4311.
3. Fors EA, Bertheussen GF, Thune I et al.: Psychosocial interventions as part of breast cancer rehabilitation programs? Results from a systematic review. Psycho-Oncology 2011; 20: 909-918.
4. Silva C, Caramelo O, Almeida-Santos T et al.. Factors associated with ovarian function recovery after chemotherapy for breast cancer: a systematic review and meta-analysis. Hum Reprod. 2016 Dec;31(12):2737-2749.
5. Luke B, Brown MB, Missmer SA et al.. Assisted reproductive technology use and outcomes among women with a history of cancer. Hum Reprod. 2016 Jan;31(1):183-9.
6. Gudenkauf LM, Ehlers SL. Psychosocial interventions in breast cancer survivorship care. Breast. 2017 Nov 20;38:1-6.
7. Rogers LQ, Courneya KS, Anton PM et al.. Effects of a multicomponent physical activity behavior change intervention on fatigue, anxiety, and depressive symptomatology in breast cancer survivors: randomized trial. Psychooncology. 2017 Nov;26(11):1901-1906.

8. Y Kim, DA Kashy, RL Spillers, et al: Needs assessment of family caregivers of cancer survivors: Three cohorts comparison
Psychooncology 19:573–582,2010 Crossref, Medline, Google Scholar
9. Y Kim, RL Spillers, DL Hall: Quality of life of family caregivers 5 years after a relative's cancer diagnosis: Follow-up of the national quality of life survey for caregivers
Psychooncology 21:273–281,2012 Crossref, Medline, Google Scholar
10. BA Given, CW Given, PR Sherwood: Family and caregiver needs over the course of the cancer trajectory
J Support Oncol 10:57–64,2012 Crossref, Medline, Google Scholar

Statement: prophylactic surgery

1. Rhiem K, Engel C, Graeser M et al.. The risk of contralateral breast cancer in patients from BRCA ½ negative high risk families as compared to patients from BRCA1 or BRCA2 positive families: a retrospective cohort study. Breast Cancer Res. 2012; 14(6): R156.

<h2>Breast Cancer Follow-Up Objectives</h2>				
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		Oxford		
		LoE	GR	AGO
	▪ Treatment of type II-diabetes (> 25% undetected DM in postmenopausal BC patients)	5	D	++
	▪ Weight intervention (if BMI < 18.5 and > 40)	2a	B	+
	▪ Nightly fastening > 13h	2b	B	+
	▪ Reduction of dietary intake (at least 15 % calories from fat) in HR neg. breast cancer patients is associated with improved overall survival	2b	B	+
	▪ Smoking cessation (mortality increased 2 fold, mortality not directly BC associated 4 fold increase)	2b	B	++
	▪ Alcohol consumption reduction (below 6g/d)	2b	B	+
	▪ Moderate sport (in patients with reduced physical activity prior to diagnosis)	1b	A	++
▪ Distress reduction	3b	B	+	

1. Onitilo AA, Donald M, Stankowski RV et al.. Breast and prostate cancer survivors in a diabetic cohort: results from the Living with DiabetesStudy. Clin Med Res. 2013 Dec;11(4):210-8.
2. Anderson C, Sandler DP, Weinberg CR et al.. Age- and treatment-related associations with health behavior change among breast cancer survivors. Breast. 2017 Jun;33:1-7.
3. Syrowatka A, Motulsky A, Kurteva S et al.. Predictors of distress in female breast cancer survivors: a systematic review. Breast Cancer Res Treat. 2017 Sep;165(2):229-245. Review.
4. Gudenkauf LM, Ehlers SL. Psychosocial interventions in breast cancer survivorship care. Breast. 2017 Nov 20;38:1-6. Review.
5. Mehra K, Berkowitz A, Sanft T.D et al.. Physical Activity, and Body Weight in Cancer Survivorship. Med Clin North Am. 2017 Nov;101(6):1151-1165. Review
6. Haykowsky MJ, Scott JM, Hudson K et al.. Lifestyle Interventions to Improve Cardiorespiratory Fitness and Reduce Breast Cancer Recurrence. Am Soc Clin Oncol Educ Book. 2017;37:57-64.
7. Chlebowski RT, Aragaki AK, Anderson GL et al. Low-Fat Dietary Pattern and Breast Cancer Mortality in the Women's Health Initiative Randomized Controlled Trial. J Clin Oncol. 2017 Sep 1;35(25):2919-2926.
8. Marinac CR, Nelson SH, Breen CI et al..Prolonged Nightly Fasting and Breast Cancer Prognosis. JAMA Oncol. 2016 Aug 1;2(8):1049-55.

1. Runowcz CD, Leach CR, Henry L et al.. American Cancer Society/American Society of Clinical Oncology breast cancer survivorship care guideline. CA Cancer J Clin 2016; 66: 43-73.

Weight intervention.

1. Chajès V, Romieu I. Nutrition and breast cancer. Maturitas, 2014; 77 (1): 7–11.

Moderate sport intervention when physical activity was reduced

1. Chlebowski RT. Nutrition and physical activity influence on breast cancer incidence and outcome. Breast 2013; Aug;22 Suppl 2: S30-7.
2. Patsou ED, Alexias GD, Anagnostopoulos FG et al.. Effects of physical activity on depressive symptoms during breast cancer survivorship: a meta-analysis of randomised control trials. ESMO Open. 2017 Dec 11;2(5):e000271



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Nightly fasting

Prolonged nightly fasting improves prognosis in breast cancer patients

retrospective cohort study:

2413 BC-pat. (no diabetes), nightly fasting more or less than 13 hrs

Fasting < 13 hrs: HR 1.36, 36% increase of risk for recurrence
HR 1.21, n.s. increase of risk for mortality

every 2-hrs-prolonged fasting was correlated with a 20% increase of sleeping duration

Marinac CR, Nelson SH, Breen CI et al. JAMA Oncol 2016; 2:1049-1055



Follow-up Objectives Reported by Patients

- Examination of the breast
- Reassurance
- Guidance of patients, answering questions
- Evaluation of treatment and treatment of side effects
- Psychosocial support

Oxford LoE 4 C

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Kwast AB, Drossaert CH, Siesling S et al. Follow-up working group. Breast cancer follow-up: from the perspective of health professionals and patients. Eur J Cancer Care (Engl). 2013; 22(6): 754-64.

Statement: for all statements see most recent literature see at Survivorship care guidelines of ASC and ASCO

1. Runowcz CD, Leach CR, Henry L et al..American Cancer Society/American Society of Clinical Oncology breast cancer survivorship care guideline. CA Cancer J Clin 2016; 66: 43-73.

		Oxford		
		LoE	GR	AGO
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	▪ History (specific symptoms)	1a	A	++
	▪ Physical examination	1a	B	++
	▪ Breast self-examination	5	D	+
	▪ Mammography	1a	A	++
	▪ Sonography of the breast	2a	B	++
	▪ Routine MRI of the breast*	3a	B	+/-
	▪ MRI of the breast in case of inconclusive conventional imaging	3b	B	+
	▪ Pelvic examination	5	D	++
	▪ DEXA-scan at baseline and repeat scan according to individual risk in women with premature menopause or women taking an AI	5	D	+
* Consider in case of increased risk (age <50y, HR neg., diagnostic assessability C/D in mammography + ultrasound)				

1. Margenthaler JA, Allan E, Cheng L, et al.. Surveillance of Patients With Breast Cancer After Curative-Intent Primary Treatment: Current Practice Patterns. *Journal of Oncology Practice* 2012; 8(2): 79 – 83.
2. Parmeshwar R, Margenthaler JA, Allam E et al.. Patient Surveillance After Initial Breast cancer Therapy Variation by Physician Specialty. *Am J Surg* 2013; 206(2): 218-222.
3. Jochelson M, Hayes DF, Ganz PA. Surveillance and Monitoring in Breast Cancer Survivors: Maximizing Benefit and Minimizing Harm. *ASCO Educational Book* 2013 e13 – e18.
4. Khatcheressian JL, Hurley P, Bantug E, et al.. Breast Cancer Follow-up and Management After Primary Treatment: American Society of Clinical Oncology Clinical Practice Guideline Update . *J Clin Oncol.* 2013 March 1; 31(7):961-965.
5. Bychkovsky BL, Lin NU. Imaging in the evaluation and follow-up of early and advanced breast cancer: When, why, and how often? *Breast.* 2017 Feb;31:318-324 Review.
6. Expert Panel on Breast Imaging: Moy L, Bailey L, D'Orsi C et al..ACR Appropriateness Criteria[®] Stage I Breast Cancer: Initial Workup and Surveillance for Local Recurrence and Distant Metastases in Asymptomatic Women. *J Am Coll Radiol.* 2017 May;14(5S):S282-S292.
7. Lam DL, Houssami N, Lee JM. Imaging Surveillance After Primary Breast Cancer Treatment. *AJR Am J Roentgenol.* 2017 Mar;208(3):676-686. Review.

2. Warner E. The role of magnetic resonance imaging in screening women at high risk of breast cancer. *Top Magn Reson Imaging*. 2008; 19(3):163-9. Review.
3. Lehman CD, Lee JM, DeMartini WB et al. Screening MRI in Women With a Personal History of Breast Cancer. *J Natl Cancer Inst*. 2016 Jan 7;108(3).
4. Shah C, Ahlawat S, Khan A et al.. The Role of MRI in the Follow-up of Women Undergoing Breast-conserving Therapy. *Am J Clin Oncol*. 2016 Jun;39(3):314-9.
5. Cho N, Han W, Han BK et al..Breast Cancer Screening With Mammography Plus Ultrasonography or Magnetic Resonance Imaging in Women 50 Years or Younger at Diagnosis and Treated With Breast Conservation Therapy. *JAMA Oncol*. 2017 Nov 1;3(11):1495-1502.
6. Kim EJ, Kang BJ, Kim SH et al.Diagnostic Performance of and Breast Tissue Changes at Early Breast MR Imaging Surveillance in Women after Breast Conservation Therapy.*Radiology*. 2017 Sep;284(3):656-666.
7. Tadros A, Arditi B, Wertz C et al.Utility of surveillance MRI in women with a personal history of breast cancer.*Clin Imaging*. 2017 Nov - Dec;46:33-36.

Statement: Pelvic examination Expert Opinion

1. Cohen I, Beyth Y, Tepper R. The role of ultrasound in the detection of endometrial pathologies in asymptomatic postmenopausal breast cancer patients with tamoxifen treatment. *Obstet Gynecol Surv* 1998; 53(7): 429-38.
2. Giorda G, Crivellari D, Veronesi A et al.. Comparison of ultrasonography, hysteroscopy, and biopsy in the diagnosis of endometrial lesions in postmenopausal tamoxifen-treated patients. *Acta Obstet Gynecol Scand* 2002; 81(10):975-80.
3. Robertson C1, Arcot Ragupathy SK, Boachie C et al.: The clinical effectiveness and cost-effectiveness of different surveillance mammography regimens after the treatment for primary breast cancer: systemic reviews registry database analyses and economic evaluation. *Health Technol Assess*. 2011;15(34): 1-322.
4. Geurts SM, de Vegt F, Siesling S et al. Pattern of follow up care and early relapse detection in breast cancer patients. *Breast Cancer Res Treat* 2012; 136(3): 859-68.
5. Khatcheressian JL, Hurley P, Bantug E et al.. Breast Cancer Follow-up and Management After Primary Treatment: American Society of Clinical Oncology Clinical Practice Guideline Update . *J Clin Oncol*. 2013 March 1; 31(7):961-965.

Statement: DEXA scan Expert Opinion

1. Mahon SM, Williams MT, Spies MA: Screening for second cancers and osteoporosis in long-term survivors. Cancer Pract 2000; 8(6): 282-90.
2. Runowicz CD, Leach CR, Henry L et al..American Cancer Society/American Society of Clinical Oncology breast cancer survivorship care guideline. CA Cancer J Clin 2016; 66: 43-73.



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Routine Follow-Up Examinations in Asymptomatic Patients

Oxford		
LoE	GR	AGO
1a	A	-
2a	D	-
2a	D	-
2b	B	-
2b	B	-

- **Routine biochemistry (incl. tumor markers)**
- **Ultrasound of the liver**
- **Bone scan**
- **Chest X-ray**
- **CT of chest, abdomen and pelvis**
- **Detection of isolated / circulating tumor cells**
- **PET**
- **Whole body MRI**

1. Bychkovsky BL, Lin NU. Imaging in the evaluation and follow-up of early and advanced breast cancer: When, why, and how often? Breast. 2017 Feb;31:318-324 Review.
2. Lam DL, Houssami N, Lee JM. Imaging Surveillance After Primary Breast Cancer Treatment. AJR Am J Roentgenol. 2017 Mar;208(3):676-686. Review.
3. Expert Panel on Breast Imaging; Moy L, Bailey L, D'Orsi C, Green ED et al. ACR Appropriateness Criteria[®] Stage I Breast Cancer: Initial Workup and Surveillance for Local Recurrence and Distant Metastases in Asymptomatic Women. J Am Coll Radiol. 2017 May;14(5S):S282-S292.
4. Lafranconi A, Pylkkänen L, Deandrea S et al.. Intensive follow-up for women with breast cancer: review of clinical, economic and patient's preference domains through evidence to decision framework. Health Qual Life Outcomes. 2017 Oct 19;15(1):206.

Statement: Magnetic resonance imaging (MRI) of the breast

1. DeMartini W, Lehman C. A review of current evidence-based clinical applications for breast magnetic resonance imaging. Top Magn Reson Imaging 2008; 19(3):143-50. Review.
2. Warner E. The role of magnetic resonance imaging in screening women at high risk of breast cancer. Top Magn Reson Imaging. 2008; 19(3):163-9. Review.
3. Shah C, Ahlawat S, Khan A et al.. The Role of MRI in the Follow-up of Women Undergoing Breast-conserving Therapy. Am J Clin Oncol. 2016 Jun;39(3):314-9.

1. Ide M. Cancer screening with FDG-PET. Q J Nucl Med Mol Imaging 2006; 50(1): 23-7.
2. Schöder H, Gönen M. Screening for cancer with PET and PET/CT: potential and limitations. J Nucl Med 2007; 48 Suppl 1:4S-18S. Review.
3. Lei L, Wang X, Chen Z. PET/CT Imaging for Monitoring Recurrence and Evaluating Response to Treatment in Breast Cancer. Adv Clin Exp Med. 2016 Mar-Apr;25(2):377-82.
4. Cho IH, Kong EJ. Potential Clinical Applications of ¹⁸F-Fluorodeoxyglucose Positron Emission Tomography/Magnetic Resonance Mammography in Breast Cancer. Nucl Med Mol Imaging. 2017 Sep;51(3):217-226. Review.
5. Melsaether A, Moy L. Breast PET/MR Imaging. Radiol Clin North Am. 2017 May;55(3):579-589. Review.



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Early Detection of Potentially Curable Events

	Oxford		
	LoE	GR	AGO
Local recurrence & in-breast recurrence:			
▪ Incidence 7–20% (depending on time of F/U)			
▪ Breast self-examination	5	D	+
▪ Physical examination, mammography & US	1a	A	++
▪ Magnetic resonance imaging (MRI)*	3a	B	+/-

* Consider in case of increased risk (age <50y, HR neg., diagnostic assessability C/D in mammography + ultrasound)

Statement incidence

1. Perry NM. Quality assurance in the diagnosis of breast disease. EUSOMA Working Party. Eur J Cancer 2001; 37: 159-172
2. 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 2006; 24:2028-2037

Statement breast self examination

1. Thomas DB, Gao DL, Ray RM et al.. Randomized trial of breast self-examination in Shanghai: final results. J Natl Cancer Inst 2002; 94(19): 1445-57.
2. Khatcheressian JL, Wolff AC, Smith TJ. American Society of Clinical Oncology 2006 update of the breast cancer follow-up and management guidelines in the adjuvant setting. J Clin Oncol. 2006 Nov 1;24(31):5091-7.
3. Montgomery DA, Krupa K, Cooke TG. Follow-up in breast cancer: does routine clinical examination improve outcome? A systematic review of the literature. Br J Cancer 2007; 97(12): 1632-41.

Statement physical examination, mammography & US & MRI

1. Beinart G, Gonzalez-Angulo AM, Broglio K. Clinical course of 771 patients with bilateral breast cancer: characteristics associated with overall and recurrence-free survival. Clin Breast Cancer 2007; 7(11): 867-74



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Early Detection of Potentially Curable Events

	Oxford		
	LoE	GR	AGO
Contralateral breast cancer:			
▪ Rel. risk: 2,5–5			
▪ Incidence: 0,5–1,0 % / year			
▪ Breast self-examination	5	D	+
▪ Physical examination, mammography & US	1a	A	++
▪ Routine breast MRI*	3b	B	+/-
 Male breast cancer: procedures as in women with breast cancer**			
	5	D	+

*Consider in case of increased risk: age <50y, HR neg., diagnostic assessability C/D in mammography + ultrasound.
** See Chapter Breast Cancer Specific Situations

Statement risk and incidence

1. Hoening MJ, Aleman BM, Hauptmann M et al. Roles of radiotherapy and chemotherapy in the development of contralateral breast cancer J Clin Oncol 2008; 26(34): 5561-8.
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	Oxford		
	LoE	GR	AGO
Unrelated site carcinoma:			
▪ MDS (RR 10,9), AML (RR 2,6-5,3), Colon RR 3,0; endometrium RR 1,6 ovary RR 1,5; lymphoma RR 7			
▪ Screening for secondary malignancies according to current guidelines	5	D	++
▪ Pelvic examination and PAP smear	5	D	++
▪ Routine endometrial ultrasound / biopsy	1b	B	-



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Statement: Screening for secondary malignancies according to current guidelines

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Statement: Pelvic examination and PAP smear

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2. Fishman DA, Cohen L, Blank SV et al.. The role of ultrasound evaluation in the detection of early-stage epithelial ovarian cancer. Am J Obstet Gynecol 2005; 192(4): 1214-21.
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4. Chan JK, Manuel MR, Cheung MK et al.. Breast cancer followed by corpus cancer: is there a higher risk for aggressive histologic subtypes? Gynecol Oncol 2006; 102(3): 508-12.

Statement: Endometrial ultrasound / biopsy

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Statement: Marrow neoplasms after adjuvant breast cancer therapy

1. Wolff AC, Blackford AL, Visvanathan K et al. Risk of marrow neoplasms after adjuvant breast cancer therapy: the national

comprehensive cancer network experience. J Clin Oncol. 2015; 33(4): 340-8.

Statement: Secondary lung tumors:

1. Hoekstra N, Fleury E, Merino Lara TR et al. Long-term risks of secondary cancer for various whole and partial breast irradiation techniques. Radiother Oncol. 2018 Sep;128(3):428-433



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Follow-Up Care for Breast Cancer

Recommendations for asymptomatic pts.
(mod. nach ASCO-ACS Empfehlungen 2016, NCCN 3.2017 und S3-Leitlinie 2017)

Clinical follow-up	Follow-Up*				Screening/ Follow up	
Years after primary therapy	1	2	3	4	5	> 5
History, physical examination, counseling	inv.: every 3 months			inv.: every 6 months		inv.: every 12 months
Self-examination	monthly					
Imaging modalities and biochemistry	indicated only by complaints, clinical findings or suspicion of recurrence					
Mammography and additionally sonography	BCT**	ipsilat.: every 12 months contralat.: every 12 months		on both sides: every 12 months		
	Mastectomy	contralateral every 12 months				

* Continued follow-up visits if still on adjuvant treatment
** In pts with breast-conserving therapy (BCT): First mammography 1 year after initial mammography or at least 6 months after completion of radiotherapy

1. Runowcz CD, Leach CR, Henry L et al. American Cancer Society/American Society of Clinical Oncology breast cancer survivorship care guideline. CA Cancer J Clin 2016; 66: 43-73
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https://www.nccn.org/professionals/physician_gls/pdf/breast.pdf
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Breast Cancer Follow-up Duration and Breast Nurses

Oxford		
LoE	GR	AGO
1c	A	++
1c	A	+
2b	B	+/-*

- **Duration of follow-up**
 - until 5 yrs
 - until 10 yrs
- **Surveillance by specialized breast nurses**

* Studies recommended

1. Sheppard C. Breast cancer follow-up: literature review and discussion. Eur J Oncol Nurs 2007;11(4):340-7.
2. van Hezewijk M, Ranke GM, van Nes JG et al. Patients' needs and preferences in routine follow-up for early breast cancer; an evaluation of the changing role of the nurse practitioner. Eur J Surg Oncol 2011; 37(9): 765-73.
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Luminal-like, HER2-positive and Triple-negative Breast Cancer Patients

- **Intrinsic typing of breast cancer leads to the development of subgroups with different courses of disease**
- **Postoperative surveillance should be tailored to specific breast cancer type and their associated time periods of recurrence.**
- **ER-positive patients have a stable risk of recurrence of multiple years. Long term surveillance is recommended.**
- **In contrast, patients with HER2-positive disease and TNBC have an increased risk of recurrence in the early follow up phase. Surveillance should be adjusted accordingly.**

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Ribelles et al. BCR 2013

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