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Guidelines Breast
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Diagnostik und Therapie früher und fortgeschrittener Mammakarzinome

Brustkrebs Nachsorge



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- **Versionen 2002–2018:**
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 Janni / Kaufmann / Kümmel / Lux / Maass / Möbus /
 Müller-Schimpfle/ Mundhenke / Oberhoff / Rody /
 Scharl / Solbach/ Solomayer / Thomssen**

- **Version 2019:**
Mundhenke/ Wöckel

Aktualisierung der Therapieempfehlungen nach Durchsicht der ASCO und ACS Guidelines*, sowie der S3 Leitlinie

Durchgeführte „Medline“ Suche nach „Surveillance Breast Cancer“ und „Follow up primary breast cancer“ (2018/01-2019/01)

*Runowicz CD et al. , American Cancer Society/American Society of Clinical Oncology Breast Cancer Survivorship Care Guideline, JCO 34 :611-635,



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Brustkrebs Nachsorge Ziele

	Oxford		
	LoE	GR	AGO
Früherkennung von heilbaren Rezidiven			
▪ Intramammäre Rezidive	1a	B	++
▪ Lokoregionäre Rezidive*	1a	B	++
Früherkennung kontralateraler Karzinome			
	1a	B	++
Früherkennung von Metastasen			
▪ Früherkennung symptomatischer Metastasen	3b	C	+
▪ Früherkennung asymptomatischer Metastasen	1a	A	-
* Das lokoregionäre Rezidiv ist mit einem erhöhten Mortalitätsrisiko bei nodalpositiven, PR-negativen, jüngeren Patientinnen und einem kurzen Zeitintervall von Erstdiagnose bis Rezidiv verbunden.			



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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.

Brustkrebs Nachsorge Ziele			
	Oxford		
	LoE	GR	AGO
▪ Verbesserung der Lebensqualität	2b	B	+
▪ Verbesserung der körperlichen Leistungsfähigkeit	2a	B	+
▪ Reduktion bzw. zeitnahe Erkennung therapiebedingter Nebenwirkungen (wie z.B. Osteoporose, Herzinsuffizienz, Fatigue, Neuro-toxizität, Lymphödeme, sexuelle Beschwerden, kognitive Einschränkungen, Sterilität, Zweitmalignome) und Veranlassung notwendiger Therapien	2b	B	+
▪ Teilnahme an Interventionsprogrammen in der Nachsorge (z.B. Lifestyle, Therapieadhärenz etc.)	3b	B	+

Statement: Outcome measurements

1. 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.
2. 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.
3. 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

1. 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.
2. 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.
3. 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. 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.
2. Janelins 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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Inhalte und Ziele


Oxford		
LoE	GR	AGO
2b	B	++
5	D	++

- **Evaluation laufender adjuvanter Therapien**
 - inkl. Überprüfung der Adhärenz endokriner Therapien
- **Pro-aktive Verbesserung der Adhärenz anstreben durch:**
 - Patientenaufklärung über die günstigen Daten einer 5- bis 10-jährigen adj. endokrinen Therapie
 - Frühzeitige Therapie von Nebenwirkungen (z.B. Sport-intervention, NSAID, Vitamin D / Calcium-Substitution)

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.

Brustkrebs Nachsorge Inhalte und Ziele			
	Oxford		
	LoE	GR	AGO
<div>  <p>© AGO e. V. in der DGGG e.V. sowie in der DKG e.V.</p> <p>Guidelines Breast Version 2019.1D</p> <p>www.ago-online.de</p> <p>FORSCHEN LEHREN HEILEN</p> </div> <ul style="list-style-type: none"> ■ Psychosoziale Aspekte der Beratung <ul style="list-style-type: none"> ■ Schwangerschaft, Kontrazeption, Sexualität, Lebensqualität, Menopausensyndrom, Angst vor Rezidiv ■ Einbeziehung von Bezugspersonen (Partner, Familie, Freunde, Betreuer) ■ Zweitmeinung zur Primärtherapie ■ Allgemeine Beratung (z.B. Genetik, HRT, prophylaktische Operationen, Brustrekonstruktion) 	4	C	+
	2c	B	++
	2c	C	+

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.

Brustkrebs Nachsorge

Inhalte und Ziele

Interventionen hinsichtlich Begleiterkrankungen und Lebensstil, um einen negativen Einfluss auf den Krankheitsverlauf zu reduzieren

	Oxford		
	LoE	GR	AGO
▪ Einstellung Diabetes mellitus (Typ II) (> 25% unerkannter DM bei postmenopausalem MaCa)	5	D	++
▪ Gewichtsintervention (bei BMI <18,5 und > 40)	2a	B	+
▪ Nächtliche Nahrungskarenz > 13h	2b	B	+
▪ Fettreduzierte Diät (mindestens 15 % Kalorienreduktion durch Fett) ist mit einem verbesserten Gesamtüberleben bei HR neg. Patientinnen verbunden	2b	B	+
▪ Intervention bei Nikotinabusus (durch Rauchen 2 x erhöhte brustkrebspezifische, 4 x erhöhte nicht-brustkrebspezifische Mortalität)	2b	B	++
▪ Alkoholkonsum reduzieren unter 6 g/d	2b	B	+
▪ Moderate Sportintervention bei Bewegungsmangel	1b	A	++
▪ Disstress- Reduktion	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.

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.


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

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



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Nachsorgeziele – von Patientinnenseite gesehen

Oxford LoE 4 C

- **Untersuchung der Brust**
- **Beruhigung und Bestätigung**
- **Führung der Patientinnen, Fragen beantworten**
- **Überprüfung der Behandlung und potenzieller Nebenwirkungen**
- **Psychosoziale Unterstützung**

1. 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.

Routine-Nachsorgeuntersuchungen bei asymptomatischen Patientinnen			
	Oxford		
	LoE	GR	AGO
Untersuchungen			
▪ Anamnese (spezifische Symptome)	1a	A	++
▪ Untersuchung	1a	B	++
▪ Brust-Selbst-Untersuchung	5	D	+
▪ Mammographie	1a	A	++
▪ Mammasonographie	2a	B	++
▪ Mamma-MR in der Routine*	3a	B	+/-
▪ Mamma-MR bei unklarer Mammographie / -sonographie	3b	B	+
▪ Gynäkologische Untersuchung	5	D	++
▪ DXA-Scan zu Therapiebeginn und risikoadaptiert in regelmäßigen Abständen bei Frauen mit frühzeitiger Menopause und Frauen unter AI-Therapie	5	D	+

* Bei erhöhtem Risiko erwägen (Alter unter 50 J., HR-, Beurteilbarkeit in MG+US C/D)

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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, Wetz 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-Nachsorgeuntersuchungen bei asymptomatischen Patientinnen

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


- Routinelabor (inkl. Tumormarker)
- Lebersonographie
- Skelettszintigraphie
- Thorax-Röntgen
- CT-Untersuchungen (Thorax, Abdomen und Becken)
- Detektion isolierter / zirkulierender Tumorzellen
- PET-CT
- Ganzkörper-MRT

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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Früherkennung von potenziell heilbaren Erkrankungen

Lokoregionäre Rezidive (Thoraxwand, intramammäre Rezidive):

- Inzidenz 7–20 %
(abhängig von der Zeit der Nachbeobachtung)
- Brust-Selbst-Untersuchung
- Klin. Untersuchung, Mammographie & US
- Mamma-MR*

	Oxford LoE	GR	AGO
	5	D	+
	1a	A	++
	3a	B	+/-

* Bei erhöhtem Risiko erwägen (Alter unter 50 J., HR-, Beurteilbarkeit in MG+US C/D)

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

Examinations for Early Detection of Locoregional Recurrence-A Survival Impact Study. *Ultrasound Med Biol*. 2016 Sep;42(9):2058-64.

8. Freedman RA, Keating NL, Partridge AH et al..Surveillance Mammography in Older Patients With Breast Cancer-Can We Ever Stop?: A Review. *JAMA Oncol*. 2017 Mar 1;3(3):402-409.
9. Tadros A, Arditi B, Weltz C et al..Utility of surveillance MRI in women with a personal history of breast cancer. *Clin Imaging*. 2017 Nov - Dec;46:33-36.

Früherkennung von potenziell heilbaren Erkrankungen			
	Oxford		
	LoE	GR	AGO
Kontralaterales Mammakarzinom:			
▪ Rel. Risiko: 2,5–5			
▪ Inzidenz: 0,5–1,0 % / Jahr			
▪ Brust-Selbst-Untersuchung	5	D	+
▪ Klin. Untersuchung, Mammographie & US	1a	A	++
▪ Mamma-MR*	3b	B	+/-
Männliches Mammakarzinom: Vorgehen analog wie beim Karzinom der Frau**			
	5	D	+
<ul style="list-style-type: none"> • Bei erhöhtem Risiko erwägen (Alter unter 50 J., HR-, Beurteilbarkeit in MG+US C/D) • ** S. Kapitel „Brustkrebs: Spezielle Situationen/Männliches Mammakarzinom“ 			

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Statement risk and incidence

1. Hooning 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.
2. Yerushalmi R, Kennecke H, Woods R et al. Does multicentric/multifocal breast cancer differ from unifocal breast cancer? An analysis of survival and contralateral breast cancer incidence. Breast Cancer Res Treat 2009; 117(2): 365-70.
3. Bertelsen L, Mellekjær L, Christensen J et al. Age-Specific Incidence of Breast Cancer in Breast Cancer Survivors and Their First-Degree Relatives. Epidemiology 2009; 20(2): 175 – 80.

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. Montgomery DA, Krupa K, Cooke TG et al.. 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.
3. 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.

systematic review of the literature. Br J Cancer. 2007; 97(12): 1632-41.

3. 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.
4. Kim JY1, Cho N, Koo HR et al. Unilateral breast cancer: screening of contralateral breast by using preoperative MR imaging reduces incidence of metachronous cancer.Radiology. 2013 Apr;267(1):57-66.
5. Freedman RA, Keating NL, Partridge AH et al.. Surveillance Mammography in Older Patients With Breast Cancer-Can We Ever Stop?: A Review. JAMA Oncol. 2017 Mar 1;3(3):402-409.
6. Vapiwala N, Hwang WT, Kushner CJ et al..No impact of breast magnetic resonance imaging on 15-year outcomes in patients with ductal carcinoma in situ or early-stage invasive breast cancer managed with breast conservation therapy. Cancer. 2017 Apr 15;123(8):1324-1332.
7. van Bodegraven EA, van Raaij JC, Van Goethem M et al. Guidelines and recommendations for MRI in breast cancer follow-up: A review. Eur J Obstet Gynecol Reprod Biol. 2017 Nov;218:5-11.

Statement surveillance of male breast cancer

1. Ferzoco RM, Ruddy KJ, Optimal delivery of male breast cancer follow-up care: improving outcomes, Breast Cancer: Targets and Therapy 2015;7 371–379
2. Auvinen A, Curtis RE, Ron E. Risk of subsequent cancer following breast cancer in men. J Natl Cancer Inst. 2002;94(17):1330–1332.

	Oxford		
	LoE	GR	AGO
Sonstige Zweitkarzinome:			
▪ MDS (RR 10,9), AML (RR 2,6-5,3), Kolorektal RR 3,0; Endometrium RR 1,6, Ovar RR 1,5; Lymphome RR 7			
▪ Screening auf Zweitmalignome entsprechend der gültigen Leitlinien	5	D	++
▪ Gyn. Krebsfrüherkennungsuntersuchung	5	D	++
▪ Routinemäßige transvaginale Sonographie / Biopsie des Endometriums	1b	B	-



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Statement: Risk

1. Brown LM, Chen BE, Pfeiffer RM et al. Risk of second non-hematological malignancies among 376,825 breast cancer survivors. Breast Cancer Res Treat 2007; 106(3): 439-51.
2. Kirova YM, De Rycke Y, Gambotti L et al. Second malignancies after breast cancer: the impact of different treatment modalities. Br J Cancer 2008 Mar 11; 98(5): 870-4.
3. Schaapveld M, Visser O, Louwman MJ et al.. Risk of new primary nonbreast cancers after breast cancer treatment: a Dutch population-based study. J Clin Oncol 2008; 26(8): 1239-46.
4. Andersson M, Jensen MB, Engholm G et al.. Risk of second primary cancer among patients with early operable breast cancer registered or randomised in Danish Breast Cancer cooperative Group (DBCG) protocols of the 77, 82 and 89 programmes during 1977-2001. Acta Oncol 2008; 47(4): 755-64.
5. CG Valentini, L Fianchi, MT Voso et al. Incidence of Acute Myeloid Leukemia after Breast Cancer, Mediterr J Hematol Infect Dis. 2011; 3(1): e2011069.
6. Kaplan H1, Malmgren J, De Roos AJ., Risk of myelodysplastic syndrome and acute myeloid leukemia post radiation treatment for breast cancer: a population-based study. Breast Cancer Res Treat. 2013 Feb;137(3):863-7.
7. Kaplan HG, Malmgren JA, Atwood MK, Increased incidence of myelodysplastic syndrome and acute myeloid leukemia following breast cancer treatment with radiation alone or combined with chemotherapy: a registry cohort analysis 1990-2005. BMC Cancer. 2011 Jun 21;11:260. doi: 10.1186/1471-2407-11-260.

Statement: Screening for secondary malignancies according to current guidelines

1. 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: Pelvic examination and PAP smear

1. Gerber B, Krause A, Müller H et al.. Ultrasonographic detection of asymptomatic endometrial cancer in postmenopausal patients offers no prognostic advantage over symptomatic disease discovered by uterine bleeding. Eur J Cancer 2001; 37(1): 64-71.
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.
3. Rieck GC, Lim K, Rogers MT et al. Screening for familial ovarian cancer--management and outcome of women with moderate to high risk of developing ovarian cancer. Int J Gynecol Cancer 2006;16 Suppl 1: 86-91.
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

1. Gerber B, Krause A, Müller H, et al.Effects of adjuvant tamoxifen on the endometrium in postmenopausal women with breast cancer: a prospective long-term study using transvaginal ultrasound. J Clin Oncol 2000; 18(20): 3464-70
2. Barakat RR, Gilewski TA, Almadrones L et al.. Effect of adjuvant tamoxifen on the endometrium in women with breast cancer: a prospective study using office endometrial biopsy. J Clin Oncol 2000;18(20): 3459-63.
3. Fung MF, Reid A, Faught W et al. Prospective longitudinal study of ultrasound screening for endometrial abnormalities in women with breast cancer receiving tamoxifen. Gynecol Oncol 2003; 91(1): 154-9.


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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Brustkrebs Nachsorge


Synopsis

Empfehlung für asymptomatische Patientinnen
(mod. nach ASCO-ACS Empfehlungen 2016, NCCN 3.2017 und S3-Leitlinie 2017)

		Nachsorge/Follow-Up*				Screening/ Follow up
		1	2	3	4	
Jahre nach Primärtherapie						
Anamnese, klinische Untersuchung, Beratung		inv.: alle 3 Mon.			inv.: alle 6 Mon.	
Selbstuntersuchung		monatlich				
Bildgebende Diagnostik, Laboruntersuchungen		indiziert nur bei Symptomatik +/- Befunden +/- Verdacht auf Rezidiv/Metastasen				
Mammo- graphie und ergänzend Sono-graphie	BET**	ipsilat.: alle 12 Mon. kontralat.: alle 12 Mon.		beidseits: alle 12 Monate		
	Mastektomie	kontralateral alle 12 Monate				

* Fortlaufende "Nachsorgeuntersuchungen" bei noch laufender adjuvanter Therapie
** nach BET: Erste Mammographie 1 Jahr nach initialer Mammographie, oder zumindest 6 Monate nach abgeschlossener Radiatio

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. Merkow RP, Korenstein D, Yeahia R et al. Quality of Cancer Surveillance Clinical Practice Guidelines: Specificity and Consistency of Recommendations. JAMA Intern Med. 2017 May 1;177(5):701-709.
3. Muradali D, Kennedy EB, Eisen A et al. Breast screening for survivors of breast cancer: A systematic review. Prev Med. 2017 Oct;103:70-75.
4. NCCN Clinical Practice Guidelines in Oncology, Breast Cancer Version 3.17-10.17;
https://www.nccn.org/professionals/physician_gls/pdf/breast.pdf
5. Interdisziplinäre S3-Leitlinie für die Früherkennung, Diagnostik, Therapie und Nachsorge des Mammakarzinoms. Langversion 4.0 – Dezember 2017 AWMF-Registernummer: 032-045OL; http://www.leitlinienprogramm-onkologie.de/fileadmin/user_upload/LL_Mammakarzinom_Langversion_4.0.pdf



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Brustkrebs Nachsorge


Dauer und „Breast Nurses“

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

- **Dauer der Nachsorge**
 - Bis zu 5 Jahre
 - Bis zu 10 Jahre
- **Nachsorge durch spezialisierte „Breast nurses“**

* Studien empfohlen

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.
3. Interdisziplinäre S3-Leitlinie für die Früherkennung, Diagnostik, Therapie und Nachsorge des Mammakarzinoms. Langversion 4.0 – Dezember 2017 AWMF-Registernummer: 032-045OL; http://www.leitlinienprogramm-onkologie.de/fileadmin/user_upload/LL_Mammakarzinom_Langversion_4.0.pdf
4. NCCN Clinical Practice Guidelines in Oncology, Breast Cancer Version 3.17-10.17; https://www.nccn.org/professionals/physician_gls/pdf/breast.pdf



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Luminal-like, HER2-positive and Triple-negative Breast Cancer Patients

- **Intrinsic typing of breast cancer leads to subgroups with different course of disease. Thus, postoperative surveillance should be adapted to specific time-dependent hazards of recurrence.**
- **ER-positive patients have stable risk over many years requiring long term surveillance.**
- **However, patients with HER2-positive disease and TNBC have more risk in the early phase of follow-up and should therefore receive more intense surveillance in the first years of follow-up.**

Ribelles et al. BCR 2013

1. Voduc KD, Cheang MC, Tyldesley S et al. Breast cancer subtypes and the risk of local and regional relapse. J Clin Oncol 2010; 28(10): 1684-91.
2. Ribelles N, Perez-Villa L, Jerez JM et al.. Pattern of recurrence of early breast cancer is different according to intrinsic subtype and proliferation index. Breast Cancer Res 2013;15(5):R98.
3. Metzger-Filho O1, Sun Z, Viale G et al.. Patterns of Recurrence and Outcome According to Breast Cancer Subtypes in Lymph Node–Negative Disease: Results From International Breast Cancer Study Group Trials VIII and IX. J Clin Oncol 2013; 31(25): 3083-3090.
4. Benveniste AP, Dryden MJ, Bedrosian I et al...Surveillance of women with a personal history of breast cancer by tumour subtype. Clin Radiol. 2017 Mar;72(3):266.e1-266.e6.
5. Chu AJ, Chang JM, Cho NK et al.. Imaging Surveillance for Survivors of Breast Cancer: Correlation between Cancer Characteristics and Method of Detection. J Breast Cancer. 2017 Jun;20(2):192-197.