

# Diagnostik und Therapie primärer und metastasierter Mammakarzinome

## Duktales Carcinoma in situ (DCIS)

## Duktales Carcinoma in situ (DCIS)

- **Versionen 2002–2017:**  
 Audretsch / Blohmer / Brunnert / Budach / Costa /  
 Fersis / Friedrich / Gerber / Hanf / Junkermann / Kühn /  
 Lux / Maass / Möbus / Nitz / Oberhoff / Scharl /  
 Solomayer / Souchon / Thill / Thomssen
- **Version 2018:**  
 Blohmer / Mundhenke / Wenz

### Mammographie

#### Vergrößerungsaufnahmen von Mikroverkalkungen

#### Steigerung der Detektionsrate von G1/G2 DCIS durch digitale Mammographie (versus konventionell)

1. D’Orsi C: (2010) “Imaging for the Diagnosis and Management of Ductal Carcinoma In Situ” J Natl Cancer Inst Monogr (41) 214 – 217
2. Allegra CJ, Alberle DR, Ganschow P et al. National Institutes of Health State-of-the-Science Conference Statement: Diagnosis and Management of Ductal Carcinoma in Situ September 22-24,2009. JNCI 2009;102:161-169
3. Allen L, Lago\_Toro C, Hughes JH et al. Is there a role for preoperative assessment of patients with DCIS? Ann Surg 2010; 17: 2395-2400
4. Farshid G, Sullivan T, Downey P et al. Independent predictors of breast malignancy in screen-detected microcalcifications: biopsy results in 2545 cases. Br J Cancer 2011; 105: 1669 – 1675
5. Hayward L, Oeppen RS, Grima AV, et al. The influence of clinicopathological features on the predictive accuracy of conventional breast imaging in determining the extent of screen-detected high-grade pure ductal carcinoma in situ. Ann R Coll Surg Engl 2011; 93:385-390
6. Lee RJ, Vallow LA, McLaughlin SA, Tzou KS, Hines SL, Peterson J et al. . Ductal carcinoma in situ of the breast. Int J Surg Oncol. 2012;2012:123549. doi:10.1155/2012/123549. Epub 2012 Jul 18.

7. Nederend J, Duijm LE, Louwman MW, et al. Impact of transition from analog screening mammography to digital screening mammography on screening outcome in The Netherlands: a population-based study. *Ann Oncol*. 2012 Dec;23(12):3098-103. doi: 10.1093/annonc/mds146. Epub 2012 Jun 27.
8. Badruddoja M. Ductal carcinoma in situ of the breast: a surgical perspective. *Int J Surg Oncol*. 2012;2012:761364. doi: 10.1155/2012/761364. Epub 2012 Sep 4.
9. Lynge E, Ponti A, James T, et al. ICSN DCIS Working group. Variation in detection of ductal carcinoma in situ during screening mammography: A survey within the International Cancer Screening Network. *Eur J Cancer*. 2014 Jan;50(1):185-92. doi: 10.1016/j.ejca.2013.08.013. Epub 2013 Sep 13.

#### Stereotaktische Stanzbiopsie / Vakuumbiopsie (VAB)

1. Houssami, N, D Ambrogetti et al. Accuracy of a Preoperative Model for Predicting Invasive Breast Cancer in Women with Ductal Carcinoma-in-situ on Vacuum-Assisted Core Needle Biopsy. *Ann Oncol* 2011;18(5):1364-71

#### Präparateradiographie

Setzen eines Markierungsclips in der Biopsieregion, wenn die Läsion komplett entfernt wurde

#### MRT zur Festlegung der Ausdehnung

1. Kim do, Y., W. K. Moon, et al. (2007). "MRI of the breast for the detection and assessment of the size of ductal carcinoma in situ." *Korean J Radiol* 8(1): 32-39.
2. Marcotte-Bloch, C., C. Balu-Maestro, et al. (2009). "MRI for the size assessment of pure ductal carcinoma in situ (DCIS): A prospective study of 33 patients." *Eur J Radiol*.
3. Neira, P., B. Aguirre, et al. (2009). "[Breast MRI--histologic correlation for ductal carcinoma in situ]." *Radiologia* 51(4): 396-402.
4. Onesti, J. K., B. E. Mangus, et al. (2008). "Breast cancer tumor size: correlation between magnetic resonance imaging and pathology measurements." *Am J Surg* 196(6): 844-848; discussion 849-850.
5. Schouten van der Velden, A. P., C. Boetes, et al. (2009). "Magnetic resonance imaging in size assessment of invasive breast carcinoma with an extensive intraductal component." *BMC Med Imaging* 9: 5.
6. Schouten van der Velden, A. P., M. S. Schlooz-Vries, et al. (2009). "Magnetic resonance imaging of ductal carcinoma in situ: what is its clinical application? A review." *Am J Surg* 198(2): 262-269.
7. Vag, T., P. A. Baltzer, et al. (2008). "Diagnosis of ductal carcinoma in situ using contrast-enhanced magnetic resonance mammography compared with conventional mammography." *Clin Imaging* 32(6): 438-442.
8. Vanderwalde LH, Dang CM, Bresee C et al. Discordance between pathologic and radiologic tumor size on breast MRI may contribute to increased re-excision rates.


Am Surg 2011; 77(10):1361-3.

9. Itakura K, Lessing J, Sakata T, et al. The Impact of Preoperative Magnetic Resonance Imaging on Surgical Treatment and Outcomes for Ductal carcinoma In Situ. Clin Breast Cancer 2011; 11: 33-38.
10. Mossa-Basha M, Fundaro GM, Shah BA, et al. Ductal carcinoma in Situ of the Breast: MR Imaging Findings with Histopathologica Correlation. RadioGraphics 2010; 30: 1673-1687
11. Warner E, Causer PA, Wong J, et al. Improvement in DCIS Detection Rates by MRI over Time in a High Risk Breast Screening Study. The Breast Journal 2011; 17: 9-17
12. Liu H, Peng W. MRI morphological classification of ductal carcinoma in situ correlating with different biological behavior. Eur J Radiol. 2012 Feb;81(2):214-7
13. Stehouwer BL, Merckel LG, Verkooijen HM, et al. 3-T breast magnetic resonance imaging in patients with suspicious microcalcifications on mammography. Eur Radiol. 2013 Sep 29. [Epub ahead of print]
14. Miyashita M, Amano G, Ishida T, et al. The clinical significance of breast MRI in the management of ductal carcinoma in situ diagnosed on needle biopsy. Jpn J Clin Oncol. 2013 Jun;43(6):654-63.
15. Pilewskie M, Kennedy C, Shappell C, et al. Effect of MRI on the management of ductal carcinoma in situ of the breast. Ann Surg Oncol. 2013 May;20(5):1522-9. doi: 10.1245/s10434-012-2771-y. Epub 2012 Dec 7.
16. Baur A, Bahrs SD, Speck S, et al. Breast MRI of pure ductal carcinoma in situ: sensitivity of diagnosis and influence of lesion characteristics. Eur J Radiol. 2013 Oct;82(10):1731-7.
17. A. Fancellu et al: Meta-analysis of the effect of preoperative breast MRI on the surgical management of ductal carcinoma in situ BJS 2015; 102:883-893
18. E.L. Voss et al: Benefits of preoperative MRI in breast cancer surgery studied in a large population-based cancer registry. BJS 2015; 102; 1649-1657.

Klinische Untersuchung

Feinnadelpunktion / duktale Lavage

Interdisziplinäre Tumorboard-Präsentation



# Prätherapeutische Abklärung suspekter Läsionen (BIRADS 4)

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	Oxford		
	LoE	GR	AGO
■ <b>Mammographie</b>	<b>1b</b>	<b>B</b>	<b>++</b>
■ Vergrößerungsaufnahmen von Mikroverkalkungen	4	C	++
■ Steigerung der Detektionsrate von G1/G2 DCIS durch digitale Mammographie (versus konventionell)	2b	B	+
■ <b>Stereotaktische Stanzbiopsie / Vakuumbiopsie (VAB)</b>	<b>2b</b>	<b>B</b>	<b>++</b>
■ Präparateradiographie	2b	B	++
■ Setzen eines Markierungsclips in der Biopsieregion, wenn die Läsion komplett entfernt wurde	5	D	++
■ <b>MRT zur Festlegung der Ausdehnung</b>	<b>1b</b>	<b>B</b>	<b>+/-</b>
■ <b>Klinische Untersuchung</b>	<b>5</b>	<b>D</b>	<b>++</b>
■ <b>Feinnadelpunktion / duktale Lavage</b>	<b>5</b>	<b>D</b>	<b>-</b>
■ <b>Interdisziplinäre Tumorboard-Präsentation</b>	<b>5</b>	<b>D</b>	<b>++</b>

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### Präoperatives MRT hat keinen Einfluss auf die LRR und das OS

1. 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;123(8):1324-1332.
2. Ryan R, Tawfik O, Jensen RA et al. . Current Approaches to Diagnosis and Treatment of Ductal Carcinoma In Situ and Future Directions. Prog Mol Biol Transl Sci. 2017;151:33-80.

## MRT und DCIS

### Systematic review

### Meta-analysis of the effect of preoperative breast MRI on the surgical management of ductal carcinoma *in situ*

A. Fancellu<sup>1</sup>, R. M. Turner<sup>2</sup>, J. M. Dixon<sup>4</sup>, A. Pinna<sup>1</sup>, P. Cottu<sup>1</sup> and N. Houssami<sup>3</sup>

<sup>1</sup>Department of Clinical and Experimental Medicine, Unit of General Surgery 2, Clinica Chirurgica, University of Sassari, Sassari, Italy, <sup>2</sup>School of Public Health and Community Medicine, The University of New South Wales, and <sup>3</sup>Screening and Test Evaluation Programme, School of Public Health, Sydney Medical School, University of Sydney, Sydney, New South Wales, Australia and <sup>4</sup>Breakthrough Breast Cancer Research Unit, Institute of Genetics and Molecular Medicine, University of Edinburgh, Edinburgh, UK

Correspondence to: Dr A. Fancellu, Department of Clinical and Experimental Medicine, Unit of General Surgery 2, Clinica Chirurgica, University of Sassari, Viale San Pietro 43, 07100 Sassari, Italy (e-mail: afancel@uniss.it)

*BJS* 2015; **102**: 883–893


## MRI und DCIS

- **9 Studien für diese Metaanalyse (7 Kohorten und 2 randomisierte Studien), die MRI im Rahmen der präoperativen Abklärung verwendet haben.**
- **4 Studien hatten sowohl DCIS als invasives Ca.**
- **In 4 Studien war BEO vorgesehen.**

## MRI und DCIS

The present meta-analysis shows that preoperative MRI in women with DCIS is not associated with an improvement in surgical outcomes. MRI increases the initial rate of mastectomy, although the overall mastectomy rate is not significantly increased as a result of MRI. Importantly, this meta-analysis shows that preoperative MRI does not reduce the odds of having negative margins after BCS, nor does it reduce the odds of patients requiring reoperation for positive margins. On the basis of the collective evidence summarized in this meta-analysis, preoperative MRI does not improve the surgical treatment of women with DCIS of the breast.





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**Original Investigation**

## Breast Cancer Mortality After a Diagnosis of Ductal Carcinoma In Situ


Steven A. Narod, MD, FRCPC; Javaid Iqbal, MD; Vasily Giannakeas, MPH; Victoria Sopik, MSc; Ping Sun, PhD

- **108.196 Patientinnen aus der SEER data base**
- **Retrospektive Analyse**
- **Brustkrebspezifische Mortalität 3,3 %**
- **Erhöht bei jungen Frauen und schwarzer Rasse**
- **Patientinnen mit invasiven Rezidiven haben eine ungünstigere Prognose quoad vitam  
HR 18 (95%CI, 14,0-23,6)**
- **Die Reduktion von invasiven Rezidiven durch Radiotherapie verbessert nicht das Überleben nach 10 Jahren**

1. Steven A. Narod, MD, FRCPC; Javaid Iqbal, MD; Vasily Giannakeas, MPH; Victoria Sopik, MSc; Ping Sun, PhD; JAMA Oncol. doi:10.1001/jamaoncol.2015.2510  
Published online August 20, 2015.



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## Original Investigation

# Breast Cancer Mortality After a Diagnosis of Ductal Carcinoma In Situ

Steven A. Narod, MD, FRCPC; Javaid Iqbal, MD; Vasily Giannakeas, MPH; Victoria Sopik, MSc; Ping Sun, PhD

Treatment	Cases, No	10-Year BCS Mortality (95%CI), %	Univariate HR (95% CI)	P Value	Multivariate <sup>3</sup> HR (95%)	P Value
Lumpectomy						
Without radiotherapy	19762	0.9 (0.7 - 1.1)	1 [Reference]		1 [Reference]	
With radiotherapy	42250	0.8 (0.7 – 1.0)	0.86 (0.67 – 1.10)	0.22	0.81 (0.63 – 1.04)	0.10
all	63319	0.8 (0.7 – 1.0)	1 [Reference]		1 [Reference]	
Unilateral mastectomy	19515	1.3 (1.1 – 1.5)	1.45 (1.18 – 1.79)	< 0.001	1.20 (0.96 – 1.50)	0.11

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1. Steven A. Narod, MD, FRCPC; Javaid Iqbal, MD; Vasily Giannakeas, MPH; Victoria Sopik, MSc; Ping Sun, PhD; JAMA Oncol. doi:10.1001/jamaoncol.2015.2510  
Published online August 20, 2015.

ORIGINAL ARTICLE – BREAST ONCOLOGY

# Decreasing Recurrence Rates for Ductal Carcinoma In Situ: Analysis of 2996 Women Treated with Breast-Conserving Surgery Over 30 Years

Preeti Subhedar, MD<sup>1</sup>, Cristina Olcese, BS<sup>1</sup>, Sujata Patil, PhD<sup>2</sup>, Monica Morrow, MD, FACS<sup>1</sup>, and Kimberly J. Van Zee, MS, MD, FACS<sup>1</sup>

## Breast Conserving Surgery Alone

Recurrence rate (95 % confidence interval)

Time period	5 year	10 year	HR	P value
1978-1998	19.1 % (15.6 - 23.2 %)	26% (22.0 - 30.7%)	1.0	----
1999-2010	8.9 % (7.1 - 11.3 %)	19% (14.9 – 23.1%)	0.59	0.0002

## Breast Conserving Surgery and Radiotherapy

Recurrence rate (95 % confidence interval)

Time period	5 year	10 year	HR	P value
1978-1998	6.4% (4.1- 9.8 %)	13% (9.3 - 17.1 %)	1.0	----
1999-2010	4.9% (3.7 – 6.5 %)	11% (8.7- 14.2 %)	0.84	0.04

1. Preeti Subhedar, MD<sup>1</sup>, Cristina Olcese, BS<sup>1</sup>, Sujata Patil, PhD<sup>2</sup>, Monica Morrow, MD, FACS<sup>1</sup>, and Kimberly J. Van Zee, MS, MD, FACS<sup>1</sup>; Ann Surg Oncol (2015) 22:3273–3281

## Generelle therapeutische Prinzipien

**Exzision (BEO, Mastektomie) ist die therapeutische Basis für die Behandlung des DCIS.**

**Die adjuvante Therapie (Strahlentherapie, endokrine Therapie) muss mit der Patientin auf der Basis einer Risiko-Nutzen-Bewertung individuell erörtert werden.**

1. Kirsty E. Stuart, Nehmat Houssami, Richard Taylor, et al. Long-term outcomes of ductal carcinoma in situ of the breast: a systematic review, meta-analysis and meta-regression analysis. BMC Cancer (2015) 15:890.
2. Katrina B. Mitchell and Henry Kuerer. Ductal Carcinoma In Situ: Treatment Update and Current Trends. Curr Oncol Rep (2015) 17: 48
3. Elizabeth M. Ward, Carol E. DeSantis, Chun Chieh Lin, et al. Cancer Statistics: Breast Cancer In Situ. CA Cancer J Clin 2015;65:481–495.
4. Benjamin D. Smith. When Is Good Enough Really Good Enough? Defining the Role of Radiation in Low-Risk Ductal Carcinoma In Situ. J Clin Oncol 2015; 33(7): 686 – 692.
5. Laura Esserman, Christina Yau. Rethinking the Standard for Ductal Carcinoma In Situ Treatment. JAMA Oncology Published online August 20, 2015.
6. Steven A. Narod, Javaid Iqbal, Vasily Giannakeas, et al. Breast Cancer Mortality After a Diagnosis of Ductal Carcinoma In Situ. JAMA Oncol. doi:10.1001/jamaoncol.2015.2510 Published online August 20, 2015.



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# Operative Maßnahmen zur Therapie des histologisch gesicherten DCIS I

	Oxford		
	LoE	GR	AGO
■ Exzision (drahtmarkiert)	2b	B	++
■ Flankierende Drahtmarkierung bei großen Läsionen	5	D	+
■ Präparatradiographie bei Drahtmarkierung	2b	B	++
■ Intraoperative Sonographie (darstellbarer Befund)	3a	C	+/-
■ Sofortige Nachresektion bei knappen Resektionsrändern (Präparateradiographie)	1c	B	++
■ Intraoperative Schnellschnittdiagnostik (Einzelfall für Schnittränder)	3a	D	+/-
■ Interdisziplinäre Tumorboard-Präsentation	2b	C	++

Offene Biopsien suspekter Läsionen (mammographische Mikrokalzifikationen, suspekter US, MRI etc.) ohne präoperative Stanzbiopsie sollten vermieden werden.

Exzision (drahtmarkiert)

1. Houssami N, Ambrogetti D, Marinovich L et al. Accuracy of a preoperative model for predicting invasive breast cancer in women with ductal carcinoma in situ on vacuum assisted core needle biopsy. Ann Surg Oncol 2011;18(5):1364-71
2. Saadai P, Moezzi M et al. Preoperative and intraoperative predictors of positive margins after breast-conserving surgery: a retrospective review. Breast Cancer 2011; 18: 221-225
3. Kumar S, Sacchini V. The Surgical Management of Ductal Carcinoma In Situ. The Breast Journal 2010; 16: S 49-S52
4. Hwang ES. The Impact of Surgery on Ductal Carcinoma In Situ Outcomes: The Use of Mastectomy. J Natl Cancer Inst Monogr 2010; 41: 197-199.
5. Ryan R, Tawfik O, Jensen RA, et al. Current Approaches to Diagnosis and Treatment of Ductal Carcinoma In Situ and Future Directions. Prog Mol Biol Transl Sci. 2017;151:33-80.

Flankierende Drahtmarkierung bei großen Läsionen

Präparatradiographie

1. Kuerer HM, Smith BD, Chavez-MacGregor M, et al. DCIS Margins and Breast Conservation: MD Anderson Cancer Center Multidisciplinary Practice Guidelines and Outcomes. J Cancer. 2017;8(14):2653-2662.

Ohne Einfluss auf NRR

1. DVerstehenden DPA, Keizer LGG, Schlooz-Vries MS, Duijm LEM, Wauters CAP, Strebe LJA: Performance characteristics of specimen radiography for margin assessment for ductal carcinoma in situ: a systematic review. Breast Cancer Res Treat 2017;166:669–679.

*„A literature search was conducted for diagnostic studies up to April 2017 concerning SR for intra-operative margin assessment of breast lesions with pure DCIS or with DCIS components. Studies reporting sensitivity and specificity calculated using final pathology report as reference test were included. Due to improved imaging technology, studies published more than 15 years ago were excluded. Methodological quality was assessed using quality assessment of diagnostic accuracy studies-2 checklist. Due to clinical and methodological diversity, meta-analysis was considered not useful.*

*Results Of 235 citations identified, 9 met predefined inclusion criteria and documented diagnostic efficacy data. Sensitivity ranged from 22 to 77% and specificity ranged from 51 to 100%. Positive predictive value and negative predictive value ranged from 53 to 100% and 32 to 95%, respectively. High or unclear risk of bias was found in reference standard in 5 of 9 studies. High concerns regarding applicability of index test were found in 6 of 9 studies.*

*Conclusions The present results do not support the routine use of intra-operative specimen radiography to reduce the rate of positive margins in patients undergoing breast-conserving surgery for pure DCIS or the DCIS component in invasive cancer. Future studies need to differentiate between initial and final specimen margin involvement. This could provide surgeons with a number needed to treat for a more applicable outcome.“*

#### Intraoperative Sonographie (darstellbarer Befund)

1. **Ahmed M, Douek M. Intra-operative ultrasound versus wire-guided localization in the surgical management of non-palpable breast cancers: systematic review and meta-analysis. Breast Cancer Res Treat. 2013; 140(3): 435-446.**

#### Sofortige Nachresektion bei knappen Resektionsrändern (Präparateradiographie)

1. Thill M, Röder K, Diedrich K et al. Intraoperative assessment of surgical margins during breast conserving surgery of ductal carcinoma in situ by use of radiofrequency spectroscopy. The Breast 2011(11) 579-580
2. Guidroz JA, Larrieux G, Liao J et al. Sampling of secondary margins decreases the need for re-excision after partial mastectomy Surgery. 2011; 150: 802 – 809
3. Fisher CS, Klimberg S, Khan S, et al. Margin Index is not a reliable tool for predicting residual disease after breast-conserving surgery for DCIS. Ann Surg

Oncol 2011; 18: 3155-3159

4. Kumar S, Sacchini V. the Surgical Management of Ductal Carcinoma In Situ. The Breast Journal 2010; 16: S49 – S52
5. Kennedy S, Geradts J, Bydlon T, et al. Optical breast cancer margin assessment: an observational study of the effects of tissue heterogeneity on optical contrast. Breast Cancer Res 2010
6. Javid SH, Anderson BO. Tailored Strategies for DCIS Management. Oncology 2011; 25 (9):861-3
7. Kulkarni S. Management of DCIS: A Work in Progress. Oncology 2011; 25 (9): 852-6
8. Thill M, Dittmer C, Baumann K, et al. MarginProbe®--final results of the German post-market study in breast conserving surgery of ductal carcinoma in situ. Breast. 2014 Feb;23(1):94-6. doi: 10.1016/j.breast.2013.11.002. Epub 2013 Dec 2.
9. Kuerer HM, Smith BD, Chavez-MacGregor M, et al. DCIS Margins and Breast Conservation: MD Anderson Cancer Center Multidisciplinary Practice Guidelines and Outcomes. J Cancer. 2017;8(14):2653-2662.

#### Intraoperative Schnellschnittdiagnostik

1. Kuerer HM, Smith BD, Chavez-MacGregor M, Albarracin C, Barcenas CH, Santiago L, Edgerton ME, Rauch GM, Giordano SH, Sahin A, Krishnamurthy S, Woodward W, Tripathy D, Yang WT, Hunt KK. DCIS Margins and Breast Conservation: MD Anderson Cancer Center Multidisciplinary Practice Guidelines and Outcomes. J Cancer. 2017;8(14):2653-2662.

#### Interdisziplinäre Tumorboard-Präsentation



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# Operative Maßnahmen zur Therapie des histologisch gesicherten DCIS II

	Oxford LoE	GR	AGO
■ <b>Histologisch freie Resektionsränder (pR0)</b>	1a	A	++
■ <b>Multifokalität: BEO falls möglich (inkl. RT)</b>	2b	B	+
■ <b>Nachresektion bei knappem Resektionsrand (&lt; 2 mm im Paraffinschnitt)**</b>	2b	C	+
■ <b>Mastektomie* (große Läsionen; keine sicheren Ränder im Nachresektat)</b>	2a	B	++
■ <b>SNE*</b>			
■ Mastektomie	3b	B	+
■ BET	3b	B	-
■ DCIS beim Mann	5	D	+/-
■ <b>Axilladissektion</b>	2b	B	--

\* Patientinnen mit einem tastbaren Tumor haben signifikant höhere Wahrscheinlichkeiten für eine okkulte Invasion (26%), Multizentrität und ein Lokalrezidiv.

\*\*besonders, wenn nicht nachbestrahlt wird

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### Histologisch freie Resektionsränder (pR0)

1. Lagios MD, Page DL, Silverstein MJ. Prospective study of wide excision alone for ductal carcinoma in situ of the breast. J Clin Oncol 2006;24:3809-11
2. MacAusland SG, Hepel JT, Chong FK, et al. An attempt to independently verify the utility of the Van Nuys Prognostic Index for ductal carcinoma in situ. Cancer 2007;110:2648-53
3. Macdonald HR, Silverstein MJ, Lee LA, et al. Margin width as the sole determinant of local recurrence after breast conservation in patients with ductal carcinoma in situ of the breast. Am J Surg 2006 192:420-2
4. Meijnen P, Oldenburg HS, Peterse JL, et al. Clinical outcome after selective treatment of patients diagnosed with ductal carcinoma in situ of the breast. Ann Surg Oncol 2007 Nov 7; [Epub ahead of print]
5. Lee RJ, Vallow LA, McLaughlin SA, et al. Ductal carcinoma in situ of the breast. Int J Surg Oncol. 2012;2012:123549. doi: 10.1155/2012/123549. Epub 2012 Jul 18.
6. Badruddoja M. Ductal carcinoma in situ of the breast: a surgical perspective. Int J Surg Oncol. 2012;2012:761364. doi: 10.1155/2012/761364. Epub 2012 Sep 4.
7. Hassani A, Griffith C, Harvey J. Size does matter: High volume breast surgeons accept smaller excision margins for wide local excision--a national survey of the surgical management of wide local excision margins in UK breast cancer patients. Breast. 2013 Oct;22(5):718-22.
8. Morrow M., et al: Society of Surgical Oncology –American Society for Radiation



Multifokalität: BET falls möglich (inkl. RT)

1. Meijnen P, Bartelink H. Multifocal ductal carcinoma in situ of the breast: A contraindication for breast-conserving treatment? J Clin Oncol 2007;25:5548–5549
2. Rakovitch E, Pignol JP, Hanna W, et al. Significance of multifocality in ductal carcinoma in situ: outcomes of women treated with breast-conserving therapy. J Clin Oncol 2007;25:5591–5596

Nachresektion bei knappem Resektionsrand (< 2 mm im Paraffinschnitt)

1. Dunne, C., J. P. Burke, et al. (2009). "Effect of margin status on local recurrence after breast conservation and radiation therapy for ductal carcinoma in situ." J Clin Oncol 27(10): 1615-1620.
2. Van Cleef A, Altintas S, Huizing M et al. Current view on ductal carcinoma in situ and importance of the margin thresholds: A review. Facts Views Vis Obgyn. 2014;6(4):210-8.

\*\*besonders wenn nicht nachbestrahlt wird

3. Kuerer HM, Smith BD, Chavez-MacGregor M, Albarracin C, Barcnas CH, Santiago L, Edgerton ME, Rauch GM, Giordano SH, Sahin A, Krishnamurthy S, Woodward W, Tripathy D, Yang WT, Hunt KK. DCIS Margins and Breast Conservation: MD Anderson Cancer Center Multidisciplinary Practice Guidelines and Outcomes. J Cancer. 2017;8(14):2653-2662.
4. Morrow M. De-escalating and escalating surgery in the management of early breast cancer. Breast. 2017 Aug;34 Suppl 1:S1-S4.

*„The panelists emphasized that clinical judgment is necessary to determine whether patients with negative margin widths less than 2 mm require re-excision based on the long-term rates of local control seen in National Surgical Adjuvant Breast and Bowel Project (NSABP) trials, which used the negative margin definition of no ink on tumor [10] and on the results of the large single-institution study of Van Zee et al. [11] in which negative margin width was not a predictor of local recurrence in patients receiving radiotherapy after controlling for multiple clinical variables of interest. In the study of Van Zee et al., crude rates of local recurrence among the 2996 patients receiving radiotherapy were 10% for those with negative margins 2 mm or less in size, 7% for those with margins >2 mm, and 9% for margins >10 mm. Examples of factors to consider when deciding whether to re-excite a negative margin <2 mm include the extent of DCIS in proximity to the margin, which margin is close, the presence of residual calcifications on mammogram, the cosmetic impact of re-excision, and the patient's life*

*expectancy.“*

#### Mastektomie\* (große Läsionen; keine sicheren Ränder im Nachresektat)

1. Ringberg A, Nordgren H, Thorstensson S, et al. Histopathological risk factors for ipsilateral breast events after breast conserving treatment for ductal carcinoma in situ of the breast--results from the Swedish randomised trial. Eur J Cancer 2007;43:291-8
2. NCCN and National Comprehensive Cancer Network. Clinical Practice Guidelines in Oncology: Breast Cancer - Version V.1.2007.
3. Solin LJ. Is excision alone adequate treatment for low-risk ductal carcinoma-in-situ of the breast? J Clin Oncol 2006;24:1017-1019
4. Vargas C, Kestin L, Go N, et al. Factors associated with local recurrence and cause-specific survival in patients with ductal carcinoma in situ of the breast treated with breast-conserving therapy or mastectomy. Int J Radiat Oncol Biol Phys 2005;63:1514-21
5. Carlson, G. W., A. Page, et al. (2007). "Local recurrence of ductal carcinoma in situ after skin-sparing mastectomy." J Am Coll Surg 204(5): 1074-1078; discussion 1078-1080.
6. Rudloff U, E Brogi et al. (2010): "The Influence of Margin Width and Volume of Disease Near Margin on Benefit of Radiation Therapy for Women With DCIS Treated With Breast-Conserving Therapy" Ann Surg (251) 583 – 591
7. Polyak K. Molecular markers for the diagnosis and management of ductal carcinoma in situ. J Natl Cancer Inst Monogr 2010; 41: 210-213
8. Houssami N, Ambrogetti D, Marinovich L et al. Accuracy of a preoperative model for predicting invasive breast cancer in women with ductal carcinoma in situ on vacuum assisted core needle biopsy. Ann Surg Oncol 2011;18(5):1364-71

#### SNE\*

##### Mastektomie

##### DCIS beim Mann

1. Chern J, Liao L, Baraldi R, et al. Case report: ductal carcinoma in situ in the male breast. Case Rep Radiol. 2012;2012:532527. doi: 10.1155/2012/532527. Epub 2012 Sep 26.

#### BET

1. Meijnen P, Oldenburg HS, Loo CE, et al. Risk of invasion and axillary lymph node metastasis in ductal carcinoma in situ diagnosed by core-needle biopsy. Br J Surg 2007;94:952-6
2. Miyake T, Shimazu K, Ohashi H, et al. Indication for sentinel lymph node biopsy for breast cancer when core biopsy shows ductal carcinoma in situ. The American

Journal of Surgery 2011; 202: 59-65 :394095. doi: 10.5402/2012/394095. Epub  
2012 May 14.

### Axilladissektion

## Prognostische Faktoren für das Auftreten eines ipsilateralen Rezidivs

	Oxford		
	LoE	GR	AGO
▪ Resektionsränder	1a	A	++
▪ Residualer tumorassoziierter Mikrokalk	2b	C	++
▪ Alter	1a	A	++
▪ Größe	1a	A	++
▪ Grading	1a	A	++
▪ Komedonekrose	1a	A	++
▪ Architektur	2b	C	+
▪ Diagnostische Methode	1a	A	++
▪ Fokalität	1a	A	++
▪ (mod.) Van Nuys Prognose Index	2b	C	+/-
▪ Palpables DCIS	2b	C	+/-
▪ Palpabel + COX-2+p16+Ki-67+	2b	C	+/-
▪ Palpabel + ER-, HER2, +Ki-67+	2b	C	+/-
▪ HER2-Überexpression	1a	B	+/-
▪ ER/PgR (positiv vs. negativ)	1a	B	+/-
▪ DCIS-Score	2b	C	+/-
▪ MSKCC Nomogram	2b	C	+/-
▪ DCIS mit Mikroinvasion – Behandlung analog zum invasiven Karzinom empfohlen	3b	C	++
▪ Intrinsische Subgruppen (Luminal A,B, HER+, triple negativ)	2b	C	-

### Resektionsränder

### Residualer tumorassoziierter Mikrokalk

### Alter

### Größe

### Grading

### Komedonekrose

### Architektur

1. Ringberg A, Nordgren H, Thorstensson S, et al. Histopathological risk factors for ipsilateral breast events after breast conserving treatment for ductal carcinoma in situ of the breast--results from the Swedish randomised trial. Eur J Cancer 2007;43:291-8
2. NCCN and National Comprehensive Cancer Network. Clinical Practice Guidelines in Oncology: Breast Cancer - Version V.1.2007.
3. Vargas C, Kestin L, Go N, et al. Factors associated with local recurrence and cause-specific survival in patients with ductal carcinoma in situ of the breast treated with breast-conserving therapy or mastectomy. Int J Radiat Oncol Biol Phys 2005;63:1514-21
4. Farhat G, R Walker et al. (2010): "Changes in Invasive Breast Cancer and Ductal Carcinoma In Situ Rates in Relation to the Decline in Hormone Therapy Use" J Clin Oncol (28)

5. Pinder SE, C Duggan et al. A new pathological system for grading DCIS with improved prediction of local recurrence: results from the UKCCCR/ANZ DCIS trial. *Br J Cancer* 2010; 103: 94 – 100
6. Kerlikowske K, AM Molinaro et al. Biomarker Expression and Risk of Subsequent Tumors After Initial Ductal Carcinoma In Situ Diagnosis. *J Natl Cancer Inst* 2010; 102: 627 – 637
7. Rudloff U, LM Jacks et al. Normogram for Predicting the Risk of Local Recurrence After Breast-Conserving Surgery for Ductal Carcinoma In Situ. *J Clin Oncol* 2010; 28: 3762 – 3769
8. Cuzick J, I Sestak et al. Effect of Tamoxifen and radiotherapy in women with locally excised ductal carcinoma in situ: long-term results from the UK / ANZ DCIS trial. *Lancet Oncol* 2011; 12: 21- 29
9. Lari S, Kuerer HM. Review: Biological Markers in DCIS and Risk of Breast Recurrence: A Systematic Review. *Journal of Cancer* 2011; 2: 232-261
10. Harada S, Mick R, Roses R, et al. The significance of HER-2/neu Receptor positivity and Immunophenotype in Ductal Carcinoma In Situ with Early Invasive Disease. *J Surg Oncol* 2011; 104: 458-465
11. Han K, Nofech-Mozes S, Narod S, et al. Expression of Her2neu in Ductal Carcinoma in situ is associated with Local Recurrence. *Clinical Oncology* 2011; 1-7 (epub ahead)
12. King TA, Sakr RA, Muhsen S, et al. Is there a Low-Grade Precursor Pathway in Breast Cancer? *Ann Surg Oncol* 2011;(epub ahead)
13. Chan P, Lim S. Predictors of Invasive Breast Cancer in Ductal Carcinoma In Situ initially diagnosed by Core Biopsy. *Asian J Surg* 2010; 33: 76-82
14. Liao N, Zhang GC, Liu YH, et al. HER2-positive status is an independent predictor for coexisting invasion of ductal carcinoma in situ of the breast presenting extensive DCIS component. *Pathology Res Practice* 2011; 207: 1-7
15. Dick AW, Sorbero MS, Ahrendt GM, et al. Comparative Effectiveness of Ductal Carcinoma In Situ Management and the Roles of margins and Surgeons. *J natl Cancer Inst* 2011; 103:92-104
16. Brennan ME, Turner RM, Ciatto S, et al. Ductal Carcinoma in Situ at Core-Needle Biopsy: Meta-Analysis of Underestimation and Predictors of Invasive Breast Cancer. *Radiology* 2011; 260: 119-128
17. Wang S, Shamliyan T, Virnig BA, et al. Tumor characteristics as predictors of local recurrence after treatment of ductal carcinoma in situ: a meta-analysis. *Breast Cancer Res Treat* 2011; 127: 1-14
18. Holmes P, Lloyd J, Chervoneva I, et al. Prognostic Markers and Long-Term Outcomes in Ductal Carcinoma In Situ of the Breast Treated With Excision Alone. *Cancer* 2011; 117: 3650-7

#### Diagnostische Methode

1. Han JS, Molberg KH, Sarode V. Predictors of Invasion and Axillary Lymph Node Metastasis in Patients with a Core Biopsy Diagnosis of Ductal carcinoma In Situ: An Analysis of 255 Cases. *The Breast Journal* 2011; 17: 223-229
2. Barbalaco Neto G, Rossetti C, Fonseca FL, et al. Ductal carcinoma in situ in core needlebiopsies and its association with extensive in situ component in the surgical specimen. *Int Arch Med.* 2012 Jun 20;5(1):19.
3. Park HS, Kim HY, Park S et al. A nomogram for predicting underestimation of invasiveness in ductal carcinoma in situ diagnosed by preoperative needle biopsy. *Breast.* 2013 Oct;22(5):869-73.
4. Park HS, Park S, Cho J, et al. Risk predictors of underestimation and the need for sentinel node biopsy in patients diagnosed with ductal carcinoma in situ by preoperative needle biopsy. *J Surg Oncol.* 2013 Mar;107(4):388-92. doi: 10.1002/jso.23273. Epub 2012 Sep 24.
5. Schulz S, Sinn P, Golatta M, et al. Prediction of underestimated invasiveness in patients with ductal carcinoma in situ of the breast on percutaneous biopsy as rationale for recommending concurrent sentinel lymph node biopsy. *Breast.* 2013 Aug;22(4):537-42.
6. Elshof LE, Schmidt MK, Rutgers EJ, et al. Cause-specific Mortality in a Population-based Cohort of 9799 Women Treated for Ductal Carcinoma In Situ. *Ann Surg.* 2017 Apr 3. doi: 10.1097/SLA.0000000000002239. [Epub ahead of print]
7. Punglia RS, Jiang W, Lipsitz SR, et al. Clinical risk score to predict likelihood of recurrence after ductal carcinoma in situ treated with breast-conserving surgery. *Breast Cancer Res Treat.* 2017 Oct 28. doi: 10.1007/s10549-017-4553-5. [Epub ahead of print]

#### Fokalität

1. Meijnen P, Bartelink H. Multifocal ductal carcinoma in situ of the breast: A contraindication for breast-conserving treatment? *J Clin Oncol* 2007;25:5548–5549
2. Rakovitch E, Pignol JP, Hanna W, et al. Significance of multifocality in ductal carcinoma in situ: outcomes of women treated with breast-conserving therapy. *J Clin Oncol* 2007;25:5591–5596

#### (mod.) Van Nuys Prognose Index und MSKCC Nomogramm

1. Lagios MD, Page DL, Silverstein MJ. Prospective study of wide excision alone for ductal carcinoma in situ of the breast. *J Clin Oncol* 2006;24:3809-11
2. MacAusland SG, Hepel JT, Chong FK, et al. An attempt to independently verify the utility of the Van Nuys Prognostic Index for ductal carcinoma in situ. *Cancer* 2007;110:2648-53
3. Macdonald HR, Silverstein MJ, Lee LA, et al. Margin width as the sole determinant of local recurrence after breast conservation in patients with ductal carcinoma in situ of the breast. *Am J Surg* 2006 192:420-2

4. Meijnen P, Oldenburg HS, Peterse JL, et al. Clinical outcome after selective treatment of patients diagnosed with ductal carcinoma in situ of the breast. Ann Surg Oncol 2007 Nov 7; [Epub ahead of print]
5. Altintas S, Toussaint J, Durbecq V, et al. Fine Tuning of the Van Nuys Prognostic Index (VNPI) 2003 by Integrating the Genomic Grade Index (GGI): New Tools for Ductal Carcinoma In Situ (DCIS). The Breast Journal 2011; 17: 343-351
6. Fisher CS, Klimberg S, Khan S, et al. margin Index Is Not a Reliable Tool for Predeicting Residual Disease after Breast-Conserving Surgery for DCIS. Ann Surg Oncol (2011); 18: 3155-3159
7. Silverstein MJ, Lagios MD. Choosing Treatment for Patients With Ductal Carcinoma In Situ: Fine Tuning the University of Southern california/Van Nuys Prognostic Index. J natl Cancer Inst Monogr 2010; 41: 193-196
8. Rudloff U, Jacks LM, Goldberg JL, et al. Nomogram for predicting the risk of local recurrence after breast conserving surgery for ductal carcinoma in situ. J Clin Oncol 2010; 28(23): 3762-9
9. Van Zee KJ, Patil S. Validation of a nomogram for predicting risk of local recurrence for ductal carcinoma in situ. J Clin Oncol 2012; 30(25): 3143-4.
10. Sweldens C, Peeters S, van Limbergen E, et al. Local relapse after breast-conserving therapy for ductal carcinoma in situ: a European single-center experience and external validation of the Memorial Sloan-Kettering Cancer Center DCIS nomogram. Cancer J 2014; 20(1): 1-7.

#### Palpables DCIS

Palpabel + COX-2+p16+Ki-67+

Palpabel + ER-, HER2, +Ki-67+

HER2-Überexpression

ER/PgR (positiv vs. negativ)

DCIS-Score

1. Solin LJ, Gray R, Baehner FL, et al. A multigene expression assay to predict local recurrence risk for ductal carcinoma in situ of the breast. J Natl Cancer Inst. 2013 May 15;105(10):701-10.
2. Sarah Patricia Cate, Alyssa Gillego, Manjeet Chadha, et al. Does the Oncotype DCIS score impact treatment decisions? J Clin Oncol 31, 2013 (suppl 26; abstr 91)
3. Rakovitch E, Nofech-Mozes S, Hanna W et al. A large prospectively-designed study of the DCIS score. Predicting recurrence risk after local excision for ductal carcinoma in situ patients with and without irradiation. SABCS 2015. S5-04
4. Wood WC, Alvarado M, Buchholz DJ, et al. The current clinical value of the DCIS Score. Oncology (Williston Park). 2014 May;28 Suppl 2:C2, 1-8, C3.

DCIS mit Mikroinvasion – Behandlung analog zum invasiven Karzinom

1. Meijnen P, Oldenburg HS, Loo CE, et al. Risk of invasion and axillary lymph node metastasis in ductal carcinoma in situ diagnosed by core-needle biopsy. *Br J Surg* 2007;94:952-6
2. Eng-Wong J, JP Costantino et al. The Impact of Systemic Therapy Following Ductal Carcinoma In Situ. *J Natl Cancer Inst Monogr* 2010; 41: 200 – 203
3. Ryan R, Tawfik O, Jensen RA, Anant S. Current Approaches to Diagnosis and Treatment of Ductal Carcinoma In Situ and Future Directions. *Prog Mol Biol Transl Sci.* 2017;151:33-80.


#### Intrinsische Subgruppen (Luminal A,B, HER+, triple negativ)


1. Vidali C, Caffo O, Aristei C, et al. Conservative treatment of breast ductal carcinoma in situ: results of an Italian multi-institutional retrospective study. *Radiat Oncol.* 2012 Oct 25;7(1):177. [Epub ahead of print]
2. Lambert K, Patani N, Mokbel K. Ductal carcinoma in situ: recent advances and future prospects. *Int J Surg Oncol.* 2012;2012:347385. doi: 10.1155/2012/347385. Epub 2012 May 17.
3. Zhou W, Johansson C, Jirström K, et al. A Comparison of Tumor Biology in Primary Ductal Carcinoma In Situ Recurring as Invasive Carcinoma versus a New In Situ. *Int J Breast Cancer.* 2013;2013:582134.
4. Collins LC, Achacoso N, Haque R et al. Risk factors for non-invasive and invasive local recurrence in patients with ductal carcinoma in situ. *Breast Cancer Res Treat.* 2013 Jun;139(2):453-60.
5. Kong Y, Yang L, Tang H, et al. A nation-wide multicenter retrospective study of the epidemiological, pathological and clinical characteristics of breast cancer in situ in Chinese women in 1999 - 2008. *PLoS One.* 2013 Nov 20;8(11):e81055.
6. Noh JM, Lee J, Choi DH, et al. HER-2 overexpression is not associated with increased ipsilateral breast tumor recurrence in DCIS treated with breast-conserving surgery followed by radiotherapy. *Breast.* 2013 Oct;22(5):894-7.



## Strahlentherapie Statements

- **Strahlentherapie hat keinen Einfluss auf das Gesamtüberleben.** **LOE 1a**
- **Strahlentherapie reduziert das ipsilaterale Lokalrezidivrisiko (invasiv und nicht-invasiv) um 50 %.** **LOE 1a**
- **Das Vermeiden eines invasiven Rezidivs ist sehr wahrscheinlich nicht mit einem Überlebensvorteil verbunden.** **LOE 2b**
- **Der absolute individuelle Benefit der Strahlentherapie ist vom individuellen Lokalrezidivrisiko abhängig.**
- **The number needed to treat (für jedes Auftreten eines In-Brust-Rezidivs) ist 9 (über alle Risikogruppen)**





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Guidelines Breast  
Version 2018.1D

# DCIS Strahlentherapie

## Radiotherapie nach:

- Brusterhaltender Operation (BEO)  
(gesamte Brust, WBI)
- Mastektomie

## Sonderformen der Radiotherapie:

- Teilbrustbestrahlung
- Hypofraktionierte Radiotherapie
- Boost-RT des Tumorbettes
  - Bei Patientinnen unter 45-50 Jahren

	Oxford LoE	GR	AGO
1a	A	++	
2b	B	--	
3a	D	--	
2b	D	+/-**	
2b	D	--	
2b	C	+/-	

\* NW und Nachteile der Radiotherapie müssen gegenüber der erreichbaren Risikoreduktion abgewogen werden.  
Ein Verzicht auf eine Strahlentherapie nach BEO bedeutet ein erhöhtes lokales Rezidivrisiko ohne Einfluss auf das Überleben. Dieses gilt auch für Patientinnen mit günstigen prognostischen Faktoren (low-risk-Subgruppe; Level I-Evidenz): < 2,5 cm, low and intermediate nuclear grade, mammographisch entdeckt

\*\* Analyse im Rahmen laufender Studien

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FORSCHEN  
LEHREN  
HEILEN

### Radiotherapie nach: Brusterhaltender Operation (BEO) (gesamte Brust, WBI)

1. Bijker N, Meijnen P, Peterse JL, et al. Breast-conserving treatment with or without radiotherapy in ductal carcinoma-in-situ: ten-year results of European Organisation for Research and Treatment of Cancer randomized phase III trial 10853--a study by the EORTC Breast Cancer Cooperative Group and EORTC Radiotherapy Group. J Clin Oncol 2006;24:3381-7
2. Emdin SO, Granstrand B, Ringberg A, et al. Swedish Breast Cancer Group. SweDCIS. Radiotherapy after sector resection for ductal carcinoma in situ of the breast. Results of a randomised trial in a population offered mammography screening. Acta Oncol 2006;45:536-43
3. Viani GA, Stefano EJ, Afonso SL, et al. Breast-conserving surgery with or without radiotherapy in women with ductal carcinoma in situ: a meta-analysis of randomized trials. Radiat Oncol 2007;2:2
4. Wong JS, SC Lester, Smith BL. Reply Wong to Lagios Wong Letter. J Clin Oncol 2006;24:3811-2
5. Poortmans P. Evidence based radiation oncology: breast cancer. Radiother Oncol 2007;84:84-101
6. Sautter-Bihl ML, Budach W, Dunst J, Feyer P, Haase W, Harms W, Sedlmayer F, Souchon R, Wenz F, Sauer R. DEGRO Practical guidelines for radiotherapy of breast cancer I: Breast-conserving therapy. Strahlenther Onkol 2007;183:661-666
7. Solin LJ. Is excision alone adequate treatment for low-risk ductal carcinoma-in-situ

of the breast? J Clin Oncol 2006;24:1017-1019

8. The Consensus Conference on the treatment of in situ ductal carcinoma of the breast, April 22-25, 1999. Schwartz GF, Solin LJ, Olivotto IA, Ernster VL, Pressman PI.
9. J Clin Oncol. 2009 Oct 20;27(30):4939-47. Epub 2009 Aug 31. Impact of pathological characteristics on local relapse after breast-conserving therapy: a subgroup analysis of the EORTC boost versus no boost trial. Jones HA, Antonini N, Hart AA, Peterse JL, et al.
10. Bijker N, G van Tienhoven (2010): "Local and Systemic Outcomes in DCIS Based on Tumor and Patient Characteristics: The Radiation Oncologist's Perspective" J Natl Cancer Inst Monogr (41) 178 – 180
11. Solin LJ (2010): "The Impact of Adding Radiation Treatment After Breast Conservation Surgery for Ductal Carcinoma In Situ of the Breast" J Natl Cancer Inst Monogr (41) 187 – 192
12. Kane RL, BA Virnig et al. (2010) : "The Impact Surgery, Radiation, and Systemic Treatment on Outcomes in Patients With Ductal Carcinoma In Situ" J Natl Cancer Inst Monogr (41) 130 – 133
13. Hughes LL, Wong M, Page DL et al. Local excision alone without irradiation for ductal carcinoma in situ of the breast: a trial of the Eastern Cooperative Oncology Group. J Clin Oncol 2009; 27(32): 5319-24
14. Jeruss JS, Kuerer HM, Beitsch P et al. Update on DCIS outcomes from the American Society of Breast Surgeons Accelerated Partial Breast Irradiation Registry trial. Ann Surg Oncol. 2011; 18(1): 65-71
15. Wapnir IL, Dignam JJ, Fisher B, et al. Long-Term Outcomes of invasive ipsilateral breast tumor recurrences after lumpectomy in NSABP B-17 and B-24 randomized clinical trials for DCIS. J Natl Cancer Inst 2011; 103: 478-488
16. EBCTCG Correa C et al. Overview of the randomized trials of radiotherapy in ductal carcinoma in situ of the breast. J Natl Cancer Inst Monogr. 2010 (41); 162 – 77
17. Motwani SB, Goyal S, Moran MS et al: Ductal carcinoma In Situ Treated With Breast-Conserving Surgery and Radiotherapy: A Comparison With ECOG Study 5194. Cancer 2011; 117: 1156-62.
18. EBCTCG Correa C et al. Overview of the randomized trials of radiotherapy in ductal carcinoma in situ of the breast. J Natl Cancer Inst Monogr. 2010 (41); 162 – 77
19. Motwani SB, Goyal S, Moran MS et al: Ductal carcinoma In Situ Treated With Breast-Conserving Surgery and Radiotherapy: A Comparison With ECOG Study 5194. Cancer 2011; 117: 1156-62.
20. Childs SK, Chen YH, Duggan MM, et al. Impact of margin status on local recurrence after mastectomy for ductal carcinoma in situ. Int J Radiat Oncol Biol Phys 2012 Sep 10. doi:pii: S0360-3016(12)03334-2. 10.1016/j.ijrobp.2012.07.2377. [Epub ahead of print]

- 21.Cobleigh MA, Anderson SJ, Julian TB, et al. NSABP B-43: A phase III clinical trial to compare trastuzumab (T) given concurrently with radiation therapy (RT) to RT alone for women with HER2+ DCIS resected by lumpectomy (Lx). SABCS 2012; OT1-2-01
- 22.Halaszi LM, Sreedhara M, Chen YH, et al. Improved outcomes of breast-conserving therapy for patients with ductal carcinoma in situ. *Int J Radiat Oncol Biol Phys* 2012;82:e581-6.
- 23.Shaitelman SF, Wilkinson JB, Kestin LL, et al. Long-term outcome in patients with ductal carcinoma in situ treated with breast-conserving therapy: implications for optimal follow-up strategies. *Int J Radiat Oncol Biol Phys* 2012;83:e305-12.
- 24.Vidali C, Caffo O, Aristei C, et al. Conservative treatment of breast ductal carcinoma in situ: results of an Italian multi-institutional retrospective study. *Radiat Oncol.* 2012 Oct 25;7(1):177. [Epub ahead of print]
- 25.Donker M, Litière S, Werutsky G, et al. Breast-conserving treatment with or without radiotherapy in ductal carcinoma In Situ: 15-year recurrence rates and outcome after a recurrence, from the EORTC 10853 randomized phase III trial. *J Clin Oncol.* 2013 Nov 10;31(32):4054-9.
- 26.Goodwin A, Parker S, Gherzi D, et al. Post-operative radiotherapy for ductal carcinoma in situ of the breast. *Cochrane Database Syst Rev.* 2013 Nov 21;11:CD000563. doi: 10.1002/14651858.CD000563.pub7.
- 27.Allred DC, Anderson SJ, Paik S, et al. Adjuvant tamoxifen reduces subsequent breast cancer in women with estrogen receptor-positive ductal carcinoma in situ: a study based on NSABP protocol B-24. *J Clin Oncol* 2012;30:1268-73
- 28.Alvarado R, Lari SA, Roses RE, et al. Biology, treatment, and outcome in very young and older women with DCIS. *Ann Surg Oncol* 2012;19:3777-84.
- 29.Amichetti M, Vidali C. Radiotherapy after conservative surgery in ductal carcinoma in situ of the breast: a review. *Int J Surg Oncol* 2012;2012:635404. doi: 10.1155/2012/635404. Epub 2012 May 13.
- 30.Australian New Zealand Clinical Trials Registry website. The Trans Tasman Radiation Oncology Group (TROG) 07.01: A randomised phase III study of radiodoses and fractionation schedules in non-low risk Ductal Carcinoma In Situ (DCIS) of the breast to improve time to recurrence. [http://www.anzctr.org.au/trial\\_view.a....](http://www.anzctr.org.au/trial_view.a....) Accessed June 27, 2012.
- 31.Lambert K, Patani N, Mokbel K. Ductal carcinoma in situ: recent advances and future prospects. *Int J Surg Oncol.* 2012;2012:347385. doi: 10.1155/2012/347385. Epub 2012 May 17.
- 32.Lee RJ, Vallow LA, McLaughlin SA, et al. Ductal carcinoma in situ of the breast. *Int J Surg Oncol.* 2012;2012:123549. doi: 10.1155/2012/123549. Epub 2012 Jul 18.
- 33.Leitlinienprogramm Onkologie der AWMF, Deutschen Krebsgesellschaft e.V. und Deutschen Krebshilfe e.V. Interdisziplinäre S3-Leitlinie für die Diagnostik, Therapie und Nachsorge des Mammakarzinoms. 3. Auflage: Aktualisierung 2012. Zuckschwerdt Verlag, 2012 ISBN: 978-3-86371-073-6; siehe auch:

<http://www.awmf.org/leitlinien/detail/II/032-045OL.html>

34. McCormick B. RTOG 9804: A prospective randomized trial for “good risk” ductal carcinoma in situ (DCIS), comparing radiation (RT) to observation (OBS). J Clin Oncol 2012;30 (suppl; abstr 1004).
35. McCormick B, Moughan J, Hudis C, et al. Low-risk breast ductal carcinoma in situ (DCIS): results from the Radiation Therapy Oncology Group 9804 Phase 3 Trial. Int J Radiat Oncol Biol Phys 2012;84(5) Suppl., S5 abstract 11
36. Morrow M. Refining the use of endocrine therapy for ductal carcinoma in situ. J Clin Oncol 2012;30:1249-51.
37. Morrow M, Katz SJ. Margins in ductal carcinoma in situ: is bigger really better? J Natl Cancer Inst 2012;104:494-5
38. Fredrik Wärnberg, Hans Garmo, Stefan Emdin, et al. Effect of Radiotherapy After Breast-Conserving Surgery for Ductal Carcinoma in Situ: 20 Years Follow-Up in the Randomized SweDCIS Trial. J Clin Oncol 2014; 32:3613-3618.
39. Abram Recht. Are the Randomized Trials of Radiation Therapy for Ductal Carcinoma in Situ Still Relevant? J Clin Oncol 2014; 32(22): 3588
40. Lawrence J. Solin, Robert Gray, Lorie L. Hughes et al. Surgical Excision Without Radiation for Ductal Carcinoma in Situ of the Breast: 12-Year Results From the ECOG-ACRIN E5194 Study. J Clin Oncol 2015; 33 (33):3938
41. Beryl McCormick, Kathryn Winter, Clifford Hudis, et al. RTOG 9804: A Prospective Randomized Trial for Good-Risk Ductal Carcinoma In Situ Comparing Radiotherapy With Observation. J Clin Oncol 2015; 33(7): 709
42. David Krug, Rainer Souchon. Radiotherapy of Ductal Carcinoma In Situ. Breast Care 2015;10:259–264.
43. Wang L, Xia Y, Liu D, Zeng Y, Chang L, Li L, Hou Y, Ge L, Li W, Liu Z. Evaluating the efficacy of post-surgery adjuvant therapies used for ductal carcinoma (ca. in situ) patients: a network meta-analysis. Oncotarget. 2017;8(45):79257-79269.
44. Garg PK, Jakhetiya A, Pandey R, et al. Adjuvant radiotherapy versus observation following lumpectomy in ductal carcinoma in-situ: A meta-analysis of randomized controlled trials. Breast J. 2017 Aug 22. doi: 10.1111/tbj.12889. [Epub ahead of print]

### Mastektomie

1. Chadha M, Portenoy J, Boolbol SK, et al. Is there a role for postmastectomy radiation therapy in ductal carcinoma in situ? Int J Surg Oncol 2012;2012:423520. doi: 10.1155/2012/423520. Epub 2012 Jun 13.

### Sonderformen der Radiotherapie:

#### Teilbrustbestrahlung

1. Monticciolo DL, Biggs K, Gist AK, et al Breast Conserving Therapy with accelerated partial breast versus external beam whole breast irradiation:

comparison of imaging sequela and complications in a matched population. *The Breast Journal* 2011; 17(2) 187-190

2. Aburabia M, Roses RE, Kuerer HM, et al. Axillary failure in patients treated with MammoSite accelerated partial breast irradiation. *Ann Surg Oncol* 2011; 18:3415-3421
3. Goyal S, Vicini F, beitsch PD et al. Ductal carcinoma In Situ Treated With Breast-Conserving Surgery and Accelerated Partial Breast Irradiation: A Comparison of Mammosite Registry Trial With Intergroup Study 5194. *Cancer* 2011; 117: 1149-55.
4. Stull TS, Goodwin MC, Gracely EJ, et al. A Single Institution Review of Accelerated Partial Breast Irradiation in Patients considered "Cautionary" by the American Society for Radiation Oncology. *Ann Surg Oncol* 2011; (epub ahead)
5. Punglia RS, Burstein HJ, Weeks JC et al. Radiation Therapy for Ductal Carcinoma In Situ. *Cancer* 2011; (epub ahead)
6. Khan AJ, Arthur D, Vicini F, et al. Six-Year Analysis of Treatment-Related Toxicities in Patients Treated with Accelerated Partial Breast Irradiation on the American Society of Breast Surgeons MammoSite Breast Brachytherapy Registry Trial. *Ann Surg Oncol* 2011; (epub ahead)
7. National Cancer Institute website. NSABP B-39: Phase III randomized study of adjuvant whole-breast versus partial-breast irradiation in women with ductal carcinoma in situ or stage I or II breast cancer.  
<http://www.cancer.gov/clinicaltrials/search/view?cdrid=409590&version=HealthProfessional>. Accessed June 26, 2012.
8. Riou O, Lemanski C, Guillaumon V et al. Role of the radiotherapy boost on local control in ductal carcinoma in situ. *Int J Surg Oncol*. 2012;2012:748196. doi: 10.1155/2012/748196. Epub 2012 Apr 8.
9. Wong JS, Chen YH, Gadd MA, et al. Eight-year update of a prospective study of wide excision alone for small low- or intermediate-grade ductal carcinoma in situ (DCIS). *Breast Cancer Res Treat*. 2014 Jan;143(2):343-50.
10. John Paul Einck, Steven E. Finkelstein, Ben Han et al. Accelerated partial-breast irradiation using strut-based brachytherapy in ductal carcinoma in situ patients: A report on 321 patients with median 25-month follow-up. *J Clin Oncol* 31, 2013 (suppl 26; abstr 92)
11. S. S. Park, I. S. Grills, P. Y. Chen, et al. Outcomes for accelerated partial-breast irradiation (APBI) in pure ductal carcinoma in situ (DCIS) patients. *J Clin Oncol* 31, 2013 (suppl 26; abstr 100)
12. B. E. Amendola, C. P. Amendola, N. C. Perez. DCIS of the breast treated with balloon brachytherapy: 7-year follow-up. *J Clin Oncol* 31, 2013 (suppl 26; abstr 142)
13. Ying L., Derek T. Schloemann, Min Lian et al. Accelerated partial breast irradiation through brachytherapy for ductal carcinoma in situ: factors influencing utilization and risks of second breast tumors. *Breast Cancer Res Treat* (2015) 151:199–208.

14. Vratislav Strnad, Oliver J Ott, Guido Hildebrandt, et al. on behalf of the Groupe Européen de Curiethérapie of European Society for Radiotherapy and Oncology (GEC-ESTRO). 5-year results of accelerated partial breast irradiation using sole interstitial multicatheter brachytherapy versus whole-breast irradiation with boost after breast-conserving surgery for low-risk invasive and in-situ carcinoma of the female breast: a randomised, phase 3, non-inferiority trial. [www.thelancet.com](http://www.thelancet.com) Published online October 20, 2015

#### Hypofraktionierte Radiotherapie

1. Hathout L, Hijal T, Théberge V, et al. Hypofractionated radiation therapy for breast ductal carcinoma in situ. *Int J Radiat Oncol Biol Phys.* 2013 Dec 1;87(5):1058-63.

#### Boost-RT des Tumorbettes

1. Wong P, Lambert C, Agnihotram RV, et al. Ductal Carcinoma In Situ – The Influence of the Radiotherapy Boost on Local Control. *Int J Radiation Oncology Biol Phys* 2011; (epub ahead)
2. Rakovitch E, Narod SA, Nofech-Moses S, et al. Impact of boost radiation in the treatment of ductal carcinoma in situ: a population-based analysis. *Int J Radiat Oncol Biol Phys.* 2013 Jul 1;86(3):491-7.
3. Guenzi M, Giannelli F, Bosetti D, et al. Two different hypofractionated breast radiotherapy schedules for 113 patients with ductal carcinoma in situ: preliminary results. *Anticancer Res.* 2013 Aug;33(8):3503-7.

#### Bei Patientinnen unter 45-50 Jahren

## Cochrane Analyse Postoperative Radiatio (Gesamtkollektiv mit Radiatio nach BEO)

Goodwin A, Parker S, Gherzi D, Wilcken N.  
Post-operative radiotherapy for ductal carcinoma  
in situ of the breast.  
Cochrane Database Syst Rev. 2013 Nov 21;11:CD000563.  
doi: 10.1002/14651858.CD000563.pub7.



## DCIS – Postoperative adjuvante Systemtherapie

- Postoperative endokrine Therapie hat keinen Einfluss auf das Gesamtüberleben. **LOE 1a**
- Postoperative endokrine Therapie kann einen geringen Effekt auf die ipsilateralen invasiven Rezidive haben. **LOE 1a**
- Endokrine Therapie hat einen Effekt auf die kontralaterale invasive Rezidivrate und die ipsilaterale und kontralaterale DCIS-Rezidivrate. **LOE 1a**
- The number needed to treat (für jedes In-Brust-Rezidiv) ist 15. **LOE 1a**



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## **Cochrane Analyse Tamoxifen nach DCIS (Gesamtkollektiv / mit Radiatio)**

**Staley H, McCallum I, Bruce J. Postoperative tamoxifen for ductal carcinoma in situ. Cochrane Database Syst Rev. 2012 Oct 17;10:CD007847.  
doi: 10.1002/14651858.CD007847.pub2.**

**Staley H, McCallum I, Bruce J. Postoperative Tamoxifen for ductal carcinoma in situ: Cochrane systematic review and metaanalysis. Breast. 2014 Oct;23(5):546-51.  
doi: 10.1016/j.breast.2014.06.015.  
Epub 2014 Jul 9.**

1. H. Staley, I. McCallum, J. Bruce. The Breast 23 (2014) 546e551



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## DCIS - Postoperative adjuvante Systemtherapie

	Oxford LoE	GR	AGO
■ Tamoxifen (nur ER+)	1a	A	+/-*
■ Aromataseinhibitor (nur ER+) bei postmenopausalen Patientinnen	1b	A	+/-*
■ Trastuzumab (nur HER2+)	5	D	--

\* Indikation zur Therapie ist von Risikofaktoren, Nebenwirkungen und Patientinnenpräferenz abhängig.

### Tamoxifen (nur ER+, nur BET)

1. Fisher B, Dignam J, Wolmark N, et al. Tamoxifen in treatment of intraductal breast cancer: National Surgical Adjuvant Breast and Bowel Project B-24 randomised controlled trial. Lancet. 1999 Jun 12;353(9169):1993-2000.
2. Allred DC Breast Cancer Research and Treatment Vol 76 Suppl 1 Dec 2002: abstract 30
3. Virnig BA, Tuttle TM, Shamliyan T, et al. Ductal Carcinoma In Situ of the Breast: A Systematic Review of Incidence, Treatment, and Outcomes. J Natl Cancer Inst. 2010 Jan 13. [Epub ahead of print]
4. Cuzick J, I Sestak et al. (2010): "Effect of Tamoxifen and radiotherapy in women with locally excised ductal carcinoma in situ: long-term results form the UK / ANZ DCIS trial" Lancet Oncol (12) 21- 29
5. Eng-Wong J, JP Costantino et al. (2010): "The Impact of Systemic Therapy Following Ductal Carcinoma In Situ" J Natl Cancer Inst Monogr (41) 200 – 203
6. Wapnir IL, Dignam JJ, Fisher B, et al. Long-Term Outcomes of invasive ipsilateral breast tumor recurrences after lumpectomy in NSABP B-17 and B-24 randomized clinical trials for DCIS. J Natl Cancer Inst 2011; 103: 478-488
7. Badruddoja M. Ductal carcinoma in situ of the breast: a surgical perspective. Int J Surg Oncol. 2012;2012:761364. doi: 10.1155/2012/761364. Epub 2012 Sep 4.
8. Staley H, McCallum I, Bruce J. Postoperative tamoxifen for ductal carcinoma in situ. Cochrane Database Syst Rev. 2012 Oct 17;10:CD007847. doi:

10.1002/14651858.CD007847.pub2.

9. Lee DY, Lewis JL, Wexelman BA et al. The consequence of undertreatment of patients treated with breast conserving therapy for ductal carcinoma in-situ. Am J Surg. 2013 Nov;206(5):790-7.
10. Sprague BL, McLaughlin V, Hampton JM, et al. Disease-free survival by treatment after a DCIS diagnosis in a population-based cohort study. Breast Cancer Res Treat. 2013 Aug;141(1):145-54.
11. Staley H, McCallum I, Bruce J. Postoperative Tamoxifen for ductal carcinoma in situ: Cochrane systematic review and meta-analysis. Breast. 2014 Oct;23(5):546-51. doi: 10.1016/j.breast.2014.06.015. Epub 2014 Jul 9
12. Jack Cuzick, Ivana Sestak, Simon Cawthorn, et al. Tamoxifen for prevention of breast cancer: extended longterm follow-up of the IBIS-I breast cancer prevention trial. Lancet Oncol 2015; 16: 67–75

#### AI (wenn postmenopausal und Kontraindikationen gegen Tamoxifen)

#### Andere endokrine Optionen Trastuzumab (nur HER2+)

1. Cobleigh MA, Anderson SJ, Julian Tbet al. NSABP B-43: A phase III clinical trial to compare trastuzumab (T) given concurrently with radiation therapy (RT) to RT alone for women with HER2+ DCIS resected by lumpectomy (Lx). SABCS 2012; OT1-2-01
2. Siziopikou KP, Anderson SJ, Cobleigh MA et al. Preliminary results of centralized HER2 testing in ductal carcinoma in situ (DCIS): NSABP B-43. Breast Cancer Res Treat. 2013 Nov;142(2):415-21.
3. Richard G Margolese, Reena S Cecchini, Thomas B Julian, et al. Anastrozole versus tamoxifen in postmenopausal women with ductal carcinoma in situ undergoing lumpectomy plus radiotherapy (NSABP B-35): a randomised, double-blind, phase 3 clinical trial. www.thelancet.com Published online December 10, 2015
4. Patricia A Ganz, Reena S Cecchini, Thomas B Julian, et al. Patient-reported outcomes with anastrozole versus tamoxifen for postmenopausal patients with ductal carcinoma in situ treated with lumpectomy plus radiotherapy (NSABP B-35): a randomised, double-blind, phase 3 clinical trial. www.thelancet.com Published online December 10, 2015
5. John F Forbes, Ivana Sestak, Anthony Howell, et al. Anastrozole versus tamoxifen for the prevention of locoregional and contralateral breast cancer in postmenopausal women with locally excised ductal carcinoma in situ (IBIS-II DCIS): a double-blind, randomized controlled trial. www.thelancet.com Published online December 11, 2015.
6. Wang L, Xia Y, Liu D, et al. Evaluating the efficacy of post-surgery adjuvant therapies used for ductal carcinoma (ca. in situ) patients: a network meta-analysis. Oncotarget. 2017;8(45):79257-79269.

## Behandlung des Lokalrezidivs des DCIS nach Tumorektomie

	Oxford		
	LoE	GR	AGO
<b>After Radiation:</b>			
▪ Einfache Mastektomie	3a	C	+
+ SNB	5	D	+
▪ Sekundäre Tumorektomie führt zu Rezidiven in bis zu 30 % der Fälle (NSABP B17)	5	D	+/-
<b>Keine Radiotherapie</b>			
▪ Therapieindikation wie bei primärer Erkrankung	3	C	++
<b>Prognose für invasive Rezidive scheint besser zu sein als bei primären invasiven Karzinomen. Ca. 50% der Rezidive sind invasiv.</b>			

### Nach Radiatio

#### Einfache Mastektomie

+ SN B

1. Silverstein MJ, MD Lagios et al (1998): "Outcome After Invasive Local Recurrence in Patients With Ductal Carcinoma In Situ of the Breast" J Clin Oncol 16:1367-1373

#### Sekundäre Tumorektomie führt zu Rezidiven in bis zu 30 % der Fälle (NSABP B17)

1. Fisher ER, Dignam J, Tan-Chiu E et al. (1999): "Pathologic findings from the National Surgical Adjuvant Breast Project (NSABP) eight-year update of Protocol B-17: intraductal carcinoma" Cancer 86: 429 – 438

### Keine Radiotherapie

#### Therapieindikation wie bei primär Erkrankung