Ductal Carcinoma in Situ
EVIDENCE TABLE

Reference	Study Type	Patients/ Events	Study Objective (Purpose of Study)	Study Results	Study Quality
1. Consensus Conference on the classification of ductal carcinoma in situ. The Consensus Conference Committee. *Cancer.* 1997;80(9):1798-1802.	Review/Other-Dx	N/A	Report of the Consensus Conference Committee on the classification of DCIS. Presented guidelines and definitions for pathologic classification and evaluation of DCIS specimens, and description of prognostic factors.	N/A	4
2. Lester SC, Bose S, Chen YY, et al. Protocol for the examination of specimens from patients with ductal carcinoma in situ of the breast. *Arch Pathol Lab Med.* 2009;133(1):15-25.	Review/Other-Tx	N/A	A protocol for the examination of specimens from patients with DCIS of the breast is presented by the College of American Pathologists.	N/A	4
3. Rosai J. Borderline epithelial lesions of the breast. *Am J Surg Pathol.* 1991;15(3):209-221.	Review/Other-Tx	N/A	A review on the concept of borderline epithelial lesions of the breast.	No results stated.	4
4. Sloane JP, Ellman R, Anderson TJ, et al. Consistency of histopathological reporting of breast lesions detected by screening: findings of the U.K. National External Quality Assessment (EQA) Scheme. U. K. National Coordinating Group for Breast Screening Pathology. *Eur J Cancer.* 1994;30A(10):1414-1419.	Review/Other-Tx	51 sets of 12 slides which were circulated to 186-251 pathologists	To determine consistency of histopathological reporting in the United Kingdom National Breast Screening Programme.	Consistency in diagnosing invasive carcinoma and radial scar is excellent, and good in DCIS, but improvements are desirable in diagnosing atypical hyperplasia, classifying DCIS and reporting certain prognostic features of invasive tumors. Such improvements will require further research, the development of improved diagnostic criteria and the dissemination of clearer guidelines.	4
5. Fisher B, Dignam J, Wolmark N, et al. Lumpectomy and radiation therapy for the treatment of intraductal breast cancer: findings from National Surgical Adjuvant Breast and Bowel Project B-17. *J Clin Oncol.* 1998;16(2):441-452.	Experimental-Tx	818 patients	A randomized study to evaluate the worth of RT after lumpectomy compared to lumpectomy alone for localized DCIS.	Mean follow-up time was 90 months. Incidence of locoregional and distant events remained similar in both treatment groups; deaths were only infrequently related to breast cancer. Incidence of noninvasive IBT was reduced from 13.4% to 8.2% (P=.007), and of invasive IBT, from 13.4% to 3.9% (P<.0001). All cohorts benefited from radiation regardless of clinical or mammographic tumor characteristics. Through 8 years of follow-up, the findings continue to indicate that lumpectomy plus RT is more beneficial than lumpectomy alone for women with localized, mammographically detected DCIS. When evaluated according to the mammographic characteristics of their DCIS, all groups benefited from radiation.	1

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Reference	Study Type	Patients/ Events	Study Objective (Purpose of Study)	Study Results	Study Quality
6. Fisher ER, Costantino J, Fisher B, Palekar AS, Redmond C, Mamounas E. Pathologic findings from the National Surgical Adjuvant Breast Project (NSABP) Protocol B-17. Intraductal carcinoma (ductal carcinoma in situ). The National Surgical Adjuvant Breast and Bowel Project Collaborating Investigators. *Cancer.* 1995;75(6):1310-1319.	Experimental-Tx	573 DCIS cases from B-17 cohort	A randomized study to analyze the pathologic features predicting for breast failure in B-17.	The presence of moderate/marked comedo necrosis, which was evaluated as an independent parameter rather than as a specific histologic type of DCIS and uncertain/involved lumpectomy margins were the only statistically significant independent predictors of IBT for patients treated by lumpectomy as well as irradiation. The latter markedly reduced the annual hazard rates for the IBT associated with these indicators. Although not an endpoint of this study, the findings suggest that the beneficial effect of irradiation in reducing IBT after lumpectomy for DCIS occurs with small (<1.0 cm) and larger lesions. Moderate/marked comedo necrosis and uncertain/involved lumpectomy margins represent independent predictors of IBT.	1
7. Donker M, Litiere 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;31(32):4054-4059.	Experimental-Tx	1,010 women randomized to no further treatment (local excision group, n = 503) or RT (local excision + RT group, n = 507)	To analyze the long-term risk on developing local recurrence and its impact on survival after local treatment for DCIS.	RT reduced the risk of any local recurrence by 48% (HR, 0.52; 95% CI, 0.40 to 0.68; P<.001). The 15-year local recurrence-free rate was 69% in the local excision group, which was increased to 82% in the local excision + RT group. The 15-year invasive local recurrence-free rate was 84% in the local excision group and 90% in the local excision + RT group (HR, 0.61; 95% CI, 0.42 to 0.87). The differences in local recurrence in both arms did not lead to differences in breast cancer-specific survival rate (HR, 1.07; 95% CI, 0.60 to 1.91) or overall survival (OS; HR, 1.02; 95% CI, 0.71 to 1.44). Patients with invasive local recurrence had a significantly worse breast cancer-specific survival rate (HR, 17.66; 95% CI, 8.86 to 35.18) and OS (HR, 5.17; 95% CI, 3.09 to 8.66) compared with those who did not experience recurrence. A lower overall salvage mastectomy rate after local recurrence was observed in the local excision + RT group than in the local excision group (13% vs 19%, respectively).	1

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Reference	Study Type	Patients/ Events	Study Objective (Purpose of Study)	Study Results	Study Quality
8. Cuzick J, Sestak I, Pinder SE, 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(1):21-29.	Experimental-Tx	1,694 patients	To report updated results of the UK/ANZ DCIS trial with a median follow-up of 12.7 years.	After a median follow-up of 12.7 years (IQR 10.9–14.7), 376 (163 invasive [122 ipsilateral vs 39 contralateral], 197 DCIS [174 ipsilateral vs 17 contralateral], and 16 of unknown invasiveness or laterality) breast cancers were diagnosed. RT reduced the incidence of all new breast events (HR 0.41, 95% CI, 0.30–0.56; P<0.0001), reducing the incidence of ipsilateral invasive disease (0.32, 0.19–0.56; P<0.0001) as well as ipsilateral DCIS (0.38, 0.22–0.63; P<0.0001), but having no effect on contralateral breast cancer (0.84, 0.45–1.58; P=0.6). Tamoxifen reduced the incidence of all new breast events (HR 0.71, 95% CI, 0.58–0.88; P=0.002), reducing recurrent ipsilateral DCIS (0.70, 0.51–0.86; P=0.03) and contralateral tumors (0.44, 0.25–0.77; P=0.005), but having no effect on ipsilateral invasive disease (0.95, 0.66–1.38; P=0.8). No data on adverse events except cause of death were collected for this trial.	1
9. Holmberg L, Garmo H, Granstrand B, et al. Absolute risk reductions for local recurrence after postoperative radiotherapy after sector resection for ductal carcinoma in situ of the breast. *J Clin Oncol.* 2008;26(8):1247-1252.	Experimental-Tx	1,067 women	To evaluate the effects of RT after sector resection for DCIS of the breast in patient groups as defined by age, size of the lesion, focality, completeness of excision and mode of detection.	There were 64 ipsilateral events in the RT arm and 141 in the control group corresponding to a risk reduction of 16.0 percentage points at 10 years (95% CI, 10.3% to 21.6%) and a RR of 0.40 (95% CI, 0.30 to 0.54). There was no statistically significant difference in distant metastasis-free survival. There was an effect modification by age, yielding a low effect of RT in women younger than 50, but substantial protection in women older than 60 years. The age effect was not confounded by focality, lesion size, completeness of excision, or detection mode. There was no group as defined by our stratification variables that had a low risk without RT.	1

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Reference	Study Type	Patients/ Events	Study Objective (Purpose of Study)	Study Results	Study Quality
10. National Cancer Institute (NCI). A Phase III Trial of Accelerated Whole Breast Irradiation With Hypofractionation Plus Concurrent Boost Versus Standard Whole Breast Irradiation Plus Sequential Boost for Early-Stage Breast Cancer. In: ClinicalTrials.gov. Bethesda (MD): National Library of Medicine (US). October 29, 2013. Available from: http://clinicaltrials.gov/ct2/show/NCT01349322?term=NCT01349322. NLM Identifier: NCT01349322.	Review/Other-Tx	Ongoing	Randomized phase III trial to examine how well an accelerated course of higher per daily RT with concomitant boost works compared to standard per daily RT with a sequential boost in treating patients with early-stage breast cancer that was removed by surgery.	This trial is still recruiting study subjects and results are not available yet.	4
11. National Cancer Institute (NCI). A Phase III Clinical Trial Comparing Trastuzumab Given Concurrently With Radiation Therapy and Radiation Therapy Alone for Women With HER2-Positive Ductal Carcinoma In Situ Resected by Lumpectomy. In: ClinicalTrials.gov. Bethesda (MD): National Library of Medicine (US). October 29, 2013. Available from: http://clinicaltrials.gov/ct2/show/study/NCT00769379. NLM Identifier: NCT00769379.	Review/Other-Tx	Ongoing	This randomized phase III trial is studying RT to see how well it works compared with or without trastuzumab in treating women with DCIS who have undergone lumpectomy.	This trial is still recruiting study subjects and results are not available yet.	4
12. National Cancer Institute (NCI). A Randomised Phase III Study of Radiation Doses and Fractionation Schedules in Non-low Risk Ductal Carcinoma In Situ (DCIS) of the Breast. In: ClinicalTrials.gov. Bethesda (MD): National Library of Medicine (US). October 29, 2013. Available from: http://clinicaltrials.gov/ct2/show/NCT00470236?term=NCT00470236. NLM Identifier: NCT00470236.	Review/Other-Tx	Ongoing	1) To improve the outcome of women with non-low risk DCIS treated with BCT. 2) To individualize treatment selection for women with DCIS to achieve long term disease control with minimal toxicity.	This trial is still recruiting study subjects and results are not available yet.	4

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Reference	Study Type	Patients/ Events	Study Objective (Purpose of Study)	Study Results	Study Quality
13. National Cancer Institute (NCI). A Multicentric Phase III Trial Evaluating the Impact of a Radiation Boost (16Gy) After Breast Conserving Surgery and a Whole Breast Irradiation (50Gy) for DCIS. In: ClinicalTrials.gov. Bethesda (MD): National Library of Medicine (US). October 29, 2013. Available from: http://clinicaltrials.gov/ct2/show/NCT00907868?term=NCT00907868. NLM Identifier: NCT00907868.	Review/Other-Tx	Ongoing	Randomized phase III trial to examine BCS followed by whole-breast RT to see how well it works when given with or without additional RT to the tumor in treating women with DCIS.	This trial is still recruiting study subjects and results are not available yet.	4
14. Fisher ER, Leeming R, Anderson S, Redmond C, Fisher B. Conservative management of intraductal carcinoma (DCIS) of the breast. Collaborating NSABP investigators. *J Surg Oncol.* 1991;47(3):139-147.	Observational-Tx	76 patients lumpectomy only (n=21); lumpectomy and breast irradiation (n=27); mastectomy (n=28)	To observe over time patients with DCIS following treatment by lumpectomy only, lumpectomy and breast irradiation, or mastectomy.	Local breast recurrences were similar for women with DCIS and those from this cohort at a similar period of follow-up with invasive cancer treated by lumpectomy only (43% vs 39%) and lumpectomy + irradiation (7% vs 10%). The presence of moderate/marked comedonecrosis was suggestively related to local breast recurrence (P=.07). This latter was significantly reduced for patients receiving post lumpectomy irradiation (P=.01). All local breast recurrences in this study and 29/31 recorded by others occurred at or close to the site of extirpation of the index cancer minimizing multicentricity as a contraindication for the conservative surgical treatment of DCIS. Survival rates which were similar for patients with DCIS regardless of form of local treatment were better than that observed for negative node patients with invasive cancer enrolled in protocol 6. DCIS is a less, not more, ominous disease than invasive cancer. This and other features of its natural history indicate that it would be a contradiction to treat invasive cancer but not DCIS conservatively.	2
15. O'Sullivan MJ, Morrow M. Ductal carcinoma in situ--current management. *Surg Clin North Am.* 2007;87(2):333-351, viii.	Review/Other-Tx	N/A	To summarize the modern evidence-based management of DCIS. The data addressing the surgical issues, including indications for mastectomy and the use of sentinel node biopsy, are presented. The randomized trials examining the role of RT after BCS and the use of tamoxifen in DCIS are discussed.	No results stated.	4

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Reference	Study Type	Patients/ Events	Study Objective (Purpose of Study)	Study Results	Study Quality
16. American College of Radiology. ACR Appropriateness Criteria®: Postmastectomy Radiotherapy. Available at: http://www.acr.org/~/media/ACR/Documents/AppCriteria/Oncology/PostmastectomyRadiotherapy.pdf. Accessed December 10, 2013.	Review/Other-Tx	N/A	To review the role of postoperative radiation therapy in patients treated with modified radical mastectomy for invasive breast cancer, particularly in patients receiving systemic therapy.	N/A	4
17. 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(3):e305-312.	Observational-Tx	145 patients	To determine 20-year rates of local control and outcome-associated factors for DFS after BCT.	The median follow-up time was 19.3 years. IBTR developed in 25 patients, for 5-, 10-, 15-, and 20-year actuarial rates of 9.9%, 12.2%, 13.7%, and 17.5%, respectively. One third of IBTRs were elsewhere failures, and 68% of IBTRs occurred <10 years after diagnosis. Young age and cancerization of lobules predicted for IBTR at <10 years, and increased slide involvement and atypical ductal hyperplasia were associated with IBTR at later time points.	2
18. Wilkinson JB, Vicini FA, Shah C, et al. Twenty-year outcomes after breast-conserving surgery and definitive radiotherapy for mammographically detected ductal carcinoma in situ. *Ann Surg Oncol.* 2012;19(12):3785-3791.	Observational-Tx	129 patients	Management of mammographically detected DCIS at a single institution was reviewed to determine long-term clinical outcomes after treatment with BCT.	The median follow-up was 19.3 years. 21 patients developed an IBTR, 76.2 % of which were invasive (n=16). 14 recurrences (66 %) were within the same breast quadrant (true recurrence), while an additional 7 cases developed an IBTR elsewhere in the breast. True recurrences were more prevalent in women <45 years of age (20 %/24 % vs 5.1%/8 %) at 10 and 20 years (P=0.02). The 5-, 10-, 15-, and 20-year actuarial rates of IBTR for this cohort were 8.7%, 10.4%, 12.1%, and 16.3 % (IBTR), while OS at 5, 10, and 20 years was 97.6%, 96.8%, and 96.8 %, respectively.	3
19. Solin LJ, Fourquet A, Vicini FA, et al. Long-term outcome after breast-conservation treatment with radiation for mammographically detected ductal carcinoma in situ of the breast. *Cancer.* 2005;103(6):1137-1146.	Observational-Tx	1,003 patients from 10 institutions	To determine the long-term outcome after BCS followed by definitive breast RT for women with mammographically detected DCIS of the breast.	15-year OS rate was 89%; 15-year cause-specific survival rate was 98%; 15-year rate of freedom from distant metastases was 97%. 100 local failures (10%) in the treated breast. 15-year rate local failure; 19%, 15-year only first failure was 16%. Results support use of BCS followed by definitive breast RT.	2

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Reference	Study Type	Patients/ Events	Study Objective (Purpose of Study)	Study Results	Study Quality
20. 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(6):478-488.	Experimental-Tx	B-17 trial; 813 patients: B-24 trial; 1,799 patients	To evaluate I-IBTR and its influence on survival among participants in 2 NSABP randomized trials for DCIS.	Of 490 IBTR events, 263 (53.7%) were invasive. Radiation reduced I-IBTR by 52% in the LRT group compared with lumpectomy only (B-17, HR of risk of I-IBTR = 0.48, 95% CI = 0.33 to 0.69, P<.001). Lumpectomy followed by RT + tamoxifen reduced I-IBTR by 32% compared with lumpectomy followed by RT + placebo (B-24, HR of risk of I-IBTR = 0.68, 95% CI = 0.49 to 0.95, P= .025). The 15-year cumulative incidence of I-IBTR was 19.4% for lumpectomy only, 8.9% for lumpectomy followed by RT (B-17), 10.0% for lumpectomy followed by RT + placebo (B-24), and 8.5% for lumpectomy followed by RT + tamoxifen. The 15-year cumulative incidence of all contralateral breast cancers was 10.3% for lumpectomy only, 10.2% for lumpectomy followed by RT (B-17), 10.8% for lumpectomy followed by RT + placebo (B-24), and 7.3% for lumpectomy followed by RT + tamoxifen. I-IBTR was associated with increased mortality risk (HR of death = 1.75, 95% CI = 1.45 to 2.96, P<.001), whereas recurrence of DCIS was not. 22/39 deaths after I-IBTR were attributed to breast cancer. Among all patients (with or without I-IBTR), the 15-year cumulative incidence of breast cancer death was 3.1% for lumpectomy only, 4.7% for lumpectomy followed by RT (B-17), 2.7% for lumpectomy followed by RT + placebo (B-24), and 2.3% for lumpectomy followed by RT + tamoxifen.	1

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Reference	Study Type	Patients/ Events	Study Objective (Purpose of Study)	Study Results	Study Quality
21. Correa C, McGale P, Taylor C, et al. Overview of the randomized trials of radiotherapy in ductal carcinoma in situ of the breast. *J Natl Cancer Inst Monogr*. 2010;2010(41):162-177.	Review/Other-Tx	3,729 women	To report an overview of the randomized trials of RT in DCIS of the breast.	RT reduced the absolute 10-year risk of any IBE (ie, either recurrent DCIS or invasive cancer) by 15.2% (SE 1.6%, 12.9% vs 28.1% 2P<.00001), and it was effective regardless of the age at diagnosis, extent of BCS, use of tamoxifen, method of DCIS detection, margin status, focality, grade, comedonecrosis, architecture, or tumor size. The proportional reduction in IBEs was greater in older than in younger women (2P<.0004 for difference between proportional reductions; 10-year absolute risks: 18.5% vs 29.1% at ages <50 years, 10.8% vs 27.8% at ages ≥50 years) but did not differ significantly according to any other available factor. Even for women with negative margins and small low-grade tumors, the absolute reduction in the 10-year risk of IBEs was 18.0% (SE 5.5, 12.1% vs 30.1%, 2P=.002). After 10 years of follow-up, there was, however, no significant effect on breast cancer mortality, mortality from causes other than breast cancer, or all-cause mortality.	4
22. 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. *International journal of radiation oncology, biology, physics*. 2012;84(3):S5.	Experimental-Tx	585 patients	Results from the Radiation Therapy Oncology Group 9804 phase trial on low risk breast DCIS. Women were randomized to RT or observation.	Due to lower than projected accrual, the study closed early in 2006 with 636 patients, and 585 eligible patients are included in this analysis. Median follow-up time was 7.17 years, with tamoxifen used in 62%; mean age was 59. At 7 years, local failure in the RT arm was 0.9% (95% CI: 0.0–2.2) vs 6.4% in the observation arm (95% CI: 3.2–9.6), P=0.0005. In the observation arm, 12/18 local failure occurred in the same quadrant. The 2 local failures in the RT arm were in distant quadrants. No failures involving skin were observed in either arm. With limited events: age, grade, margin status, and size did not correlate with local failure. Rate of grade 1-2 worst acute toxicity was 30% vs 76%; grade 3-4 toxicities were 4.0% and 4.2%, respectively in the observation and RT arms. The rate of worst late RT toxicity was: grade 1 30%, grade 2 4.6%, and grade 3 0.7%. OS and DFS were excellent in both arms.	1

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Reference	Study Type	Patients/ Events	Study Objective (Purpose of Study)	Study Results	Study Quality
23. 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).	Experimental-Tx	585 patients	RTOG 9804 compares RT to observation for mammographically detected disease, of low or intermediate nuclear grade, <2.5 cm size, and surgical margins ≥3 mm.	Accrual goals for the planned 1,790 patients were not met; the study was closed early. From December 1999 to July 2006, 636 women were randomized to receive 50 Gy in 5 weeks vs observation. 43 women were ineligible on review and 8 withdrew consent. Median follow-up time was 6.46 years. Mean age was 59; tamoxifen was used in 62% of women. There were 2 local failures in the RT arm vs 15 in the observation arm: at 5 years 0.4% RT vs 3.2% observation (P=0.0023, HR [95%CI] = 0.14 [0.03, 0.61]). With limited events, local failure is not correlated with size, grade, margin status, or age. The rate of contralateral breast failures at 5 years was 3.0% for the RT arm vs 1.9% for the observation arm (P=0.42, HR [95%CI] = 1.46 [0.59, 3.62]) and does not appear to be influenced by tamoxifen use (3.6 vs 2.7% tamoxifen). The DFS and OS results were excellent. Rate of grade 1-2 toxicity was 76% in the RT arm vs 30% in the observation arm, and the rate of ≥3 grade toxicities was 4% on both arms.	1
24. Silverstein MJ, Lagios MD, Groshen S, et al. The influence of margin width on local control of ductal carcinoma in situ of the breast. *N Engl J Med.* 1999;340(19):1455-1461.	Observational-Tx	469 specimens of DCIS	To evaluate margin width, the distance between the boundary of the lesion and the edge of the excised specimen as an important determinant of local recurrence.	The mean (+/-SE) estimated probability of recurrence at 8 years was 0.04+/-0.02 among 133 patients whose excised lesions had margin widths of 10 mm or more in every direction. Among these patients there was no benefit from postoperative RT. There was also no statistically significant benefit from postoperative RT among patients with margin widths of 1 to <10 mm. In contrast, there was a statistically significant benefit from radiation among patients in whom margin widths were less than 1 mm. Postoperative RT did not lower the recurrence rate among patients with DCIS that was excised with margins of 10 mm or more. Patients in whom the margin width is less than 1 mm can benefit from postoperative RT.	2

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Reference	Study Type	Patients/ Events	Study Objective (Purpose of Study)	Study Results	Study Quality
25. 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;2010(41):193-196.	Observational-Tx	949 patients	University of Southern California/Van Nuys Prognostic Index was used to analyze local recurrence rates and to update and refine treatment recommendations in a large series of patients with pure DCIS in whom all histopathological factors were collected within a prospective database.	To achieve a local recurrence rate of <20% at 12 years, these data support excision alone for all patients scoring 4, 5, or 6 and patients who score 7 but have margin widths ≥3 mm. Excision plus RT achieves the less than 20% local recurrence requirement at 12 years for patients who score 7 and have margins <3 mm, patients who score 8 and have margins ≥ 3 mm, and for patients who score 9 and have margins ≥5 mm. Mastectomy is required for patients who score 8 and have margins <3 mm, who score 9 and have margins <5 mm, and for all patients who score 10, 11, or 12 to keep the local recurrence rate less than 20% at 12 years.	2
26. Wong JS, Kaelin CM, Troyan SL, et al. Prospective study of wide excision alone for ductal carcinoma in situ of the breast. *J Clin Oncol*. 2006;24(7):1031-1036.	Observational-Tx	158 patients	A prospective, single-arm trial to determine if wide excision alone with margins ≥1 cm may be adequate treatment for small, grade 1 or 2 DCIS.	Despite margins of ≥1 cm, the local recurrence rate is substantial when patients with small, grade 1 or 2 DCIS are treated with wide excision alone. This risk should be considered in assessing the possible use of RT with or without tamoxifen in these patients.	2
27. Hughes LL, Wang 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):5319-5324.	Observational-Tx	105 patients	To determine the risk of IBEs in patients with DCIS treated with local excision without irradiation.	With a median follow-up of 6.2 years, the 5-year rate of IBEs in the 565 eligible patients in the low/intermediate grade stratum was 6.1% (95% CI, 4.1%-8.2%). With a median follow-up of 6.7 years, this incidence for the 105 eligible patients in the high-grade stratum was 15.3% (95% CI, 8.2%-22.5%). Rigorously evaluated and selected patients with low- to intermediate-grade DCIS with margins 3 mm or wider had an acceptably low rate of IBEs at 5 years after excision without irradiation. Patients with high-grade lesions had a much higher rate, suggesting that excision alone is inadequate treatment. Further follow-up is necessary to document long-term results.	2
28. Motwani SB, Goyal S, Moran MS, Chhabra A, Haffty BG. Ductal carcinoma in situ treated with breast-conserving surgery and radiotherapy: a comparison with ECOG study 5194. *Cancer*. 2011;117(6):1156-1162.	Observational-Tx	263 patients	To determine the IBTR in DCIS patients who met the criteria of E5194 treated with lumpectomy and adjuvant whole breast RT.	The average follow-up time was 6.9 years. The 5-year and 7-year IBTR for the low to intermediate grade cohort in this study was 1.5% and 4.4% compared with 6.1% and 10.5% in E5194, respectively. The 5-year and 7-year IBTR for the high grade cohort was 2.0% and 2.0% in this study compared with 15.3% and 18% in E5194, respectively.	2

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29. 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;105(10):701-710.	Review/Other-Tx	327 patients	To determine whether the prospectively defined, 12-gene Oncotype DX DCIS Score (hereafter referred to as the DCIS Score) quantifies local recurrence risk and provides risk information independent of traditional clinical and pathologic characteristics.	The continuous DCIS Score was statistically significantly associated with the risk of developing an IBE (HR = 2.31, 95% CI = 1.15 to 4.49; P=.02) when adjusted for tamoxifen use (prespecified primary analysis) and with invasive IBE (unadjusted HR = 3.68, 95% CI = 1.34 to 9.62; P=.01). For the prespecified DCIS risk groups of low, intermediate, and high, the 10-year risks of developing an IBE were 10.6%, 26.7%, and 25.9%, respectively, and for an invasive IBE, 3.7%, 12.3%, and 19.2%, respectively (both log rank P≤.006). In multivariable analyses, factors associated with IBE risk were DCIS Score, tumor size, and menopausal status (all P≤.02).	4
30. 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;353(9169):1993-2000.	Experimental-Tx	1,804 DCIS patients 902 lumpectomy, RT (50 Gy) and placebo 902 lumpectomy, RT, and tamoxifen	A double-blind randomized controlled trial to determine whether lumpectomy, RT, and tamoxifen is of more benefit than lumpectomy and RT alone for DCIS.	Median follow-up was 74 months. Women in the tamoxifen group had fewer breast-cancer events at 5 years than did those on placebo (8.2% vs 13.4%, P=0.0009). The cumulative incidence of all invasive breast-cancer events in the tamoxifen group was 4.1% at 5 years: 2.1% in the ipsilateral breast, 1.8% in the contralateral breast, and 0.2% at regional or distant sites. The risk of ipsilateral-breast cancer was lower in the tamoxifen group even when sample margins contained tumor and when DCIS was associated with comedonecrosis. The combination of lumpectomy, RT, and tamoxifen was effective in the prevention of invasive cancer.	1

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Reference	Study Type	Patients/ Events	Study Objective (Purpose of Study)	Study Results	Study Quality
31. 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(12):1268-1273.	Observational-Tx	732 patients	To evaluate retrospectively ER and progesterone receptors and their relationships to response to adjuvant tamoxifen in the B-24 trial. The NSABP B-24 study demonstrated significant benefit with adjuvant tamoxifen in patients with DFS after lumpectomy and radiation.	ER was positive in 76% of patients. Patients with ER-positive DCIS treated with tamoxifen (vs placebo) showed significant decreases in subsequent breast cancer at 10 years (HR, 0.49; P<.001) and overall follow-up (HR, 0.60; P=.003), which remained significant in multivariable analysis (overall HR, 0.64; P=.003). Results were similar, but less significant, when subsequent ipsilateral and contralateral, invasive and noninvasive, breast cancers were considered separately. No significant benefit was observed in ER-negative DCIS. Progesterone receptors and either receptor were positive in 66% and 79% of patients, respectively, and in general, neither was more predictive than ER alone.	2
32. Allred DC, Clark GM, Molina R, et al. Overexpression of HER-2/neu and its relationship with other prognostic factors change during the progression of in situ to invasive breast cancer. *Hum Pathol.* 1992;23(9):974-979.	Review/Other-Dx	753 total lesions 30 hyperplastic 15 dysplastic 708 malignant neoplastic	To investigate the role of HER-2/neu in the development and progression of human breast cancer by measuring its overexpression in a series of hyperplastic, dysplastic, and malignant neoplastic lesions of ductal epithelium and by evaluating the relationships between overexpression and clinicopathologic features known to have prognostic significance in these lesions.	Overexpression of HER-2/neu was not observed in any of the hyperplastic or dysplastic lesions. In contrast, it was present in 56% of pure DCIS and in 77% of the comedo subtype of this group. Only 15% of intraductal carcinoma overexpressed HER-2/neu. However, the rate of overexpression was significantly higher in the subset of intraductal carcinoma combined with DCIS compared with the subset of intraductal carcinoma not combined with DCIS (22% vs 11%, respectively; P<.0001). These results are consistent with the hypothesis that HER-2/neu plays a more important role in initiation than in progression of ductal carcinomas. They also suggest that overexpression decreases within individual tumors as they evolve from in situ to increasingly invasive lesions or, alternatively, that many invasive carcinomas arise de novo (ie, without progressing through a significant in situ stage) by mechanisms not involving HER-2/neu.	4

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Reference	Study Type	Patients/ Events	Study Objective (Purpose of Study)	Study Results	Study Quality
33. Bruening W, Fontanarosa J, Tipton K, Treadwell JR, Launders J, Schoelles K. Systematic review: comparative effectiveness of core-needle and open surgical biopsy to diagnose breast lesions. *Ann Intern Med*. 2010;152(4):238-246.	Review/Other-Tx	33 studies of stereotactic automated gun biopsy; 22 studies of stereotactic-guided, vacuum-assisted biopsy; 16 studies of US-guided, automated gun biopsy; 7 studies of US-guided, vacuum-assisted biopsy; 5 studies of freehand automated gun biopsy met the inclusion criteria	A systematic review to compare the accuracy and harms of different breast biopsy methods in average-risk women suspected of having breast cancer.	Core-needle biopsies conducted under stereotactic guidance with vacuum assistance distinguished between malignant and benign lesions with accuracy similar to that of open surgical biopsy. US-guided biopsies were also very accurate. The risk for severe complications is lower with core-needle biopsy than with open surgical procedures (<1% vs 2% to 10%). Women in whom breast cancer was initially diagnosed by core-needle biopsy were more likely than women with cancer initially diagnosed by open surgical biopsy to be treated with a single surgical procedure (random-effects OR, 13.7 [95% CI, 5.5–34.6]). The strength of evidence was rated low for accuracy outcomes because the studies did not report important details required to assess the risk for bias. Stereotactic- and US-guided core-needle biopsy procedures seem to be almost as accurate as open surgical biopsy, with lower complication rates.	4
34. Moran CJ, Kell MR, Flanagan FL, Kennedy M, Gorey TF, Kerin MJ. Role of sentinel lymph node biopsy in high-risk ductal carcinoma in situ patients. *Am J Surg*. 2007;194(2):172-175.	Observational-Dx	62 patients	A prospective study to identify patients with a core biopsy diagnosis of DCIS who may benefit from SLNB.	Postsurgical excision histology revealed invasive disease in 20 patients, 19 of whom had undergone SLNB. Before the adoption of SLNB in selected DCIS patients, all 20 with occult invasive disease would have required second surgery axillary staging (P<.01, chi-square test). SLNB should not be performed routinely for all patients with an initial diagnosis of DCIS. However, selective lymphadenectomy may be a useful clinical adjuvant in selected high-risk DCIS patients.	3

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Reference	Study Type	Patients/ Events	Study Objective (Purpose of Study)	Study Results	Study Quality
35. Meijnen P, Oldenburg HS, Loo CE, Nieweg OE, Peterse JL, Rutgers EJ. Risk of invasion and axillary lymph node metastasis in ductal carcinoma in situ diagnosed by core-needle biopsy. *Br J Surg.* 2007;94(8):952-956.	Review/Other-Dx	171 patients	To assess the risk of invasion and axillary lymph node metastasis in patients with DCIS diagnosed by preoperative core-needle biopsy.	Invasive breast cancer was found in the surgical specimens from 45 tumors (26.2%). Risk factors for invasion were a palpable lesion (OR 2.95 (95% CI, 1.20-7.26); P=0.019), presence of a mass on mammography (OR 3.06 (1.43-6.56); P=0.004), and intermediate (OR 5.81 (1.18-28.57); P=0.030) or poorly differentiated (OR 5.46 (1.17-25.64); P=0.031) tumor grade. SLNB should be considered in women with an initial diagnosis of DCIS on core-needle biopsy who are at risk for invasion; this includes women with a palpable lump, a mass on mammography, and intermediate or poor tumor grade.	4
36. Yi M, Krishnamurthy S, Kuerer HM, et al. Role of primary tumor characteristics in predicting positive sentinel lymph nodes in patients with ductal carcinoma in situ or microinvasive breast cancer. *Am J Surg.* 2008;196(1):81-87.	Review/Other-Tx	624 DCIS patients	To determine the incidence of positive SLNs in patients with DCIS or MIC and the predictive factors of SLN metastasis.	Clinical DCIS size >5 cm was the only independent predictor of positive SLN for patients with a preoperative diagnosis and patients with a final diagnosis of DCIS or MIC. Core biopsy as the method of preoperative diagnosis and DCIS size >5 cm were independent predictors for a final diagnosis of invasive carcinoma in the 149 patients who had a preoperative diagnosis of DCIS or MIC. SLN dissection for patients with a diagnosis of DCIS should be limited to patients who are planned for mastectomy or who have DCIS size >5 cm. Patients who have a core-needle biopsy diagnosis of DCIS have a higher risk of invasive breast cancer on final pathologic assessment of the primary tumor. This information can be used in preoperative counseling of patients with DCIS regarding the timing of SLNB.	4

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Reference	Study Type	Patients/ Events	Study Objective (Purpose of Study)	Study Results	Study Quality
37. Katz A, Gage I, Evans S, et al. Sentinel lymph node positivity of patients with ductal carcinoma in situ or microinvasive breast cancer. *Am J Surg.* 2006;191(6):761-766.	Observational-Tx	130 patients	To determine the rates of SLN positivity in patients with a final diagnosis of DCIS or MIC.	On hematoxylin and eosin staining, 4/110 patients (3.6%) with DCIS had positive SLNs. 4 additional patients had positive SLNs by IHC staining only (3.6%). 2/8 patients underwent completion axillary dissection, and neither had additional involved nodes on completion axillary dissection. 1/21 patients with MIC had positive SLNs by hematoxylin and eosin (4.8%), and another had an involved SLN by IHC staining (4.8%). The patient with the positive SLN by hematoxylin and eosin had one additional node on completion axillary dissection. Rates of SLN positivity for patients with DCIS are modest, even in a high-risk population, and there is continuing uncertainty about its clinical importance.	2
38. Sakr R, Bezu C, Raoust I, et al. The sentinel lymph node procedure for patients with preoperative diagnosis of ductal carcinoma in situ: risk factors for unsuspected invasive disease and for metastatic sentinel lymph nodes. *Int J Clin Pract.* 2008;62(11):1730-1735.	Observational-Dx	195 patients	To assess the value of SLNB in patients with large DCIS who are at highest risk for being upstaged to invasive carcinoma.	Of the 110 patients with pure DCIS, 7 patients (6%) had a metastatic lymph node; 31 patients (16%) were found to have invasive disease upon final histology. Univariate analysis of predictors of unsuspected invasive carcinoma showed that patients having a preoperative biopsy that indicated DCISM or large DCIS were at a higher risk of invasive carcinoma after histological examination of the operative specimen. Of the 31 patients who were upstaged to invasive carcinoma at final histology, 7 patients (22%) had a positive SLNB. The analysis of predictors of positive SLN in our study shows that diffuse DCIS requiring mastectomy is the main risk factor for SLN metastasis. There are no real predictive factors for invasive disease in patients with an initial diagnosis of DCIS or DCISM. Our study supports the value of SLNB in patients with a preoperative DCISM biopsy or patients with a large pure DCIS biopsy requiring mastectomy.	3
39. Farkas EA, Stolier AJ, Teng SC, Bolton JS, Fuhrman GM. An argument against routine sentinel node mapping for DCIS. *Am Surg.* 2004;70(1):13-17; discussion 17-18.	Review/Other-Dx	44 patients	A review of SLN mapping for DCIS to determine the node positive rate and clarify indications for nodal staging in patients with DCIS.	SLN mapping identified at least one sentinel node in all cases. In all cases, the sentinel node(s) were negative for axillary metastasis. SLN mapping should not be routinely performed for patients with DCIS.	4

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Reference	Study Type	Patients/ Events	Study Objective (Purpose of Study)	Study Results	Study Quality
40. Intra M, Veronesi P, Mazzarol G, et al. Axillary sentinel lymph node biopsy in patients with pure ductal carcinoma in situ of the breast. *Arch Surg*. 2003;138(3):309-313.	Review/Other-Dx	223 consecutive patients	To determine whether SLNB should be considered a standard procedure in the treatment of all patients with DCIS, if the lesion is completely excised by radical surgery and there are free margins of resection.	SLN were detected in 7 cases. Because of the low prevalence of metastases, an SLNB should not be considered a standard procedure in all patients with DCIS. In patients with pure DCIS in whom the lesion is completely excised by radical surgery, an SLNB could be avoided. It could be considered in patients with DCIS undergoing mastectomy, in whom there exists a higher risk of harboring an invasive component using definitive histologic features, like large solid tumors or diffuse or multicentric microcalcifications; in these patients, an SLNB cannot be performed at a later operation. Complete axillary dissection may not be mandatory if the SLN is micrometastatic.	4
41. Lara JF, Young SM, Velilla RE, Santoro EJ, Templeton SF. The relevance of occult axillary micrometastasis in ductal carcinoma in situ: a clinicopathologic study with long-term follow-up. *Cancer*. 2003;98(10):2105-2113.	Review/Other-Dx	102 patients	To evaluate how SLN evaluation underscores the need to reevaluate the significance of occult micrometastases in DCIS.	IHC detected micrometastasis has no apparent clinical significance in DCIS. Serial IHC evaluation of lymph nodes dramatically increased the identification of occult micrometastasis. However, IHC detected micrometastasis has no apparent clinical significance in DCIS, based on the current long-term clinicopathologic study. Therefore, the authors questioned the significance of occult micrometastasis, identified by IHC, in DCIS of any type and extent.	4
42. Moore KH, Sweeney KJ, Wilson ME, et al. Outcomes for women with ductal carcinoma-in-situ and a positive sentinel node: a multi-institutional audit. *Ann Surg Oncol*. 2007;14(10):2911-2917.	Observational-Dx	470 patients 3 institutions	To evaluate outcomes for women with DCIS and a positive SLN.	Extensive disease requiring mastectomy (P=0.02) and the presence of necrosis (P=0.04) were associated with an increased risk of nodal positivity. SLNB for high-risk DCIS patients is a mean of detecting those who may have unrecognized invasive disease and therefore are at risk for distant disease.	3

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Reference	Study Type	Patients/ Events	Study Objective (Purpose of Study)	Study Results	Study Quality
43. Dominguez FJ, Golshan M, Black DM, et al. Sentinel node biopsy is important in mastectomy for ductal carcinoma in situ. *Ann Surg Oncol.* 2008;15(1):268-273.	Observational-Dx	179 patients	To evaluate the utility of SLNB for DCIS and its potential to avoid axillary lymph node dissection in patients undergoing mastectomy for DCIS.	The SLN identification rate was 98.9% (177/179). 20 (11.3%) of 177 mastectomies for DCIS had a positive SLNB: 2 micrometastasis (pN1mi) and 18 isolated tumor cells [pN0(i+)]. Unsuspected invasive cancer was found in 20 (11.2%) of 179 mastectomies, 8 T1mic, 5 T1a, 3 T1b, and 4 T1c tumors. Of the 159 patients whose final pathology revealed DCIS without invasion, a sentinel node was identified in 158 (99.4%). 11% of patients undergoing mastectomy for DCIS were found to have invasive cancer on final pathology. The use of SLNB during mastectomy for DCIS allowed nearly all such patients to avoid axillary dissection. These results support routine use of SLNB during mastectomy for DCIS.	3
44. Parikh RR, Haffty BG, Lannin D, Moran MS. Ductal carcinoma in situ with microinvasion: prognostic implications, long-term outcomes, and role of axillary evaluation. *Int J Radiat Oncol Biol Phys.* 2012;82(1):7-13.	Review/Other-Tx	393 patients	To compare the clinical-pathologic features and long-term outcomes for women with DFS vs DCIS with DCISM treated with BCT, to assess the impact of microinvasion.	The DCISM cohort was comprised of 72 of 393 patients (18.3%). Surgical evaluation of the axilla was performed in 58.3% (n=42) of DCISM vs 18.1% (n=58) of DCIS, with only 1 of 42 DCISM (2.3%) vs 0/58 DCIS with axillary metastasis. Surgical axillary evaluation was not an independent predictor of LRR, distant relapse-free survival, or OS in Cox proportional hazards analysis (P>0.05). For the DCIS vs DCISM groups, respectively, the 10-year breast relapse-free survival was 89.0% vs 90.7% (P=0.36), distant relapse-free survival was 98.5% vs 97.9% (P= 0.78), and OS was 93.2% vs 95.7% (P= 0.95). The presence of microinvasion did not correlate with LRR, age, presentation, race, family history, margin status, and use of adjuvant hormonal therapy (all P>0.05). In univariate analysis, pathology (DCIS vs DCISM) was not an independent predictor of LRR (HR, 1.58; 95% CI, 0.58–4.30; P= 0.36), distant relapse-free survival (HR, 0.72; 95% CI, 0.07–6.95; P=0.77), or OS (HR, 1.03; 95% CI, 0.28–3.82; P=0.95).	4

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Reference	Study Type	Patients/ Events	Study Objective (Purpose of Study)	Study Results	Study Quality
45. Solin LJ, Fowble BL, Yeh IT, et al. Microinvasive ductal carcinoma of the breast treated with breast-conserving surgery and definitive irradiation. *Int J Radiat Oncol Biol Phys.* 1992;23(5):961-968.	Observational-Tx	39 consecutive patients	To evaluate outcomes of DCISM of the breast treated with BCS and definitive RT.	The median follow-up was 55 months. The median time to local failure was 42 months. Median follow-up after salvage treatment was 29 months. Comparison of the patients with DCISM with 2 control groups of intraductal carcinoma and invasive ductal carcinoma was performed. Because of the high rates of survival and freedom from distant metastases and because of the ability to salvage patients with local recurrence, BCS and definitive RT should continue to be considered as an alternative to mastectomy for appropriately selected and staged patients with microinvasive ductal carcinoma of the breast.	2
46. Sue GR, Lannin DR, Killelea B, Chagpar AB. Predictors of microinvasion and its prognostic role in ductal carcinoma in situ. *Am J Surg.* 2013;206(4):478-481.	Observational-Tx	205 patients	To determine factors predicting microinvasion and the prognostic role it plays in patients with DCIS.	51 (24.9%) patients had microinvasion on pathology. Patients with microinvasion had larger areas of DCIS and were more likely to have high-grade DCIS of the comedo and solid type associated with necrosis and microcalcifications. On multivariate analysis, none of these factors were independent predictors of microinvasion. With a median follow-up of 8.5 years, there was no difference in the recurrence rate or 5-year actuarial survival between those with microinvasion vs those with pure DCIS.	2
47. Vieira CC, Mercado CL, Cangiarella JF, Moy L, Toth HK, Guth AA. Microinvasive ductal carcinoma in situ: clinical presentation, imaging features, pathologic findings, and outcome. *Eur J Radiol.* 2010;73(1):102-107.	Review/Other-Tx	21 patients	To describe the clinical features, imaging characteristics, pathologic findings and outcome of DCISM.	The clinical presentation and radiologic appearance of a mass are commonly encountered in DCISM lesions (48% and 57%, respectively), irrespective of lesion size, mimicking findings seen in invasive carcinoma. Despite its potential for nodal metastasis (5% in our series), mean follow-up at 36 months was good with no evidence of local or systemic recurrence at follow-up. Knowledge of these clinical and imaging findings in DCISM lesions may alert the clinician to the possibility of microinvasion and guide appropriate management.	4

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Reference	Study Type	Patients/ Events	Study Objective (Purpose of Study)	Study Results	Study Quality
48. Hughes KS, Schnaper LA, Bellon JR, et al. Lumpectomy plus tamoxifen with or without irradiation in women age 70 years or older with early breast cancer: long-term follow-up of CALGB 9343. *J Clin Oncol.* 2013;31(19):2382-2387.	Observational-Tx	711 patients	To determine the risk of IBEs in patients with DFS treated with local excision without irradiation.	With a median follow-up of 6.2 years, the 5-year rate of IBEs in the 565 eligible patients in the low/intermediate grade stratum was 6.1% (95% CI, 4.1% to 8.2%). With a median follow-up of 6.7 years, this incidence for the 105 eligible patients in the high-grade stratum was 15.3% (95% CI, 8.2% to 22.5%).	1
49. Cavaliere A, Scheibel M, Bellezza G, et al. Ductal carcinoma in situ with microinvasion: clinicopathologic study and biopathologic profile. *Pathol Res Pract.* 2006;202(3):131-135.	Review/Other-Tx	31 cases	To study the histopathologic characteristics, the biopathologic profile, as well as the follow-up of a group of patients with DCISM.	The results did not reveal any statistically significant differences between the 2 groups, and there was no statistically significant relationship between the extension of DCIS and the number of microinvasion foci or maximum microinvasion diameter, or between Van Nuys classification of DCIS and again the number of microinvasion foci or maximum microinvasion diameter. DCISM seems associated with good prognosis. None of the patients had relapses or metastases. The data seem to suggest that the natural history of DCISM resembles DCIS, and therefore, suggest that all the surgically removed area should be examined histologically to avoid missing foci of infiltrating breast cancer larger than 1 mm.	4

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Reference	Study Type	Patients/ Events	Study Objective (Purpose of Study)	Study Results	Study Quality
50. Margalit DN, Sreedhara M, Chen YH, et al. Microinvasive breast cancer: ER, PR, and HER-2/neu status and clinical outcomes after breast-conserving therapy or mastectomy. *Ann Surg Oncol.* 2013;20(3):811-818.	Observational-Tx	83 patients	To document the immunophenotype, incidence of axillary metastases and rate of recurrence in a well-defined case series.	52 patients (63%) underwent BCT and 31 (37%) underwent mastectomy. 61% had ER-positive disease and 49% had HER-2/neu-positive disease. 3 (4%) of 68 patients with sentinel node mapping or axillary dissection had single node micrometastases, and none had macrometastases or multiple nodes involved. Median follow-up was 6.4 years, with 6 LRs, 2 regional nodal recurrences, and 2 concurrent local/distant recurrences. The 5-year cumulative incidence of recurrence (local, nodal, or distant) was 5.3% (95% CI, 2.0–13.4) for all patients, and among BCT patients, the 5-year cumulative incidence of LR was 4.2% (95% CI 0.7–12.7). HER-2/neu overexpression was not associated with recurrence (P=0.46). Close/positive margins (≤2 mm) were significantly associated with an increased risk of LR after BCT or mastectomy (HR 8.8; 95% CI, 1.6–48.8; P=0.003).	2
51. Masannat YA, Bains SK, Pinder SE, Purushotham AD. Challenges in the management of pleomorphic lobular carcinoma in situ of the breast. *Breast.* 2013;22(2):194-196.	Review/Other-Tx	N/A	To describe the different histopathological, radiological and clinical features of PLCIS to highlight the different clinicopathological presentations and modalities of treatment described.	PLCIS has different biological features when compared to LCIS. It is more likely to be associated with invasive disease and the IHC profile shows it is less likely to be ER and PR positive with higher positivity of HER-2, Ki-67and p53. It has been suggested that PLCIS should be treated more aggressively than LCIS and surgically excised in similar fashion to DCIS.	4
52. NCCN Clinical Practice Guidelines in Oncology. Breast Cancer. Version 3.2013. 2013; Available at: http://www.nccn.org/professionals/physician_gls/pdf/breast.pdf. Accessed October 20, 2013.	Review/Other-Tx	N/A	NCCN clinical practice guidelines in oncology breast cancer.	N/A	4
53. Ibarra JA. Pleomorphic Lobular Neoplasia of the Breast. ABSD Advisor 2013. 2013:3-8.	Review/Other-Tx	N/A	To comment on the lack of consensus in terminology for lobular neoplasia of the breast.	No results stated.	4

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Reference	Study Type	Patients/ Events	Study Objective (Purpose of Study)	Study Results	Study Quality
54. Laenkholm AV, Jensen MB, Kroman N, Rank F. Breast cancer in situ. From pre-malignant lesion of uncertain significance to well-defined non-invasive malignant lesion. The Danish Breast Cancer Cooperative Group Register 1977-2007 revisited. *Acta Oncol.* 2008;47(4):765-771.	Review/Other-Tx	N/A	To review the DBCG guidelines and recommendations concerning breast cancer in situ and add a brief characterization of the Danish cancer in situ population.	No results stated.	4
55. Carder PJ, Shaaban A, Alizadeh Y, Kumarasuwamy V, Liston JC, Sharma N. Screen-detected pleomorphic lobular carcinoma in situ (PLCIS): risk of concurrent invasive malignancy following a core biopsy diagnosis. *Histopathology.* 2010;57(3):472-478.	Review/Other-Dx	10 patients	To review the radiological and pathological findings in a series of screen-detected PLCIS diagnosed on needle core biopsy with a view to determining the diagnostic features, immunohistological profile and risk of concurrent invasive malignancy.	2 cases were associated with possible microinvasion on the core. 2/10 had invasive lobular carcinoma and one had microinvasive lobular carcinoma on subsequent surgical excision (PPV for malignancy = 30%). There was associated conventional LCIS on either core or excision biopsy in all cases except one. All 3 cases of ER-negative PLCIS arose in the context of ER+ conventional LCIS.	4
56. Bazzocchi M, Zuiani C, Panizza P, et al. Contrast-enhanced breast MRI in patients with suspicious microcalcifications on mammography: results of a multicenter trial. *AJR Am J Roentgenol.* 2006;186(6):1723-1732.	Observational-Dx	112 patients	To test dynamic MRI in evaluating mammographically detected suspicious microcalcifications.	Considering the overall results, the sensitivity of MRI was 87%; specificity, 68%; PPV, 84%; NPV, 71%; and accuracy, 80%. Considering the subgroups of calcifications alone and calcifications associated with masses, the sensitivity values became 80% and 97%; the PPV, 86% and 82%; the NPV, 71% and 75% (95% CI, 0.19–0.99); and the accuracy values, 80% and 82% (95% CI, 0.66–0.92), respectively. An OR of 13.54 (95% CI, 5.20–35.28) showed a raised risk of malignant breast tumor in subjects with positive MRI of mammographically detected suspicious clusters of microcalcifications. The statistical analysis on each subgroup showed an OR of 15.07 (95% CI, 4.73–48.08) for calcifications alone and an OR of 14.00 (95% CI, 1.23–158.84) for calcifications associated with masses. The not-perfect sensitivity of MRI (87%), when applying our interpretation criteria and imaging sequences is a crucial point that prevents us from clinical use of MRI in the diagnosis of mammographically detected microcalcifications.	2

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Reference	Study Type	Patients/ Events	Study Objective (Purpose of Study)	Study Results	Study Quality
57. Raza S, Vallejo M, Chikarmane SA, Birdwell RL. Pure ductal carcinoma in situ: a range of MRI features. *AJR Am J Roentgenol.* 2008;191(3):689-699.	Review/Other-Dx	N/A	To describe and illustrate the variety of common morphologic features, enhancement patterns, and kinetics of pure DCIS on dynamic contrast-enhanced MRI of the breast, using the American College of Radiology BI-RADS lexicon.	Breast MRI plays an important role in the detection of DCIS, which most often appears as nonmass clumped enhancement, in a ductal or segmental distribution, with variable enhancement kinetics.	4
58. Kuhl CK, Schrading S, Bieling HB, et al. MRI for diagnosis of pure ductal carcinoma in situ: a prospective observational study. *Lancet.* 2007;370(9586):485-492.	Observational-Dx	7,319 patients	To investigate the sensitivity with which DCIS is diagnosed by mammography and by breast MRI.	Of the 89 high-grade DCIS, 43 (48%) were missed by mammography, but diagnosed by MRI alone. By contrast, MRI detected 87 (98%) of these lesions; the 2 cases missed by MRI were detected by mammography. Age, menopausal status, personal or family history of breast cancer or of benign breast disease, and breast density of women with MRI-only diagnosed DCIS did not differ significantly from those of women with mammography-diagnosed DCIS. MRI could help improve the ability to diagnose DCIS, especially DCIS with high nuclear grade.	2
59. Menell JH, Morris EA, Dershaw DD, Abramson AF, Brogi E, Liberman L. Determination of the presence and extent of pure ductal carcinoma in situ by mammography and magnetic resonance imaging. *Breast J.* 2005;11(6):382-390.	Observational-Dx	32 patients	To compare the ability of MRI and mammography to determine the presence and extent of DCIS.	DCIS was found at mastectomy without findings on mammography or MRI. MRI had significantly higher sensitivity than mammography for DCIS detection (29/33=88% vs 9/33=27%, P<0.00001). Multiple sites of disease were present in 5 breasts; these were better demonstrated with MRI in 3, mammography in 1, and equally by both in 1. The predominant enhancement pattern of DCIS on MRI was linear/ductal in 18/29 breasts (62%); mammography found calcifications associated with DCIS in 8/9 (89%). The nuclear grade of DCIS found with MRI and mammography was similar; size of lesions was larger on MRI; breast density did not impact results. In this study, MRI was significantly more sensitive than mammography in DCIS detection. In women with known or suspected DCIS, MRI may have an important role to play in assessing the extent of disease in the breast.	4

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Reference	Study Type	Patients/ Events	Study Objective (Purpose of Study)	Study Results	Study Quality
60. Santamaria G, Velasco M, Farrus B, Zanon G, Fernandez PL. Preoperative MRI of pure intraductal breast carcinoma--a valuable adjunct to mammography in assessing cancer extent. *Breast.* 2008;17(2):186-194.	Observational-Dx	86 patients	To evaluate the contribution of preoperative breast MRI as an adjunct to mammography in assessing extent of pure DCIS and to relate MRI findings to histopathological features.	Compared to histopathology, mammography or breast MRI alone underestimated DCIS extent in 18.6% and 31.4% of cases, respectively. When both imaging modalities were considered, DCIS extent was underestimated in 8% of cases. Combined use of mammography and breast MRI revealed good agreement with histopathology to assess DCIS extent (kappa=0.439; P<0.001). MR enhancement of DCIS was related to histologic size (P=0.011). Mammography is more accurate than breast MRI in assessing cancer extent of pure DCIS, but combined use of both imaging techniques leads to improved accuracy.	3
61. Schouten van der Velden AP, Boetes C, Bult P, Wobbes T. The value of magnetic resonance imaging in diagnosis and size assessment of in situ and small invasive breast carcinoma. *Am J Surg.* 2006;192(2):172-178.	Observational-Dx	66 total patients: 54 with DCIS; 12 with DCIS and small invasive carcinoma; 86 total images: 64 mammographic; 22 MRI	To evaluate the value of MRI in diagnosis and size assessment of in situ and small invasive breast carcinoma.	Mammographic rate of detection for DCIS was 48/52 (92%) and for DCIS with small invasive carcinoma, 10/12 (83%). MRI revealed 1 false negative case and the rate of detection for DCIS was 16/17 (94%). Correlation of mammographic size with histopathologic size was r = .44 (P<.01) and r = 0.49 (P=.03) for MRI. Mammography underestimated lesion size by 5 mm or more in 47%, whereas with MRI size was adequately assessed in 43% and overestimated in 38%. DCIS can be visualized on MRI with high sensitivity, although tumor size can be overestimated.	3
62. Shiraishi A, Kurosaki Y, Maehara T, Suzuki M, Kurosumi M. Extension of ductal carcinoma in situ: histopathological association with MR imaging and mammography. *Magn Reson Med Sci.* 2003;2(4):159-163.	Observational-Dx	30 total patients: 12 pure DCIS 18 DCISM	To evaluate the capability of breast MRI and mammography in determining tumor extent and the detectability of DCIS in association with histopathological features.	The mean lesion size was 55.1 mm from the histopathologic results. 26 lesions were detected through the MRI (a sensitivity of 86.7%). MRI depicted 8 lesions without mammographically detected microcalcifications. In 7 cases, MRI showed tumor extent accurately compared with mammography, and the combined diagnosis improved the accuracy of evaluating tumor extent. MRI can complement mammography in guiding surgical treatment of DCIS by providing better assessment of the extent of the lesion.	3

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Reference	Study Type	Patients/ Events	Study Objective (Purpose of Study)	Study Results	Study Quality
63. Esserman LJ, Kumar AS, Herrera AF, et al. Magnetic resonance imaging captures the biology of ductal carcinoma in situ. *J Clin Oncol.* 2006;24(28):4603-4610.	Observational-Dx	45 patients	To investigate whether MRI features of DCIS reflect differences in biology and pathology.	Histopathologic and IHC variables correlated with MRI features (r = 0.73). The correlation was largely due to size, density (by either MRI or pathology), and inflammation (P<.05). Most small focal masses were ER+. MRI enhancement patterns that were clumped were more likely than heterogeneous patterns to be high-grade lesions. Homogenous lesions were large, high grade, and rich in macrophages. Presence of comedo necrosis and size could be distinguished on MRI (P<.05). MRI was most likely to over-represent the size of less dense, diffuse DCIS lesions.	3
64. Estevez LG, Alvarez I, Segui MA, et al. Current perspectives of treatment of ductal carcinoma in situ. *Cancer Treat Rev.* 2010;36(7):507-517.	Review/Other-Tx	N/A	A review to address whether all the patients should receive RT, whether MRI is a reliably radiologic tool for DCIS, if tamoxifen should be offered to all the positive estrogen tumors and to determine the prognosis of the different subtypes.	Mastectomy has almost a 100% success rate in local control but there are no randomized studies demonstrating that mastectomy is better than conservative surgery followed by RT. SLN is recommended for patients with clinically palpable, large DCIS in which the risk of microinvasion is high as well as in extensive DCIS requiring mastectomy.	4
65. Jeruss JS, Kuerer HM, Beitsch PD, Vicini FA, Keisch M. 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.	Observational-Tx	194 patients	To confirm initial findings presented by the ASBS in 2005 regarding the use of MammoSite for treatment of DCIS. This study also includes data on 5-year recurrence that are consistent with data reported for patients treated with whole-breast irradiation, and supports the use of MammoSite in selected patients with DCIS.	Of the 194 patients, 87 (45%) had the MammoSite placed at lumpectomy; 107 patients (55%) had the device placed postlumpectomy. In the first year of follow-up, 16 patients developed a breast infection, though the method of device placement was not associated with infection risk. Also, 46 patients developed a seroma that was associated with applicator placement at the time of lumpectomy (P=0.001). For patients with at least 5 years of follow-up, 92% had favorable cosmetic results. There were 6 patients (3.1%) who had an ipsilateral breast recurrence, with 1 (0.5%) experiencing recurrence in the breast and axilla, for a 5-year actuarial local recurrence rate of 3.39%.	2

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Reference	Study Type	Patients/ Events	Study Objective (Purpose of Study)	Study Results	Study Quality
66. Goyal S, Vicini F, Beitsch PD, et al. Ductal carcinoma in situ treated with breast-conserving surgery and accelerated partial breast irradiation: comparison of the Mammosite registry trial with intergroup study E5194. *Cancer*. 2011;117(6):1149-1155.	Observational-Tx	70 patients	To determine the IBTR in DCIS patients treated in the American Society of Breast Surgeons MammoSite Breast Brachytherapy Registry Trial who met the criteria for E5194 treated with local excision and adjuvant APBI.	In the low to intermediate grade cohort, the 5-year IBTR was 0%, compared with 6.1% at 5 years in E5194. In the high grade cohort, the 5-year IBTR was 5.3%, compared with 15.3% at 5 years in E5194. The overall 5-year IBTR was 2%, and there were no cases of elsewhere or regional failures in the entire cohort. The 5-year contralateral breast event rate was 0% and 5.6% in low to intermediate grade and high grade patients, respectively (compared with 3.5% and 4.2%, respectively, in E5194).	2
67. Abbott AM, Portschy PR, Lee C, et al. Prospective multicenter trial evaluating balloon-catheter partial-breast irradiation for ductal carcinoma in situ. *Int J Radiat Oncol Biol Phys*. 2013;87(3):494-498.	Observational-Tx	41 patients	To determine outcomes of APBI with MammoSite in the treatment of DCIS after BCS.	A total of 41 patients (42 breasts) completed treatment in the study, with a median follow-up of 5.3 years. Overall, 28 patients (68.3%) experienced an adverse event. Skin changes and pain were the most common adverse events. Cosmetic outcome at 6 months was judged excellent/good by 100% of physicians and by 96.8% of patients. At 12 months, 86.7% of physicians and 92.3% of patients rated the cosmetic outcome as excellent/good. Overall, 4 patients (9.8%) developed an IBTR (all DCIS), with a 5-year actuarial rate of 11.3%. All IBTRs were outside the treatment field. Among patients with IBTRs, the mean time to recurrence was 3.2 years.	2
68. Smith BD, Arthur DW, Buchholz TA, et al. Accelerated partial breast irradiation consensus statement from the American Society for Radiation Oncology (ASTRO). *Int J Radiat Oncol Biol Phys*. 2009;74(4):987-1001.	Review/Other-Tx	645 original research articles; 4 published randomized clinical trials and 38 prospective single-arm studies	To present guidance for patients and physicians regarding the use of APBI based on current published evidence complemented by expert opinion.	Task Force proposed 3 patient groups: a "suitable" group, for whom APBI outside of a clinical trial is acceptable, a "cautionary" group, for whom caution and concern should be applied when considering APBI outside of a clinical trial, and an "unsuitable" group, for whom APBI outside of a clinical trial is not generally considered warranted. RT is a new technology that may ultimately demonstrate long-term effectiveness and safety comparable to that of whole-breast RT for selected patients with early breast cancer.	4

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EVIDENCE TABLE

Reference	Study Type	Patients/ Events	Study Objective (Purpose of Study)	Study Results	Study Quality
69. Polgar C, Van Limbergen E, Potter R, et al. Patient selection for accelerated partial-breast irradiation (APBI) after breast-conserving surgery: recommendations of the Groupe Europeen de Curietherapie-European Society for Therapeutic Radiology and Oncology (GEC-ESTRO) breast cancer working group based on clinical evidence (2009). *Radiother Oncol.* 2010;94(3):264-273.	Review/Other-Tx	340 articles	To give recommendations on patient selection criteria for the use of APBI based on available clinical evidence complemented by expert opinion.	The GEC-ESTRO Breast Cancer Working Group recommends 3 categories guiding patient selection for APBI: A low-risk group for whom APBI outside the context of a clinical trial is an acceptable treatment option; including patients age at least 50 years with unicentric, unifocal, pT1-2 (≤30 mm) pN0, non-lobular invasive breast cancer without the presence of an extensive intraductal component and lympho-vascular invasion and with negative surgical margins of at least 2mm. A high-risk group, for whom APBI is considered contraindicated; including patients ageing ≤40 years; having positive margins, and/or multicentric or large (>30 mm) tumors, and/or extensive intraductal component positive or lympho-vascular invasion positive tumors, and/or 4 or more positive lymph nodes or unknown axillary status (pNx). An intermediate-risk group, for whom APBI is considered acceptable only in the context of prospective clinical trials. These recommendations will provide a clinical guidance regarding the use of APBI outside the context of a clinical trial before large-scale randomized clinical trial outcome data become available. Furthermore they should promote further clinical research focusing on controversial issues in the treatment of early-stage breast carcinoma.	4
70. RTOG 0413 Protocol Information. NSABP B-39: A Randomized Phase III Study of Conventional Whole Breast Irradiation (WBI) versus Partial Breast Irradiation (PBI) for Women with Stage 0, I, or II Breast Cancer. In: RTOG Radiation Therapy Oncology Group. Philadelphia (PA): October 29, 2013. Available from: http://www.rtog.org/ClinicalTrials/ProtocolTable/StudyDetails.aspx?study=0413.	Review/Other-Tx	Ongoing	To determine whether partial breast irradiation limited to the region of the tumor bed following lumpectomy provides equivalent local tumor control in the breast compared to conventional whole breast irradiation in the local management of early stage breast cancer.	This trial is still ongoing and results are not available yet.	4

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Reference	Study Type	Patients/ Events	Study Objective (Purpose of Study)	Study Results	Study Quality
71. Julian TB, Costantino JP, Vicini FA, et al. Early toxicity results with 3D conformal external beam therapy (CEBT) from the NSABP B-39/RTOG 0413 accelerated partial breast irradiation (APBI) trial. *ASCO Meeting Abstracts.* 2011;29(15_suppl):1011.	Experimental-Tx	3,862 patients	To report the current levels of toxicity with 3D conformal external beam therapy from the NSABP B-39/RTOG 0413 APBI.	3,862 patients are enrolled (89.8% of target accrual). Toxicity data are available for 1,386 patients randomized to APBI who have received 3D conformal external beam therapy, with 974 of the latter group in their 3rd year of follow-up. With a mean time on study of 41.0 months, no significant toxicity-related issues have been raised. The rates of fibrosis-cosmesis and fibrosis-deep connective tissue toxicities are: Grade 2 12%, Grade 3 3% and Grade 4/5 =0% for the 3D conformal external beam therapy used in the trial.	1
72. Ciervide R, Dhage S, Guth A, et al. Five year outcome of 145 patients with ductal carcinoma in situ (DCIS) after accelerated breast radiotherapy. *Int J Radiat Oncol Biol Phys.* 2012;83(2):e159-164.	Observational-Tx	145 patients	To test hypofractionation regimens of RT after BCS in DCIS patients, the authors studied 2 accelerated treatment regimens. The first trial (New York University [NYU] 01-51) prescribed to the whole breast 42 Gy (2.8 Gy in 15 fractions) and the second trial (NYU 05-181) 40.5 Gy (2.7 Gy in 15 fractions) with an additional daily boost of 0.5 Gy to the surgical cavity.	Between 2002 and 2009, 145 DCIS patients accrued, 59 to the first protocol and 86 to the second trial. Median age was 56 years and 65% were postmenopausal at the time of treatment. Based on optimal sparing of normal tissue, 79% of the patients were planned and treated prone and 21% supine. At 5 years' median follow-up (60 months; range 2.6-105.5 months), 6 patients (4.1%) experienced an ipsilateral breast recurrence in all cases of DCIS histology. In 3/6 patients, recurrence occurred at the original site of DCIS and in the remaining 3 cases outside the original tumor bed. New contralateral breast cancers arose in 3 cases (1 DCIS and 2 invasive carcinomas). Cosmetic self-assessment at least 2 years after treatment is available in 125 patients: 91% reported good-to-excellent and 9% reported fair-to-poor outcomes.	2

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Reference	Study Type	Patients/ Events	Study Objective (Purpose of Study)	Study Results	Study Quality
73. Williamson D, Dinniwell R, Fung S, Pintilie M, Done SJ, Fyles AW. Local control with conventional and hypofractionated adjuvant radiotherapy after breast-conserving surgery for ductal carcinoma in-situ. *Radiother Oncol.* 2010;95(3):317-320.	Observational-Tx	266 patients	To review local control outcomes for a nonrandomized cohort of patients treated with adjuvant conventional and hypofractionated schedules in routine use at Princess Margaret Hospital following BCS for DCIS.	104 patients (39%) were treated with conventional and 162 (61%) with hypofractionated whole breast irradiation. The median age was 56.7 years (range 32.2-83.8 years), and prognostic features were well matched in both groups, apart from a small increase in tumor size in the conventional arm (1.75 vs 2.12 cm, P=0.05). Actuarial risk of recurrence at 4 years was 7% with hypofractionated whole breast irradiation and 6% with the conventional schedule (P=0.9). Univariate analysis showed an increased risk of recurrence with high nuclear grade tumors (11% at 4 years for grade 3 vs 4% for grade 1/2, P=0.029).	2
74. Hathout L, Hijal T, Theberge V, et al. Hypofractionated radiation therapy for breast ductal carcinoma in situ. *Int J Radiat Oncol Biol Phys.* 2013;87(5):1058-1063.	Observational-Tx	440 patients	To retrospectively review records of all women with DCIS at 3 institutions treated with BCS followed by hypofractionated whole-breast RT delivered in 16 fractions.	After a median follow-up time of 4.4 years, 14 patients had an ipsilateral local relapse, resulting in a local recurrence-free survival of 97% at 5 years. Positive surgical margins, high nuclear grade, age <50 years, and a premenopausal status were all statistically associated with an increased occurrence of local recurrence. Tumor hormone receptor status, use of adjuvant hormonal therapy, and administration of additional boost RT did not have an impact on local control in our cohort. On multivariate analysis, positive margins, premenopausal status, and nuclear grade 3 tumors had a statistically significant worse local control rate.	2

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EVIDENCE TABLE

Reference	Study Type	Patients/ Events	Study Objective (Purpose of Study)	Study Results	Study Quality
75. Smith BD, Bentzen SM, Correa CR, et al. Fractionation for Whole Breast Irradiation: An American Society for Radiation Oncology (ASTRO) Evidence-Based Guideline. *Int J Radiat Oncol Biol Phys.* 2011;81(1):59-68.	Review/Other-Tx	N/A	To develop an evidence-based guideline to provide direction for clinical practice.	The majority of patients in randomized trials were aged 50 years or older, had disease stage pT1-2 pN0, did not receive chemotherapy, and were treated with a radiation dose homogeneity within +/-7% in the central axis plane. Data were sufficient to support the use of hypofractionated-whole breast irradiation for patients with early-stage breast cancer who met all the aforementioned criteria. For other patients, the task force could not reach agreement either for or against the use of hypofractionated-whole breast irradiation, which nevertheless should not be interpreted as a contraindication to its use.	4
76. Morrow M, Strom EA, Bassett LW, et al. Standard for the management of ductal carcinoma in situ of the breast (DCIS). *CA Cancer J Clin.* 2002;52(5):256-276.	Review/Other-Tx	N/A	Guidelines for the management of DCIS of the breast from the American College of Radiology, the American College of Surgeons, the College of American Pathology, and the Society of Surgical Oncology.	N/A	4

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Reference	Study Type	Patients/ Events	Study Objective (Purpose of Study)	Study Results	Study Quality
77. Whaley JT, Lester-Coll NH, Morrissey SM, Milby AB, Hwang W-T, Prosnitz RG. Use of postexcision preirradiation mammography in patients with ductal carcinoma in situ of the breast treated with breast-conserving therapy. *Practical Radiation Oncology.* 2013;3(3):e107-e112.	Observational-Tx	144 patients underwent postexcision preirradiation mammography	To investigate the value of postexcision preirradiation mammography in the management of patients with DCIS.	Of the 144 patients who received postexcision preirradiation mammography, 34 (24%; 95% CI, 17%–31%) had residual suspicious calcifications (a "positive postexcision preirradiation mammography"). Of the 34 patients with a positive postexcision preirradiation mammography, all underwent a re-excision and 19 (56%; 95% CI, 35%–70%) were found to have residual malignancy. 10/34 patients with a positive postexcision preirradiation mammography had negative margins, of which 6 had a residual malignancy. Assuming all patients with close, positive, or indeterminate surgical margins would have undergone re-excision regardless of the findings of postexcision preirradiation mammography, postexcision preirradiation mammography resulted in a change in surgical management in 7% (10/144) of patients and removal of residual DCIS in 4% (6/144). With a median follow-up of 9.5 years, the use of postexcision preirradiation mammography was not associated with an improvement in 10-year local recurrence-free survival (94.8% vs 91.5%, P=.368).	2

Evidence Table Key

Study Quality Category Definitions

- *Category 1* The study is well-designed and accounts for common biases.
- *Category 2* The study is moderately well-designed and accounts for most common biases.
- *Category 3* There are important study design limitations.
- *Category 4* The study is not useful as primary evidence. The article may not be a clinical study or the study design is invalid, or conclusions are based on expert consensus. For example:
  a) the study does not meet the criteria for or is not a hypothesis-based clinical study (e.g., a book chapter or case report or case series description);
  b) the study may synthesize and draw conclusions about several studies such as a literature review article or book chapter but is not primary evidence;
  c) the study is an expert opinion or consensus document.

Dx = Diagnostic

Tx = Treatment

Abbreviations Key

APBI = Accelerated partial-breast irradiation
BCS = Breast-conserving surgery
BCT = Breast-conserving therapy
CI = Confidence interval
DCIS = Ductal carcinoma in situ
DCISM = Ductal carcinoma in situ with microinvasion
DFS = Disease-free survival
ER = Estrogen receptor
HR = Hazard ratio
IBE = Ipsilateral breast event
IBT = Ipsilateral breast tumors
IBTRs = Ipsilateral breast tumor recurrences
I-IBTR = Invasive ipsilateral breast tumor recurrences
IHC = Immunohistochemical
LCIS = Lobular carcinoma in situ
LRR = Locoregional relapse
MIC = Microinvasive breast cancer
MRI = Magnetic resonance imaging
NPV = Negative predictive value
OR = Odds ratio
OS = Overall survival
PLCIS =Pleomorphic lobular carcinoma in situ
PMRT = Postmastectomy radiation therapy
PPV = Positive predictive value
RR = Relative risk
RT = Radiation therapy
SLN = Sentinel lymph node
SLNB = Sentinel lymph node biopsy
US = Ultrasound