PICO Search Assignment Worksheet
PICO #9: Mastectomy vs lumpectomy in recurrent breast cancer- Tara Capo

Brief description of patient problem/setting (summarize the case very briefly)
Pt is a 54 YOF with a past history of bilateral breast cancer, who presents to the breast oncology clinic for newly diagnosed ductal carcinoma in situ (DCIS) of the right breast. Her PMHx includes invasive ductal carcinoma of the right breast treated with lumpectomy and adjuvant radiation in 2003, followed by the same diagnosis and treatment of the left breast in 2010. Pt has remained under routine surveillance and was recently found to have suspicious calcifications on screening mammogram. Subsequent biopsy confirmed DCIS of the right breast. Pt is now being evaluated for definitive surgical management; mastectomy was recommended over repeat lumpectomy, but pt seems hesitant. She states she needs time to think about the decision.

Search Question: Clearly state the question (including outcomes or criteria to be tracked)
In women with new ipsilateral ductal carcinoma in situ (DCIS) after previous breast conserving surgery and radiation therapy from invasive carcinoma, does mastectomy compared with repeat breast conserving therapy such as lumpectomy result in lower rates of local recurrence and improved cancer-free survival?

Question Type: What kind of question is this? (boxes now checkable in Word)

□Prevalence	□Screening	□Diagnosis
□Prognosis	□**Treatment**	□Harms

Assuming that the highest level of evidence to answer your question will be meta-analysis or systematic review, what other types of study might you include if these are not available (or if there is a much more current study of another type)? Please explain your choices.
- If meta-analysis or systematic reviews are not available, I would include retrospective and/or prospective cohort studies, and large observational studies. Randomized controlled trials (RCTs) would also be considered if available, although they are uncommon in this clinical scenario due to ethical and practical challenges associated with assigning patients to mastectomy vs repeat lumpectomy.

Retrospective cohort studies are particularly valuable because they often include large numbers of patients with recurrent or new ipsilateral DCIS after prior breast-conserving therapy and can provide data on important outcomes such as local recurrence, disease-free survival, overall survival, and post-op complications. Prospective cohort studies may offer stronger evidence by following patients over time and reducing some forms of bias involved with retrospective designs. Because my PICO question is relatively specific, high-quality observational studies from large cancer centers or national cancer databases can provide meaningful evidence when higher levels of evidence are unavailable.

PICO search terms:

P	**I**	**C**	**O**
Ductal carcinoma in situ	Mastectomy	Lumpectomy	Local recurrence
DCIS	Total mastectomy	Repeat lumpectomy	Cancer-free survival
Previous invasive carcinoma	Surgical removal of breast	Breast conserving surgery	Post-operative complications
Prior lumpectomy			
Prior radiation			

Search tools and strategy used:
Please indicate what data bases/tools you used, provide a list of the terms you searched

together in each tool, and how many articles were returned using those terms and filters. Explain how you narrow your choices to the few selected articles.

Results found:
PubMed:
Ductal carcinoma in situ AND Previous invasive carcinoma AND Lumpectomy AND Mastectomy: 41 results
Filters: free full text, meta analysis, RCT, systematic review: 2 results

DCIS AND Prior radiation AND Mastectomy AND Breast conserving surgery AND Local recurrence: 13 results
Filters: free full text, meta analysis, RCT, systematic review: 1 result

Ductal carcinoma in situ AND Prior radiation AND Mastectomy AND Repeat lumpectomy: 3 results
Filters: free full text, meta analysis, RCT, systematic review: 0 results

Google Scholar:
Repeat lumpectomy vs mastectomy for DCIS after previous radiation therapy: 5,800 results
Filters: since 2022, review articles, sort by relevance: 187 results

Breast conserving therapy for DCIS after previous radiation for invasive ductal carcinoma: 5,070 results
Filters: since 2026, review articles, sort by relevance: 173 results

Local recurrence of breast cancer after lumpectomy for DCIS after invasive carcinoma: 24,200 results
Filters: since 2026, review articles, sort by relevance: 122 results

Cochrane:
DCIS AND lumpectomy AND mastectomy: 1 result

How I chose the articles:
I selected articles based on their relevance to my PICO question, level of evidence, publication date, and applicability to the patient scenario. I used filters to narrow down very large search results and first read article titles, followed by their abstracts to get a sense of whether the article would fit my PICO question. My search initially prioritized systematic reviews and meta-analyses because they provide the highest level of evidence. Because high-level evidence on this specific clinical question was limited, I also included recent retrospective cohort studies that evaluated long-term outcomes of repeat lumpectomy vs mastectomy. I also prioritized articles that were published within the last 5 years.

Results found: Identify at least 4 articles (or other appropriate reputable sources) that answer your specific question with the highest available level of evidence (you will probably need to look at more than 4 articles to get the 4 most focused and highest-level articles to address your question). Please make sure that they are Medline indexed. Selected articles should ideally be published within the last 5 to 10 years to ensure the evidence reflects current clinical standards. If an article older than 10 years is selected, you must provide a specific clinical justification as to why it remains the superior choice or a landmark study over more recent data. In addition to providing the hyperlinks, the PDFs of the full-length articles must also be attached in Brightspace.

Please post the citation and abstract for each article (to include the journal and authors' names and date) and say why you chose it. Please also note what kind of article it is (e.g. meta-analysis, cohort study, or independent blind comparison with the gold standard of diagnosis, etc.).
At the bottom of each abstract, please comment on what your key points are from this article (including any points or concepts included in the article, but not present in the abstract – i.e.

make the concepts understandable to the reader) Please note that if the evidence is not in the abstract, you must clearly summarize the evidence in your posting. Similarly, if the abstract is not present, you will need to summarize the article to highlight the key points. That means writing about 1-2 paragraphs about the article

(1) **Citation:** Mo, C., Guo, J., Zhang, Y., Fu, Y., Luo, J., Zhang, Y., & Li, J. (2021). Repeat breast-conserving surgery versus salvage mastectomy for ipsilateral breast tumor recurrence after breast-conserving surgery in breast cancer patients: A meta-analysis. Frontiers in Oncology, 11, 734719. https://doi.org/10.3389/fonc.2021.734719

Type of article: Meta analysis

Abstract:
Background: Salvage mastectomy (SM) is the standard surgery for ipsilateral breast tumour recurrence (IBTR). However, whether repeat breast-conserving surgery (RBCS) is an alternative method remains unclear. We performed a meta-analysis to compare the effects of RBCS and SM after IBTR for breast-conserving surgery (BCS).

Methods: We searched PubMed, Cochrane, Wiley Online and Embase for controlled studies comparing RBCS and SM after IBTR for BCS (published between 1993 and 2019, published in English). Our main endpoints were the secondary local recurrence rate (SLRR), distant metastasis rate (DMR) and overall survival (OS). We used a random-effects model or fixed-effects model for data pooling.

Results: Fifteen of the 424 eligible studies were ultimately included, and all studies were retrospective cohort studies (n=2532 participants). 1) SLRR: The SLRR of RBCS was higher than SM (pooled relative rate (pRR) = 1.87, 95% CI 1.22 - 2.86, P=0.004). Stratified analysis was performed according to whether radiotherapy was performed after salvage surgery (radiotherapy group: 2ndRT, no radiotherapy group: no-2ndRT), and the following results were revealed: pRR=0.43 (95% CI 0.20-0.95, P=0.04) for group 2ndRT; and pRR=2.30 (95% CI 1.72-3.06, P<0.00001) for group no-2ndRT. These results showed that the main cause of heterogeneity was salvage radiotherapy. 2) DMR: No significant difference in the DMR was observed between RBCS and SM (pRR = 0.61, 95% CI 0.37 - 1.01, P=0.05). 3) OS: No significant difference in OS was observed between RBCS and SM (pRR=0.65, 95% CI 0.39 - 1.08, P=0.10).

Conclusions: The SLRR of RBCS was higher than SM for ITBR after BCS, but survival was not affected. RBCS may be used as an alternative for IBTR patients after BCS with strict control for several indications, such as tumor size, recurrence interval and biological behavior, and attaching importance to subsequent salvage radiotherapy and systematic therapy.

Key points:
- This meta analysis included 15 retrospective cohort studies and 2,532 patients who experienced ipsilateral breast tumor recurrence after prior breast-conserving surgery
- Patients who underwent repeat breast-conserving surgery (RBCS) had a significantly higher rate of second local recurrence compared with those who underwent salvage mastectomy
- Despite the increased local recurrence risk, there was no significant difference in distant metastasis rates or overall survival between repeat lumpectomy and mastectomy
- Patients who received additional radiotherapy after repeat breast-conserving surgery had substantially lower recurrence rates than those who did not receive re-radiation, suggesting that radiation plays an important role in successful breast preservation

I chose this article because it is a meta analysis, which represents one of the highest levels of evidence available for answering my PICO question. It directly compares repeat breast-conserving surgery with

salvage mastectomy in patients who develop ipsilateral breast tumor recurrence after prior breast-conserving therapy. Additionally, it evaluates the exact outcomes relevant to my patient scenario, including local recurrence, distant metastasis, and overall survival. The findings suggest that while mastectomy provides superior local control, repeat breast-conserving surgery may offer comparable long term survival in appropriately selected patients, when considering tumor size, recurrence in interval, tumor biology, and use of adjuvant therapies.

(2) **Citation:** Li, Q., Wang, K., Yang, L., Wu, Q., Wang, Y., Sun, S., Li, X., Wang, J., Wu, X., & He, J. (2021). Long-term survival comparison of repeated breast-conserving surgery versus mastectomy for patients with ductal carcinoma in situ with ipsilateral breast tumor recurrence: A real-world longitudinal study. Clinical Breast Cancer, 21(4), 360–372. https://doi.org/10.1016/j.clbc.2021.02.012

Type of article: Retrospective cohort study

Abstract:
Background: Although patients diagnosed with ductal carcinoma in situ (DCIS) harbor excellent overall survival (OS) after breast-conserving therapy, the evidence regarding to surgical management for ipsilateral breast tumor recurrence (IBTR) is scarce. This study aimed to assess the prognosis of repeated breast-conserving surgery (BCS) versus mastectomy for IBTR in DCIS survivors.

Materials and Methods: Herein, 5344 DCIS cases with IBTR were identified during 702,748 person-years of follow-up, 3532 (66.09%) received mastectomy, and 1812 (33.91%) received repeated BCS. Cox regression and competing risk regression were employed to estimate multivariable-adjusted hazard ratios (HRs) and 95% confidence intervals (CIs) for OS and breast cancer–specific survival (BCSS), which was respectively calculated within spontaneous and matched cohorts.

Results: After adjustment for confounders, no statistically significant survival difference was observed between the repeated BCS and mastectomy for patients with DCIS with IBTR. The stratified analyses further revealed that patients with DCIS with IBTR receiving repeated BCS combined with radiation therapy were associated with both superior OS (HR, 0.79; CI, 0.64-0.98; P =.04) and BCSS (HR, 0.54; CI, 0.33-0.90; P =.02) compared with counterparts undergoing mastectomy. Furthermore, patients with DCIS who were age older than 60 years at IBTR diagnosis benefit from repeated BCS with radiotherapy (HR, 0.44; CI, 0.24-0.84; P =.01) than mastectomy.

Conclusion: We suggest that repeated BCS with radiation therapy deserves consideration when DCIS survivors suffered IBTR. The choice of surgical management should be tailored based on patients' age at IBTR diagnosis and size of recurrent disease.

Key points:
- The study analyzed 5,344 patients with ductal carcinoma in situ (DCIS) who developed ipsilateral breast tumor recurrence (IBTR) after initial breast-conserving surgery. Of these 66% underwent mastectomy and 33.9% underwent repeat breast-conserving surgery (BCS)
- After adjusting for confounding factors and performing propensity score matching, there was no statistically significant difference in overall survival or breast cancer-specific survival between repeat BCS and mastectomy
- Patients who underwent repeat BCS combined with radiation therapy had significant better outcomes than those treated with mastectomy, including improved overall survival and breast cancer-specific survival
- Among patients older than 60 years, repeat BCS with radiation was associated with a significant survival benefit compared with mastectomy, suggesting that age may influence treatment selection

I chose this article because it includes a large sample size of more than 5,000 patients and uses

propensity score matching to reduce bias, strengthening the validity of the findings. Although the article compares repeat breast-conserving surgery (lumpectomy) vs mastectomy for patients with recurrent DCIS, instead of DCIS specifically after invasive carcinoma, it evaluates the exact outcomes relevant to my question, including overall survival, breast cancer-specific survival, and long-term treatment effectiveness. The results provide evidence that repeat lumpectomy with radiation can achieve survival outcomes comparable to mastectomy in select patients.

(3) **Citation**: ElSherif, A., Choi, J., Al-Hilli, Z., Kulkarni, A., Greenberg, C. C., Chung, A., & McLaughlin, S. A. (2022). Repeat lumpectomy as an alternative to salvage mastectomy for ipsilateral breast tumor recurrence. Annals of Surgical Oncology, 29(4), 2305–2314. https://doi.org/10.1245/s10434-021-11107-8

Type of article: Retrospective cohort study

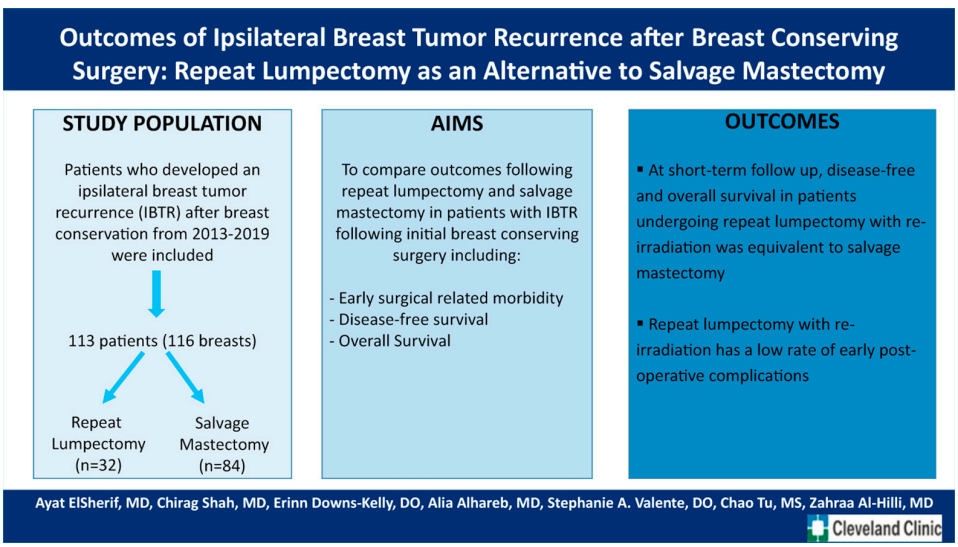
Abstract:
Background: We examined the outcomes of salvage mastectomy and repeat lumpectomy for management of ipsilateral breast tumor recurrence.

Methods: Between 2013 and 2019, 113 patients with an ipsilateral breast tumor recurrence after breast conserving surgery were identified. Patients and tumor characteristics at initial diagnosis and at recurrence were collected. Outcomes evaluated included second recurrence and overall survival. Complications at 30-days and 90-days after surgery for ipsilateral breast tumor recurrence were evaluated.

Results: Seventy-two percent of patients underwent salvage mastectomy (n = 84) and 28% underwent repeat lumpectomy (n = 32 overall, n = 13 reirradiation). Salvage mastectomy patients were younger at initial diagnosis (P =.007) with longer time to ipsilateral breast tumor recurrence from first diagnosis (P =.03). At 2.5 years median follow-up, the overall incidence of second recurrence was 8% with 5% rate (n = 4) in salvage mastectomy group versus 16% (n = 5) in repeat lumpectomy group; however, among patients undergoing repeat lumpectomy with reirradiation (n = 13), only one patient developed a second recurrence (8%). There was no significant difference in rates of second local recurrence (P =.11), disease free survival (P =.13), or overall survival (P =.95) between repeat lumpectomy with reirradiation and salvage mastectomy.

Conclusion: At a short-term follow-up, repeat lumpectomy with reirradiation could be considered in a select group of patients presenting with an ipsilateral breast tumor recurrence with multidisciplinary input with low rates of postoperative complications and equivalent survival outcomes.

Graphical abstract:



Key points:

- The study evaluated 113 patients with ipsilateral breast tumor recurrence (IBTR) after prior breast-conserving therapy. Of these 72% underwent salvage mastectomy and 27% underwent repeat lumpectomy, with some repeat lumpectomy patients receiving re-irradiation
- At a median follow up of 2.5 years, the overall rate of a second recurrence was 8%. The recurrence rate was 5% in the salvage mastectomy group compared with 16% in the repeat lumpectomy group. However, among patients who underwent repeat lumpectomy with re-irradiation, the recurrence rate was only 8%, similar to the mastectomy group
- There was no significant difference in disease-free survival or overall survival between patients treated with repeat lumpectomy plus re-irradiation and those treated with salvage mastectomy
- Repeat lumpectomy was associated with fewer post-op complications than salvage mastectomy

I chose this article because it directly compares the two interventions in my PICO question: repeat lumpectomy vs salvage mastectomy for patients with ipsilateral breast tumor recurrence after prior breast-conserving therapy. The study evaluates important outcomes including recurrence rates, disease-free survival, overall survival, and post-op complications. Additionally, it provides contemporary data supporting repeat lumpectomy with re-irradiation as a potential alternative to mastectomy in select patients, making it highly relevant to my patient.

(4) **Citation**: Diskin, B., Sevilimedu, V., Morrow, M., Van Zee, K. J., & Cody, H. S., III. (2024). Management of ipsilateral breast tumor recurrence following breast conservation surgery for ductal carcinoma in situ: A data-poor zone. Annals of Surgical Oncology. Advance online publication. https://doi.org/10.1245/s10434-024-16133-8

Type of article: Retrospective cohort study

Abstract:
Background: Breast conserving surgery (BCS) is well established for the management of ductal carcinoma in situ (DCIS), but neither randomized trials nor guidelines address management of ipsilateral breast tumor recurrence (IBTR) after BCS for DCIS.

Patients and methods: We identified women treated with BCS for DCIS who developed IBTR as a first event. Between those treated with mastectomy versus re-BCS, we compare the clinicopathologic characteristics, the use of adjuvant radiotherapy (RT) both upfront ("primary RT") and post IBTR ("secondary RT"), of tamoxifen, the rate of third events (local, regional, distant), and both breast cancer specific (BCSS) and overall survival (OS).

Results: Of 3001 women treated with BCS for DCIS (1978-2010), 383 developed an IBTR as a first event (1983-2023) and were treated by mastectomy (51%) versus re-BCS (49%). Compared with re-BCS, mastectomy patients at initial treatment were higher grade (74% versus 59%, $p = 0.004$), with more frequent primary RT (61% versus 21%, $p < 0.001$). Third local events were more frequent for re-BCS than mastectomy (16% versus 3%, $p = 0.001$), but there were no differences in breast cancer specific or overall survival.

Conclusions: For isolated IBTR following BCS for DCIS and treated by mastectomy versus re-BCS (1) mastectomy was associated with less favorable initial pathology and more frequent use of primary RT, (2) re- recurrence was more frequent with re-BCS, and (3) BCSS and OS were comparable. Our data suggest a wider role for re-BCS and further study of the relationship between secondary RT and the rate of third breast events.

Keywords: Breast conservation surgery; DCIS; Ipsilateral breast tumor recurrence; Re-conservation surgery.

Key points:

- The study included 383 women with ipsilateral breast tumor recurrence (IBTR) after initial breast-conserving surgery for DCIS, with 197 treated by mastectomy and 186 treated by repeat breast-conserving surgery
- Patients treated with repeat breast-conserving surgery had a higher rate of third local recurrence than those treated with mastectomy
    - Despite the higher recurrence rate, there was no significant difference in breast cancer-specific survival or overall survival
- Among those undergoing repeat breast-conserving surgery, those who received both primary and secondary radiation therapy had the lowest recurrence rate

I chose this article because it directly compares mastectomy vs repeat breast-conserving surgery in patients with repeat breast tumor after prior breast-conserving treatment, which is relevant to my PICO question. Additionally, it is one of the most recent studies (2024) and evaluates important outcomes including local recurrence, breast cancer-specific survival, and overall survival. The finings demonstrates that although mastectomy reduces the risk of another local recurrence, repeat breast-conserving surgery may offer similar long-term survival outcomes.

What is the clinical "bottom line" derived from these articles in answer to your question?
Based on the evidence from the 4 articles, mastectomy provides the strongest local control for patients with ipsilateral breast tumor recurrence after prior breast-conserving surgery, but repeat breast-conserving surgery/lumpectomy may be a reasonable alternative in carefully selected patients. The article from Mo et al. found that repeat breast-conserving surgery was associated with a higher rate of second local recurrence compared with salvage mastectomy, but there was no significant difference in distant metastasis or overall survival. Li et al. similarly found no statistically significant difference in overall survival or breast cancer-specific survival between repeat breast-conserving surgery and mastectomy in patients with DCIS and ipsilateral breast tumor recurrence, with improved outcomes when repeat surgery was combined with radiation therapy. ElSherif et al. found that repeat lumpectomy with re-irradiation had similar disease-free and overall survival compared with salvage mastectomy, with fewer post-op complications. Diskin et al. found that repeat breast-conserving surgery had a higher local recurrence rate than mastectomy, but breast cancer-specific survival and overall survival were comparable.

For the patient from my PICO, mastectomy appears to be the best option for reducing the risk of another local recurrence, especially because she already had prior right breast lumpectomy and radiation. However, the evidence does not show a clear survival advantage with mastectomy over lumpectomy in carefully selected patients, therefore the decision should involve shared decision making including tumor size, ability to receive re-irradiation, cosmetic concerns, and patient preference.

Mastectomy vs lumpectomy is generally applicable to underserved urban populations, but patients may face barriers such as limited access to breast oncology specialists, radiation oncology, reconstruction services, insurance coverage, transportation, and follow-up care. Health literacy may also affect how well a patient understands the difference between "lower recurrence risk" and 'improved survival." Because of these factors, the clinical bottom line should be adjusted to emphasize patient-centered counseling. For underserved urban populations, clinicians should use clear language, assess understanding, address financial barriers, and involve patient navigators when needed to ensure the patient has enough time and support to make an informed decision.