



Updates in Surgical Management for Breast Cancer
June 26

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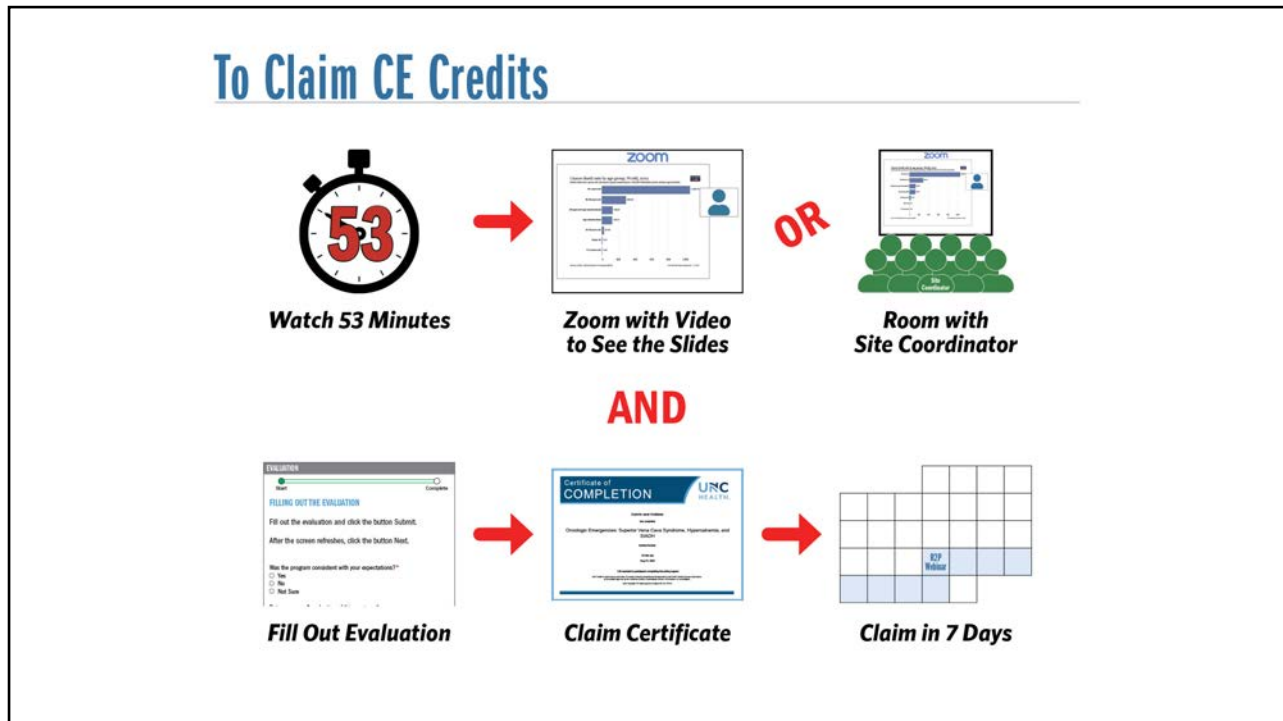
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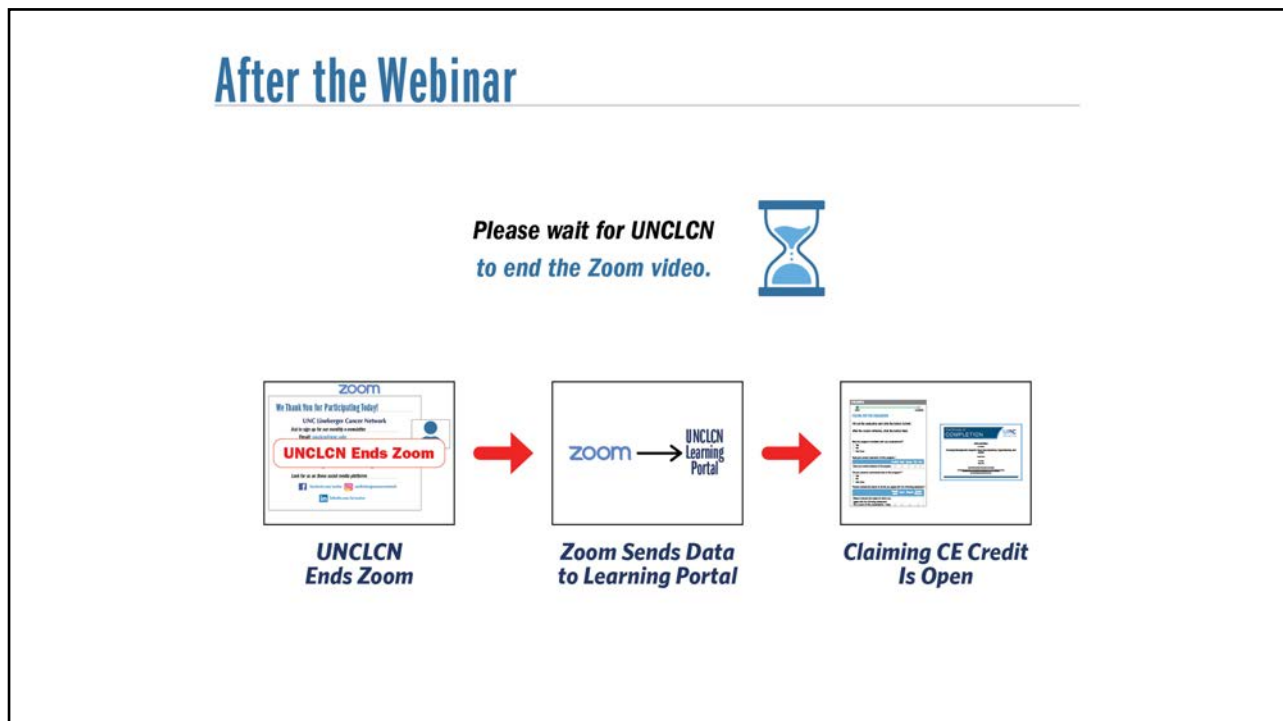


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Our Presenter



Kristalyn Gallagher,
DO, FACS, FACS

Kristalyn Gallagher, DO, FACS, FACS, is a Breast Surgical Oncologist, Associate Professor of Surgery, and the Chief of breast surgery at the University of North Carolina in Chapel Hill.

Nationally, she serves as the Vice Chair for the Association of Women Surgeons Foundation and the Chair of the American Society of Breast Surgeons Candidate Education Committee.

She is dedicated to empowering and supporting women surgeons and teaching and training future surgeons. Her research interests include clinical trials, developing new innovative surgical techniques, and personalizing breast cancer treatment options.

Dr. Gallagher is also dedicated to patient care and is a committed educator for students, residents, and fellows.

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Our Presenter

9

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- 5.** Kristalyn Gallagher, DO, FACS, FACS, is a co-PI for a national clinical trial to reduce the incidence of lymphedema for patients undergoing lymph node surgery.

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4. She was awarded the best abstract in 2019 by the Association for Academic Surgery.

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2. She is a surgical coach and helps train other surgeons nationally in oncoplastic surgical techniques.

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2. She is a surgical coach and helps train other surgeons nationally in oncoplastic surgical techniques.
1. She is trained in oncoplastic surgery so every surgery she attempts to hide scars and rearrange tissues to make things look as natural as possible.

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Sample Poll Everywhere Question

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Breast cancer surgery is a common treatment that can involve removing the cancer, removing lymph nodes, or reconstructing the breast.

(A) True 0%

(B) False 0%

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Breast cancer surgery is a common treatment that can involve removing the cancer, removing lymph nodes, or reconstructing the breast.

True	0%
False	0%

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Updates in the Surgical Management of Breast Cancer

June 26, 2024

Kristalyn Gallagher, DO, FACOS, FACS

- Breast Surgical Oncology & Oncoplastic Surgery
- Associate Professor of Surgery at UNC, Chapel Hill
- Chief, Breast Surgery
- Director, UNC Surgical Breast Program







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No Relevant Disclosures

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Objectives

-  Discuss surgical management of the breast
-  Review current guidelines and considerations for the management of the axilla
-  Review surgical approach to minimize lymphedema
-  Future directions

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Surgical Management of the Breast

- Breast Conservation
- Mastectomy
- Oncoplastic Techniques

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A diagram illustrating the evolution of breast cancer treatment. It consists of three circular panels on a dark purple background. The first panel shows a black and white illustration of a radical mastectomy. The second panel shows a cross-section of a breast with a tumor and arrows indicating the removal of the tumor and surrounding tissue. The third panel shows a breast with a small tumor and arrows indicating the removal of the tumor while preserving the breast tissue.

1894: Radical Mastectomy
American Surgical Association awarded "Gold Standard" status in 1898

1971: Modified Radical Mastectomy
NSABP B04

1977: Breast Conservation
NSABP B06

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RTC Comparing Local Recurrence Rates After BCT with/without XRT

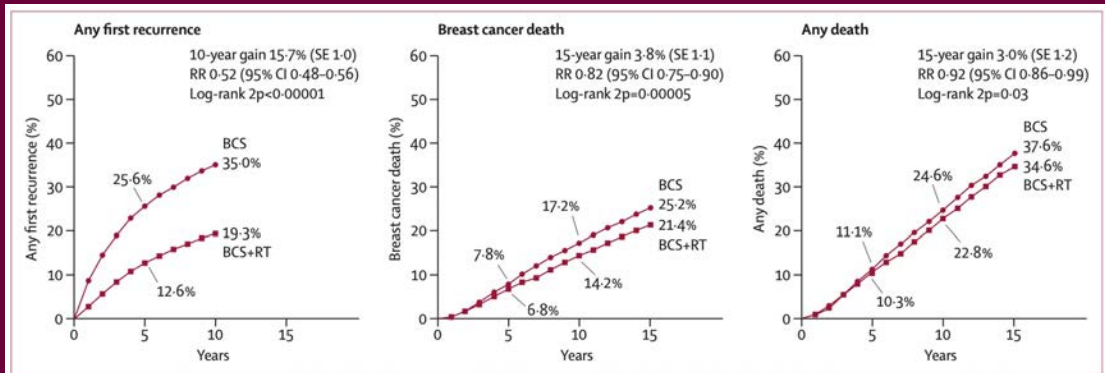


Figure 1: Effect of radiotherapy (RT) after breast-conserving surgery (BCS) on 10-year risk of any (locoregional or distant) first recurrence and on 15-year risks of breast cancer death and death from any cause in 10 801 women (67% with pathologically node-negative disease) in 17 trials. Further details are in webappendix p 5. RR=rate ratio. Rate ratios in this figure include all available years of follow-up.

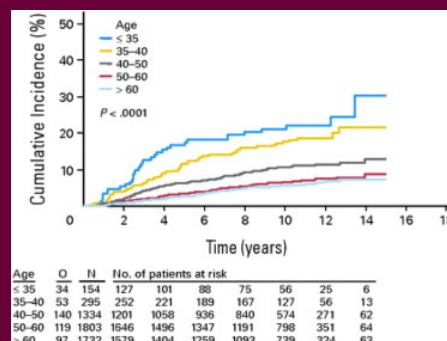
Years 1976-1999

EBCTCG meta-analysis. Lancet 2011

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Modern LRR Risk after BCT

- Modern series showed that with multimodal management of early-stage breast cancer resulted in a much lower **5-15%** (compared to 19-35%) ipsilateral breast tumor recurrence (IBTR)^{1,2,3}
- Several factors associated with risk of IBTR^{1,2,3,4}
 - Age at diagnosis
 - Tumor grade (high grade)
 - Receptor Status (TNBC, HER2+)
 - EIC
 - Adjuvant therapy (RT, ET, Chemo, Targeted tx)



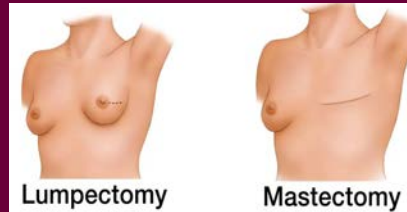
¹Brewster et al. JNCI 2008, ²Bosma et al. BCRT 2016, ³Vrieling et al. JAMA Onc 2017, ⁴van der Leij et al. Semin Radiat Onc 2012.

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Which is Better: Lumpectomy or Mastectomy?

Traditionally

- Lumpectomy = Mastectomy in terms of overall survival (OS)
- Mastectomy had a lower risk of local-regional recurrence (LRR)



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Overview

- Retrospective review of a prospectively maintained database
- 2006-2016
- cT1-3, cN0-3 breast cancer
- Excluded
 - Women >70 yo (d/t possible omission of XRT with BCS)
 - Bilateral breast cancer
 - Multiple synchronous ipsilateral cancers
 - Neoadjuvant chemotherapy
 - BCS alone
 - De novo stage IV disease
- N=13,914 (BCS: 8,228 and Mastectomy: 5,686)

Vasilyeva et al. Ann Surg Oncol 2023

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BCT Resulted in Better OS Than Mx

Multivariate analysis

ALL: HR 1.37, p<0.001

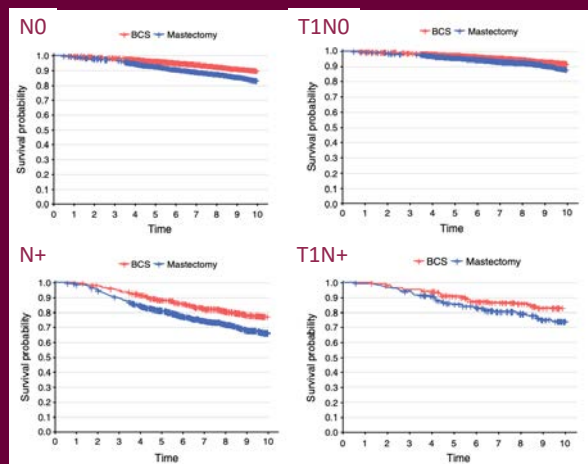
N+: HR 1.46, p=0.002

Mastectomy was associated with an increased risk of death

cN0: HR 1.49, 95% CI 1.27-1.74, p<0.001

cN+: HR 1.59, 95% CI 0.99-2.57, p=0.055

NS



Vasilyeva et al. Ann Surg Oncol 2023, H Pass Best Papers of 2023 ASBrS 2024 Annual Meeting

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BCT Resulted in Improved BCSS

Multivariate analysis

ALL: HR 1.32, $p < 0.001$

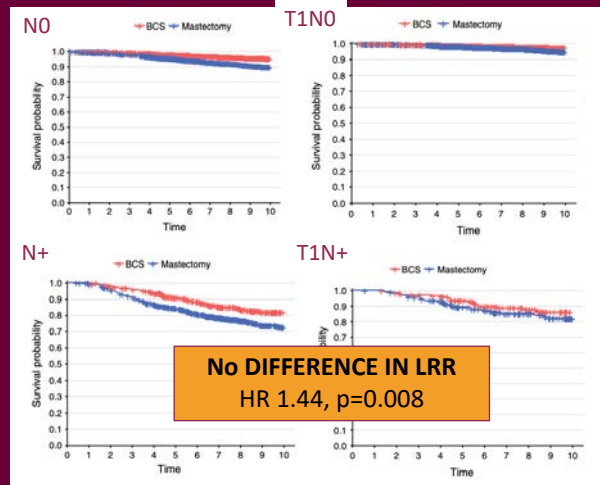
N+: HR 1.44, $p = 0.008$

Mastectomy was associated with an increased risk of death from breast cancer

cN0: HR 1.60, 95% CI 1.23-2.09, $p < 0.001$

cN+: HR 1.47, 95% CI 0.85-2.57, $p = 0.2$

NS



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T1 Patients: Surgical Overtreatment?

- Should be amenable to BCS
- In this series, 50% of T1N+ and 30.5% pts had a Mastectomy
- BCSS and OS favored BCS
- No difference in local control
- Important to counsel LRR still possible after a Mastectomy

Conclusion:

- In an era of contemporary systemic treatment, BCT was associated with better BCSS and OS and equivalent LRR compared to mastectomy

Vasilyeva et al. Ann Surg Oncol 2023, H Pass Best Papers of 2023 ASBrS 2024 Annual Meeting

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Integrating These Findings into Everyday Practice

- The seminal RCT demonstrated that BCT was equivalent to mastectomy but had an increased incidence of local recurrence – old data
- Multiple recent studies have shown that BCT improves survival including
 - Young patients
 - High-risk tumors
 - N0 and N+ cohorts

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Integrating These Findings into Everyday Practice

- Possible Explanations (survival)
 - Mastectomy induces a larger inflammatory response
 - Mastectomy may delay the initiation of adjuvant treatment
- Possible Explanations (LRR)
 - Better diagnostic imaging delineating extent of disease
 - Better margin assessment
 - More precise XRT
 - Significantly improved systemic treatment
- Again demonstrates that tumor biology and not the extent of surgery is important
- It's time to update our counseling!

Vasilyeva et al. Ann Surg Oncol 2023, H Pass Best Papers of 2023 ASBrS 2024 Annual Meeting

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Is Radiation Necessary for ALL Patients Undergoing BCT?

The slide features a dark maroon background. On the left, the text 'Is Radiation Necessary for ALL Patients Undergoing BCT?' is displayed in white. To the right, there is a composite image. The top portion shows a radiation therapy machine (linear accelerator) with a patient lying on a table, and a CT scan of a chest with a red area highlighting a tumor. Below this, the bottom half of the slide is divided into two decorative panels: the left panel contains a circular pattern of small white dashes, and the right panel contains a stylized white flower graphic.

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Radiation

- The addition of RT reduces the risk of LRR by half and cancer death rates by a sixth.
- Breast cancer is a heterogeneous disease, and absolute benefit varies for individual patients

- Side Effects:

- Breast pain
- Fibrosis
- Increased cardiac mortality
- Lymphedema
- Poorer cosmetic result
- Low risk of radiation-induced sarcoma



- Are there patients who are unlikely to benefit from RT and avoid morbidity and cost?

BH Chua. *The Breast*. 2024.

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RCTs defining low-risk patient subgroups

Randomised trials of radiation therapy after breast conserving surgery for early breast cancer.

	Years	No. Of patients	Age (years)	Median follow-up (years)	Local recurrence (%)	
					ET ^a	ET ^a + RT ^b
Kunkler et al. [10]	2003-2009	1326	≥65	9.1	9.5	0.9
Hughes et al. [11]	1994-1999	636	≥70	12.6	10.0	2.0
Blamey et al. [12]	1992-2000	1172	<70	10.2	4.8	1.1
Fastner et al. [13]	1996-2004	869	Postmenopausal	9.9	7.6	2.5
Fyles et al. [14]	1992-2000	769	>50	5.6	7.7	0.6
Fisher et al. [15]	1989-1998	1009	≥18	8.0	16.5	2.8
Winzer et al. [16]	1991-1998	347	>45-75	9.9	20.0	6.0
Forrest et al. [17]	1985-1991	585	<70	5.7	24.5	5.8

^a ET, endocrine therapy.
^b RT, radiation therapy.

BH Chua. *The Breast*. 2024.

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Landmark Trials Looking at Possible Omission of RT for early-stage BCT

CALGB
9343

PRIME II

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CALGB 9343

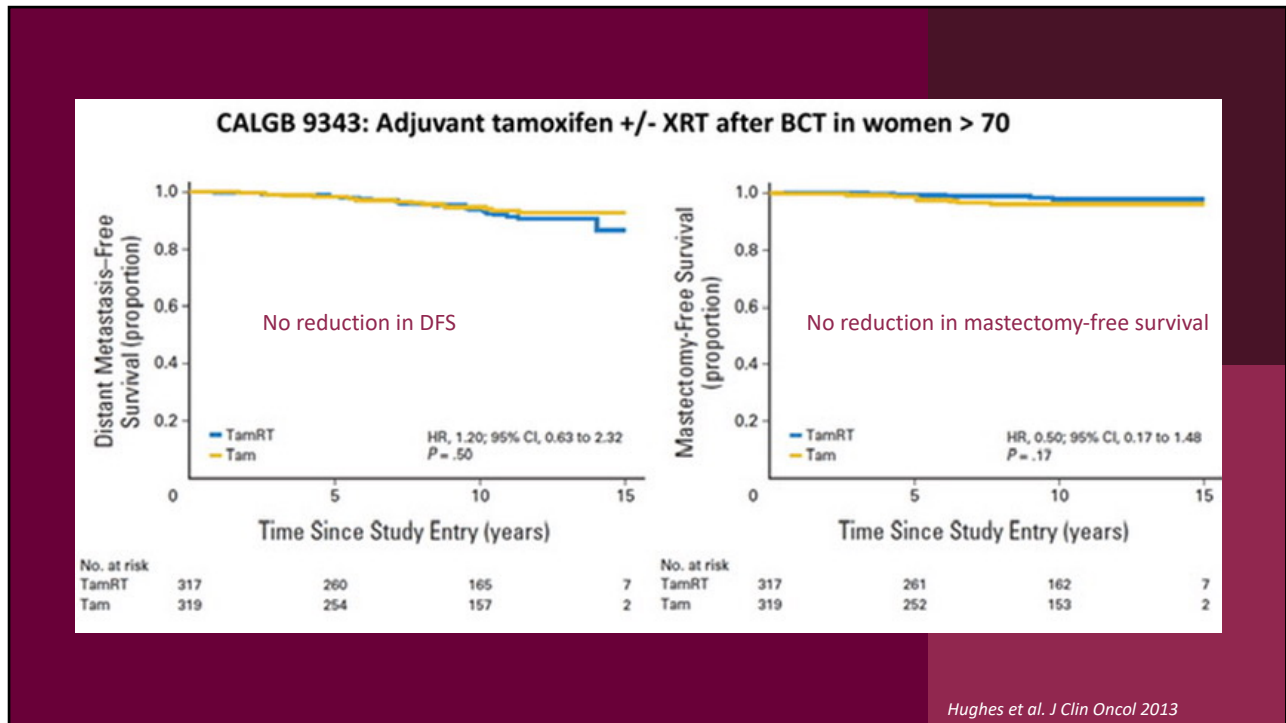
- RCT including 647 patients from 1994-1999
- Inclusion:
 - >70 yo
 - ER+
 - Clinical Stage I (T1 N0)
- Randomized to Tam + RT or Tam Alone
- Median follow up: 12.6 yrs

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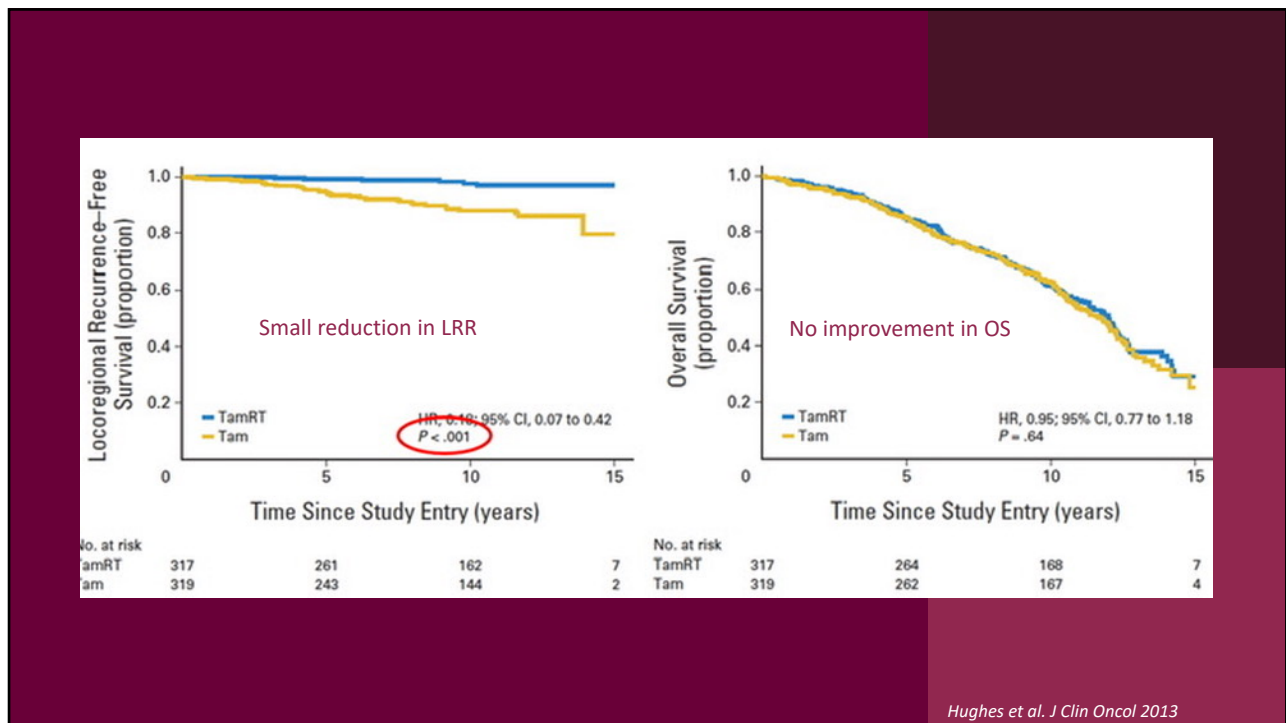
            graph TD
            A[Enrollment (N = 647)] --> B[Random assignment (n = 636)]
            A --> C[Excluded (n = 11)]
            C --> C1[Did not meet inclusion criteria (n = 4)]
            C --> C2[Other reasons; unknown (n = 7)]
            B --> D[Allocated to TamRT (n = 317)]
            B --> E[Allocated to Tam (n = 319)]
            D --> F[Analyzed (n = 317)]
            E --> G[Analyzed (n = 319)]
            
```

Hughes et al. J Clin Oncol 2013

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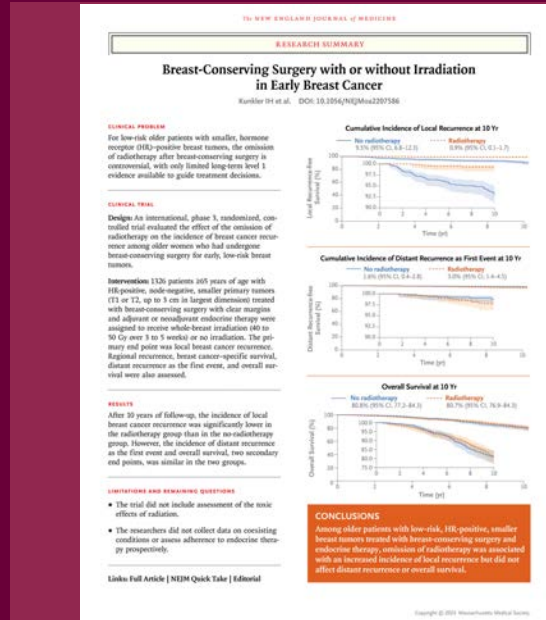


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PRIME II

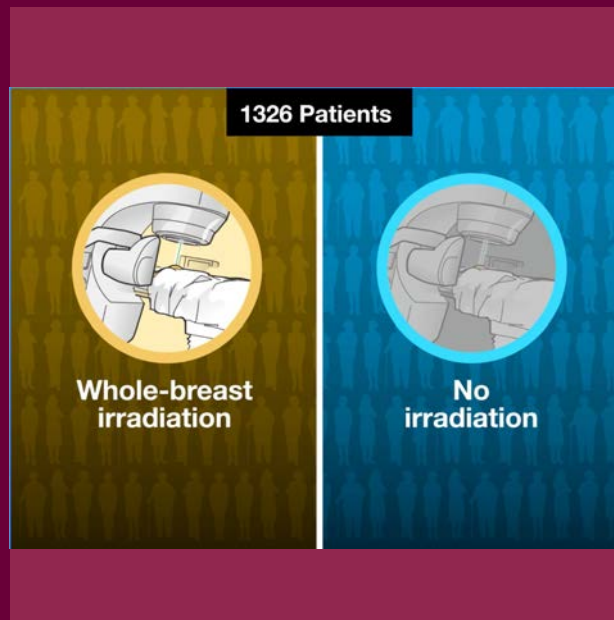


Kunkler et al. NEJM 2023. DOI: 10.1056/NEJMoa2207586.

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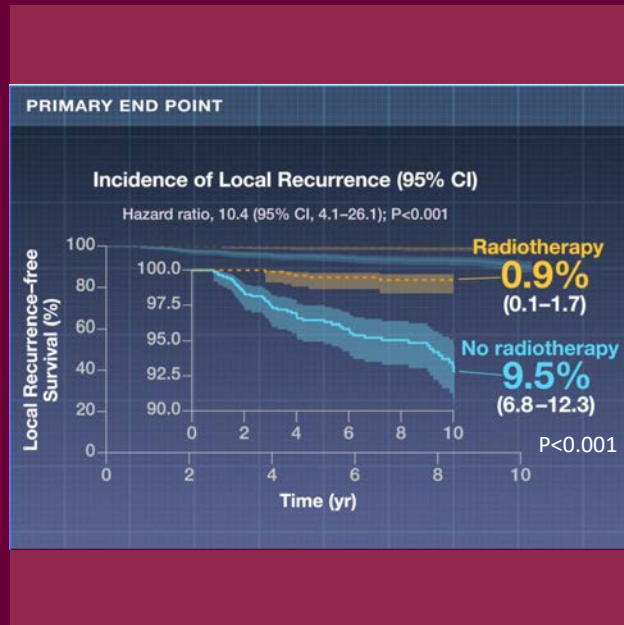
- 1326 patients from 2003-2009
- Inclusion Criteria:
 - >65 yo
 - T1 or T2 (≤3cm)
 - BCT
 - Clear Margins
 - Planned ET
- Randomized to WBRT or no RT
- Median f/up 9.1 yrs



Kunkler et al. NEJM 2023. DOI: 10.1056/NEJMoa2207586.

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PRIME II

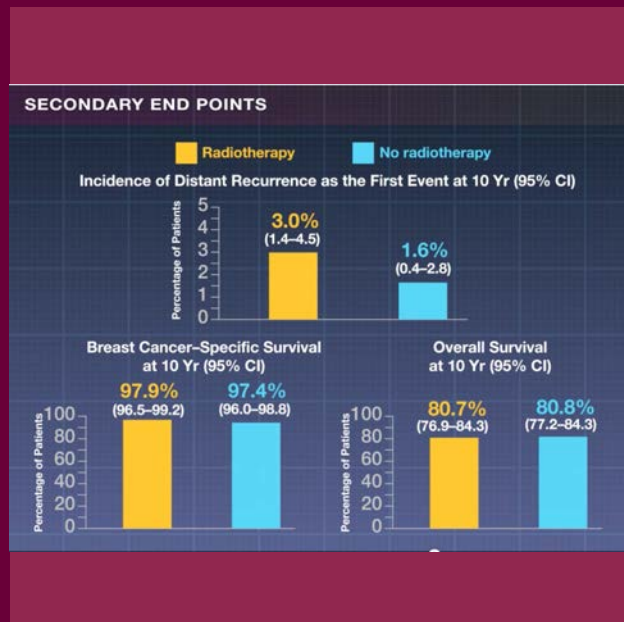


Kunkler et al. NEJM 2023. DOI: 10.1056/NEJMoa2207586.

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PRIME II

- The investigators concluded, “Omission of radiotherapy was associated with an increased incidence of local recurrence but had no detrimental effect on distant recurrence as the first event or overall survival among [patients] 65 years of age or older with low-risk, hormone receptor-positive early breast cancer.”



Kunkler et al. NEJM 2023. DOI: 10.1056/NEJMoa2207586.

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Improving Prognostic Precision


Study	Accrual target	Age (years)	Tumour characteristics (TNM, grade 1 or 2, ER, PR positive, HER2-negative)	Design
LUMINA NCT01791829 [16] Canada	500	≥55	Luminal A subtype ER > 1%, PgR >20%, HER2-negative, Ki67 < 13.25 %; excision margins >1 mm	Prospective cohort non-randomised
PRIME1™ IBRCTN 41579286 [17] United Kingdom	1550	≥60	Very low risk BRCA1-C, excision margins ≥1 mm	Prospective cohort non-randomised
DEA NCT02480190 [18] United States	202	50-69	Oncotype DX Recurrence Score ≤18; grade 3 included; excision margins >2 mm	Prospective cohort non-randomised
PRECISION [®] NCT02653755 [19] United States	600	50-75	PAM50 luminal A subtype, low risk Risk of recurrence score); microscopically negative margins or no residual disease on re-excision	Phase II prospective cohort non-randomised
EXPERT [™] NCT02868674 [20] Australia and international	1170	≥50	PAM50 luminal A subtype and Risk of Recurrence score ≤16); microscopically negative margins or no residual disease on re-excision	Randomised controlled trial (whole breast RT and endocrine therapy vs endocrine therapy only)
DEBRA [®] NCT04852887 [21] United States	1670	50-69	Oncotype DX Recurrence Score ≤18; negative margins (no ink on tumour)	Randomised controlled trial (whole or partial breast RT and endocrine therapy vs endocrine therapy only)
EURORA [®] NCT04134598 [22] Italy	926	≥70	Luminal A subtype ER > 10%, PgR >20%, HER2-negative, Ki67 < 20 %; negative margins (no ink on tumour); grade 3 permitted if pT ≤ 10 mm	Randomised controlled trial (partial breast RT only vs endocrine therapy only)

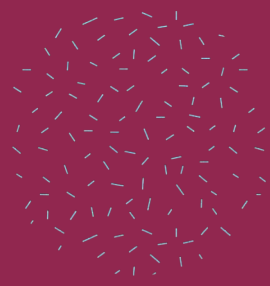
BH Chua. The Breast. 2024.

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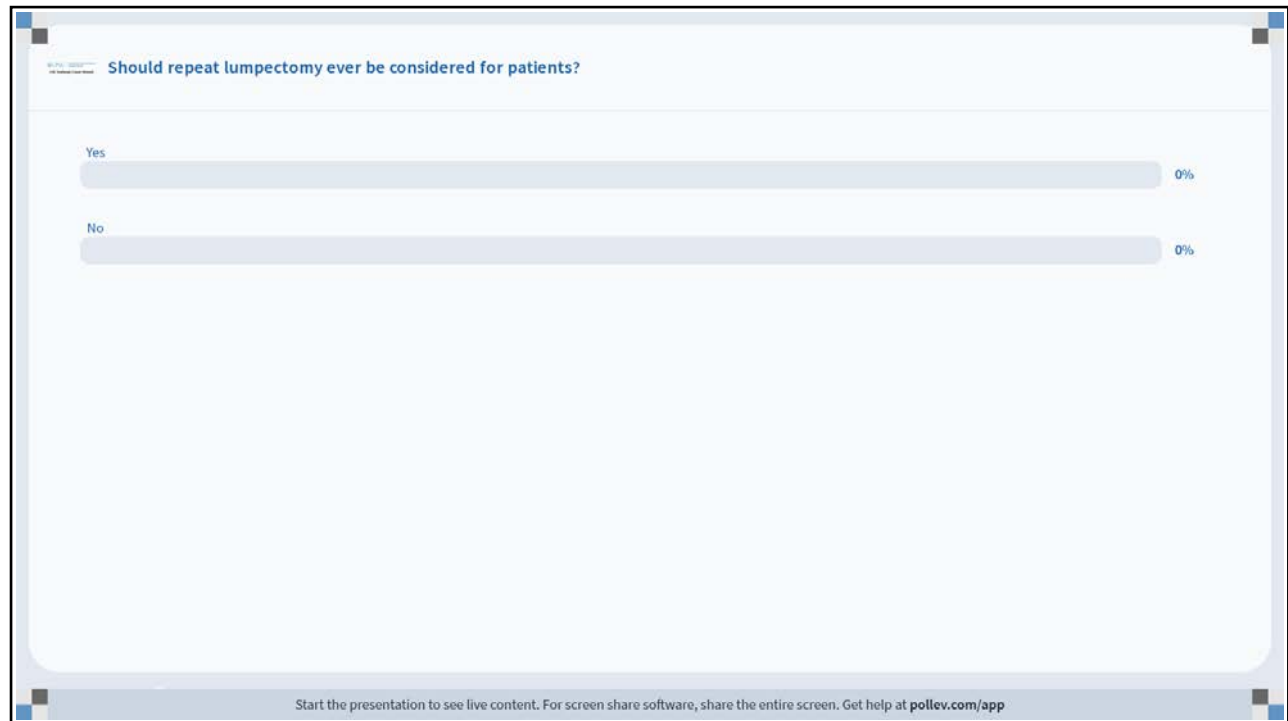
CAMERAN Trial at UNC

- Investigating which is better? APBI or ET
- PI: Dana Casey, MD
- Inclusion:
 - Age >65 yo
 - Low risk tumor (<3 cm, grade 1-2, Node negative, hormone receptor positive)
 - Patients randomized to APBI or ET





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Can you repeat a lumpectomy?

Historically

A meme featuring a man with a surprised expression and the text "ABSOLUTELY NOT" overlaid on the bottom.

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Current Evidence

- Mastectomy is no longer consider absolutely “obligatory” for IBTR
- Consider for:
 - Low risk (small, luminal A)
 - When RT may not be required
- Re-do lumpectomy + Repeat RT when IBTR > 5 years after primary treatment
- Panel 50/50 for re-do lumpectomy when repeat RT was not an option



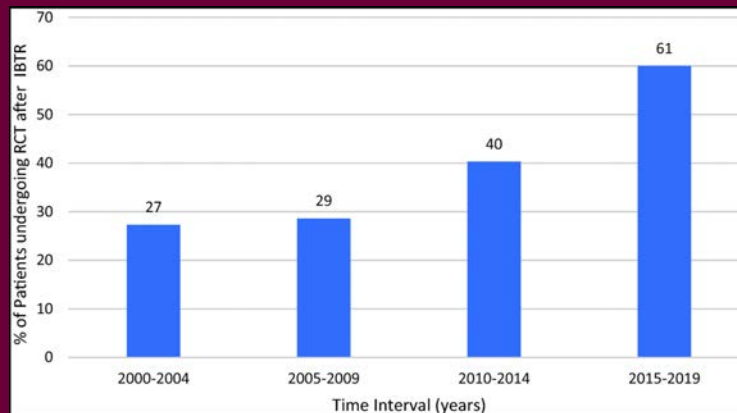
Burstein et al. Ann Oncol 2021

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Management of ipsilateral breast tumor recurrence following breast conservation surgery: a comparative study of re-conservation vs mastectomy

Astrid Boty Van den Bruele¹ · Ishita Chen² · Varadan Sevilimedu³ · Tiana Le¹ · Monica Morrow¹ · Lior Z. Braunstein² · Hiram S. Cody III¹



Van Den Bruele et al. BCRT 2021

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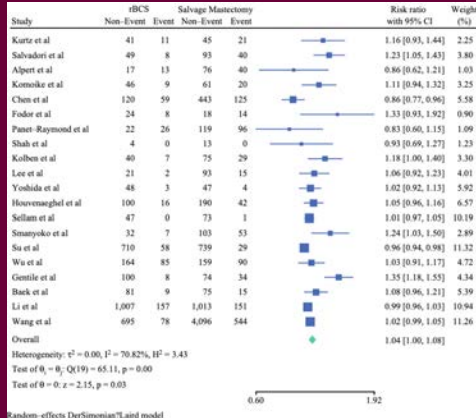
Meta-Analysis

Ann Surg Oncol (2022) 29:6440–6453
<https://doi.org/10.1245/s10434-022-12191-6>

ORIGINAL ARTICLE – BREAST ONCOLOGY

A Systematic Review and Meta-Analysis on the Role of Repeat Breast-Conserving Surgery for the Management of Ipsilateral Breast Cancer Recurrence

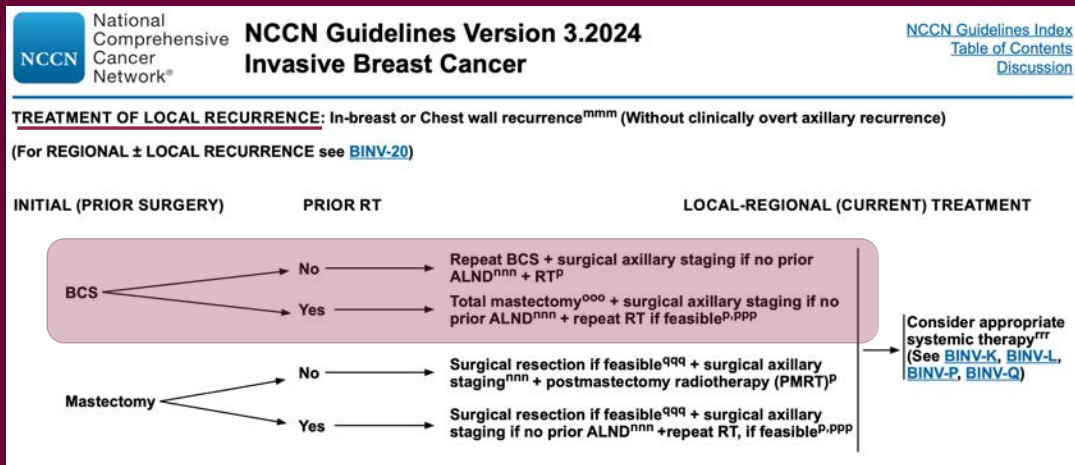
Chae Josephine Tollan, MD¹, Eritri Panfiliou, MD², Antonios Valachis, MD³, Andreas Karakatsani, MD, PhD, FRCR⁴, and Maria Konstantinou Tsoulfa, MD, PhD, FRCR⁵*



- 42 observational studies
- Second LR rate
 - After rBCS: **15.7%**
 - After salvage mastectomy: **10.3%**
 - Risk ratio: 2.103 (95% CI 1.535-2.883; $p < 0.001$)
- Repeat RT had a protective effect for second LR
- Pooled 5 yr OS
 - rBCS: 86.8%
 - Salvage mastectomy: 79.8%
- Conclusion: rBCS could be considered for IBTR. Shared decision making, appropriate patient selection and individualized approach are important for optimal outcomes.

Tollan CJ et al. Ann Surg Oncol. 2022;29(10):6440-6453.

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NCCN, Version 6.2024.

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Oncoplastic Surgery


Improving Cosmetic Outcomes



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Oncoplastic Surgery

When cancer surgery (oncologic surgery) and plastic reconstructive surgery are combined in a single operation



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Purpose

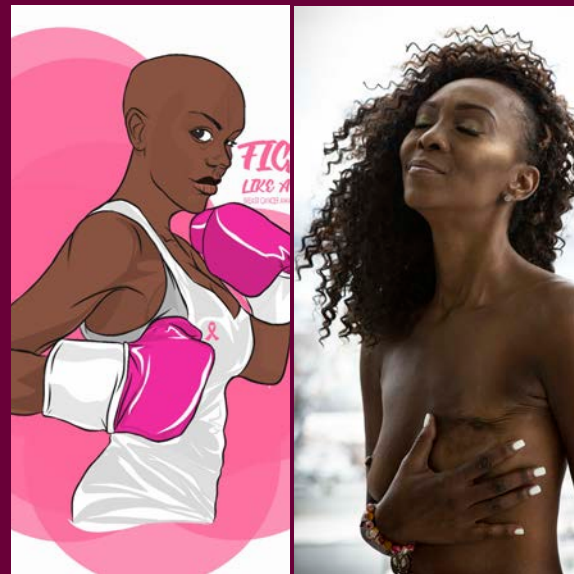
- Remove the cancer and reshape the breast into a normal appearing breast



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Why is Oncoplastic Surgery Important?

- BCT is the standard of care in management of early-stage breast cancer
- Goal of BCT is tumor-free resection margins and local control
- Secondary goal: satisfactory cosmetic outcome
- Cosmetic outcomes are associated with patient satisfaction and improved QOL
 - Poor outcomes affect up to 40% patients undergoing BCT
 - Direct correlation between cosmetic outcome and patient's anxiety and depression score, body image, sexuality and self-esteem.¹



Cochrane RA et al. Br J Surg. 2003;90(12):1505-1509.

60

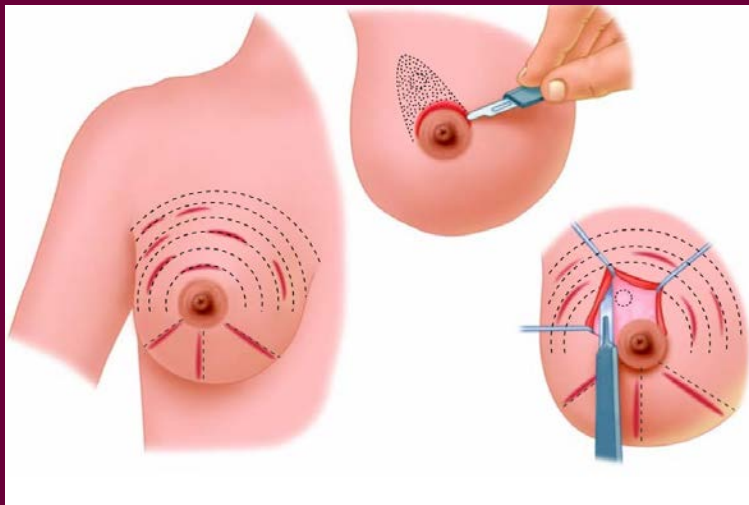


Factors influencing cosmesis

- Surgery
 - Incision placement
 - Amount/Volume of tissue excised
 - Tissue rearrangement
 - Tumor location
- Adjuvant treatment
 - Radiation
 - Systemic therapies

Cochrane RA et al. Br J Surg. 2003;90(12):1505-1509.

61



Incision Placement

- Periareolar
- Inframammary fold
- Curvilinear in the superior pole of the breast
- Parallelogram if you need to remove skin
- Radial in the inferior pole of the breast
- Try to avoid the V-line

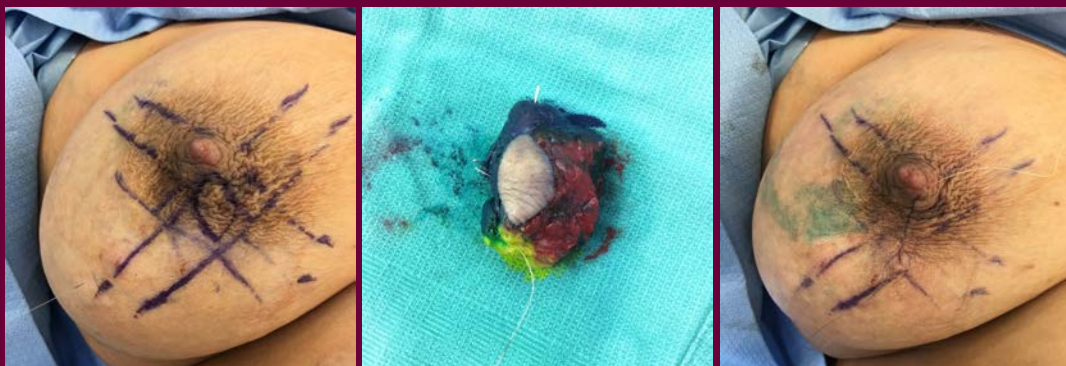
62



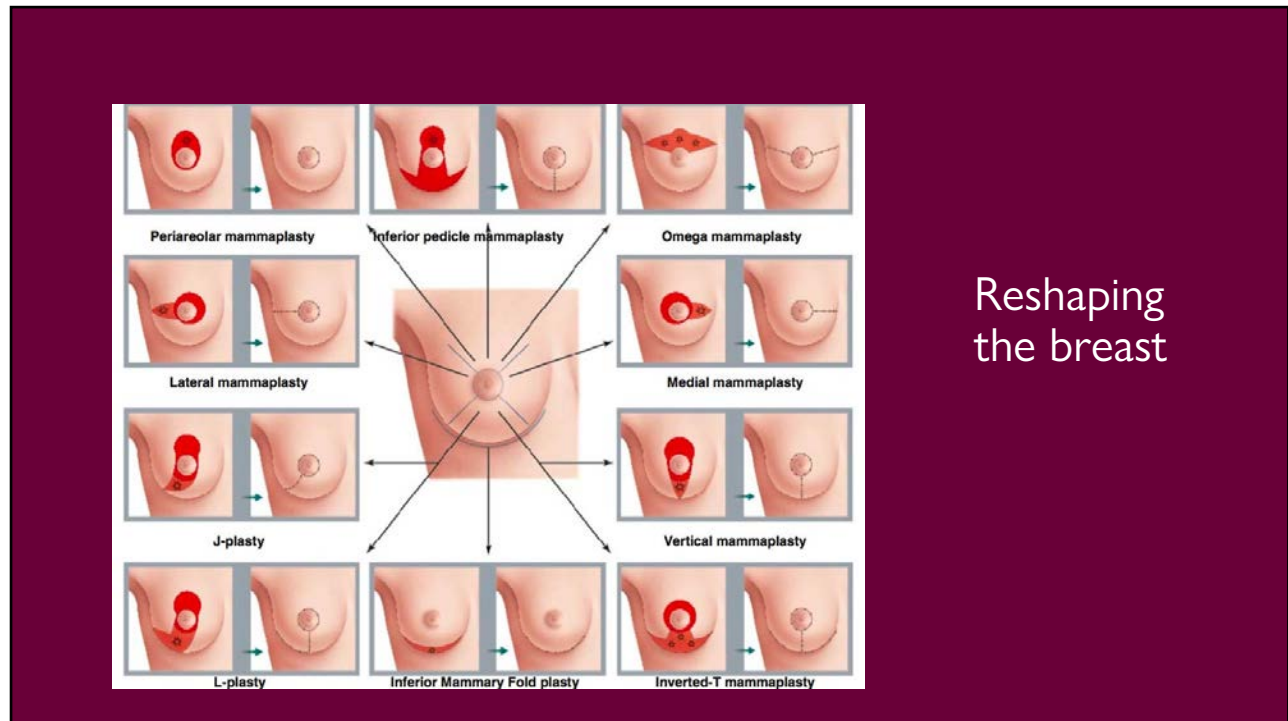
Incision placement

63

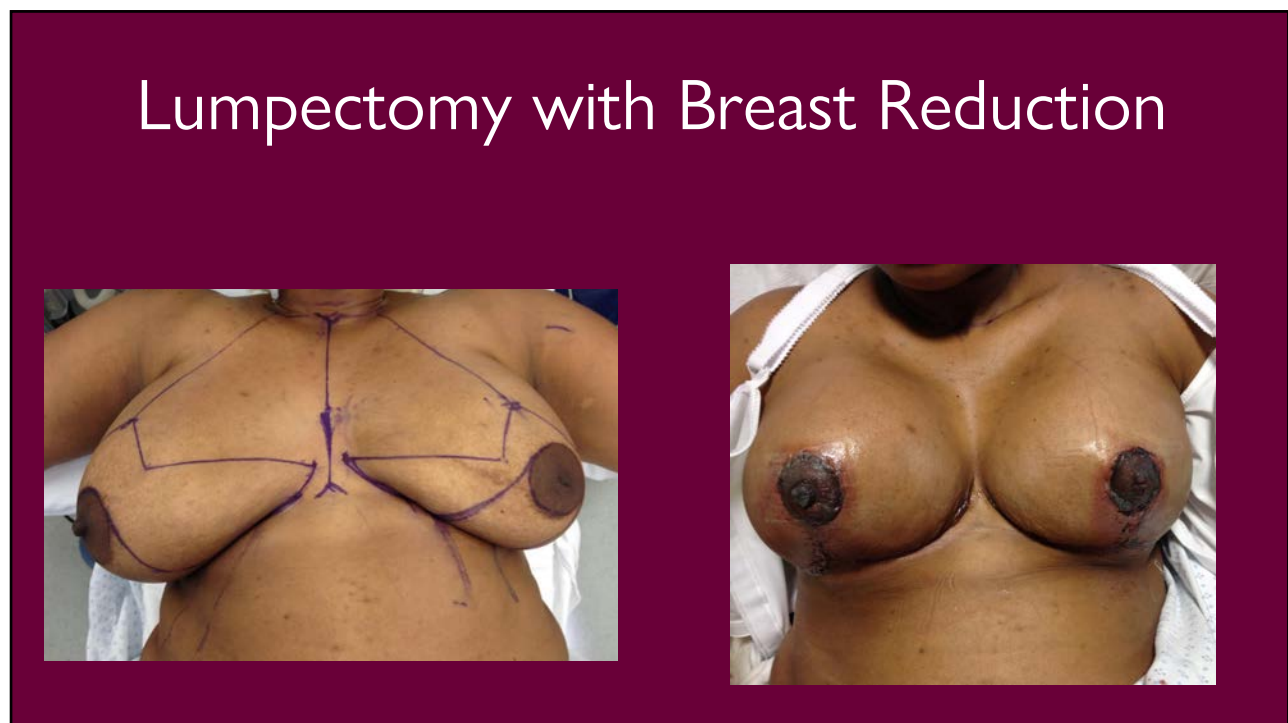
Radial incision within the areola



64



65



66

Oncoplastic Mastopexy



67

The
aesthetically
flat closure



68

Why go flat?

- Avoid additional surgeries
- Minimize surgery time
- Not wanting foreign body (BIA-ALCL) or extended healing with autologous reconstruction
- Lower risk of complications
- Ability to not wear a shirt or a bra if desired

The decision to go flat or have reconstruction is a personal one.

Going flat does not mean patients are not interested in achieving an excellent aesthetic result

69

"Going Flat" After Mastectomy: PRO by Online Survey

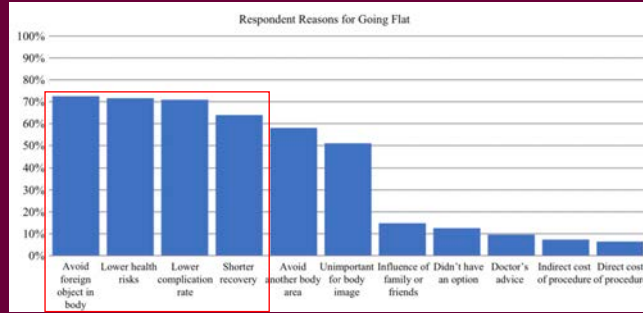
- 931 women with uni- or bilateral mastectomy for treatment of breast cancer or elevated breast cancer risk

Baker JL, Dizon DS... Attai DJ. "Going Flat After Mastectomy: Patient-Reported Outcomes by Online Survey. Ann Surg Onc 2021. 28:2493-2505. <https://doi.org/10.1245/s10434-020-09448-9>.

70

“Going Flat” After Mastectomy: PRO by Online Survey

- 931 women with uni- or bilateral mastectomy for treatment of breast cancer or elevated breast cancer risk
- The top two reasons for going flat were avoidance of a foreign body placement and a desire for a faster recovery



Baker JL, Dizon DS... Attai DJ. “Going Flat After Mastectomy: Patient-Reported Outcomes by Online Survey. *Ann Surg Onc* 2021. 28:2493-2505. <https://doi.org/10.1245/s10434-020-09448-9>.

71

“Going Flat” After Mastectomy: PRO by Online Survey

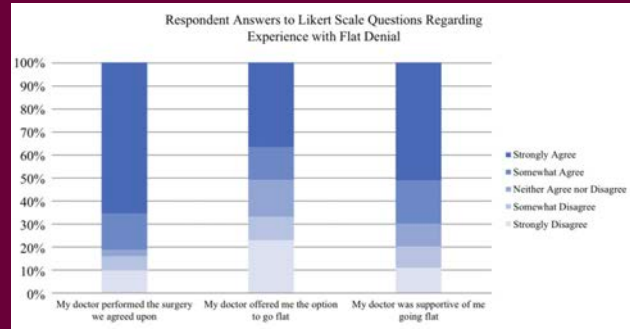
- 931 women with uni or bilateral mastectomy for treatment of breast cancer or elevated breast cancer risk
- The top two reasons for going flat were avoidance of a foreign body placement and a desire for a faster recovery
- 65% of respondents felt they received adequate information about surgical options so they could make the right decision
- 20.7% of respondents felt that their surgeon did not respect or support their decision to go flat

Baker JL, Dizon DS... Attai DJ. “Going Flat After Mastectomy: Patient-Reported Outcomes by Online Survey. *Ann Surg Onc* 2021. 28:2493-2505. <https://doi.org/10.1245/s10434-020-09448-9>.

72

“Going Flat” After Mastectomy: PRO by Online Survey

- In a multivariate analysis, **low level of surgeon support** for the decision to go flat was the strongest predictor of low satisfaction score
- Greater satisfaction was associated with receiving adequate information about surgical options

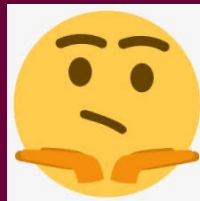


Baker JL, Dizon DS... Attai DJ. “Going Flat After Mastectomy: Patient-Reported Outcomes by Online Survey. *Ann Surg Onc* 2021. 28:2493-2505. <https://doi.org/10.1245/s10434-020-09448-9>.

73

Conclusion

- Most patients undergoing mastectomy alone are satisfied with their surgical outcome
- Surgeons may optimize patient experience by recognizing and supporting a patient’s decision to go flat

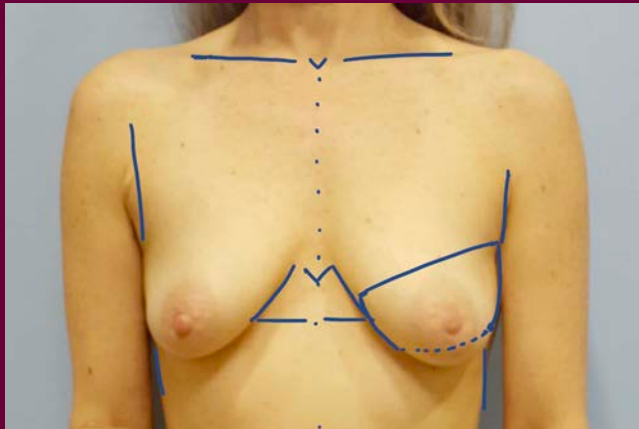


“I was never given the choice of going flat. It was like I was expected to have reconstruction”

“I stated multiple times I intended to stay flat...after surgery they told me they left extra skin in case I changed my mind”

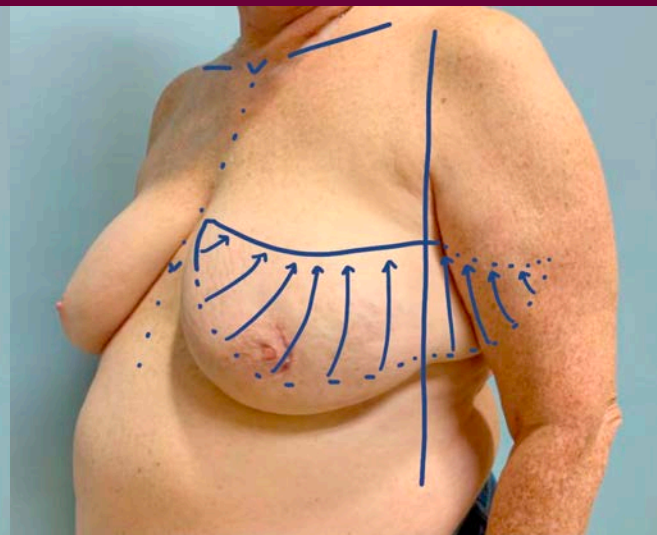
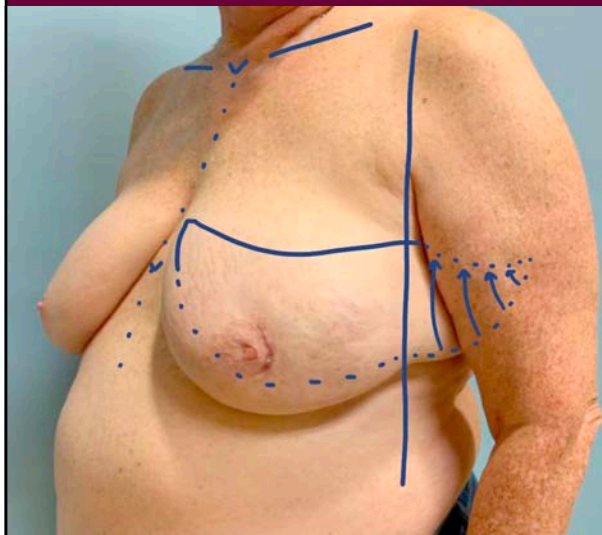
74

Flat Mastectomy in Small Breast



75

Angel Wing Technique



76

Angel Wing Technique



77

Skin Sparing Mastectomies



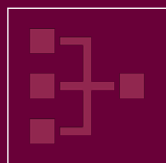
78

Nipple Sparing Mastectomies



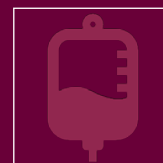
79

Surgical Management of the Axilla



Clinically Node Negative (cN0)

Pathological Node-Positive (pN+)



Clinically Node positive (cN+)

Down-stages to pN0 after chemotherapy
Still node-positive after chemotherapy

80

Poll Everywhere

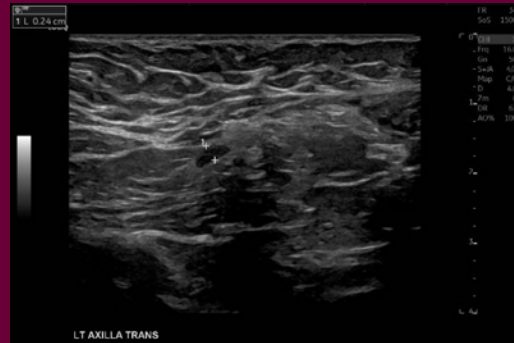
- You are seeing a 41 year old patient in your clinic who has a 2.5 cm invasive ductal carcinoma (IDC), grade 3, hormone receptor-positive (ER+, PR+) and HER2 receptor negative. She is planning breast conservation with a lumpectomy. On exam, you do not feel any axillary adenopathy.

81



82

Clinically Negative Axilla



83

Clinically Node Negative

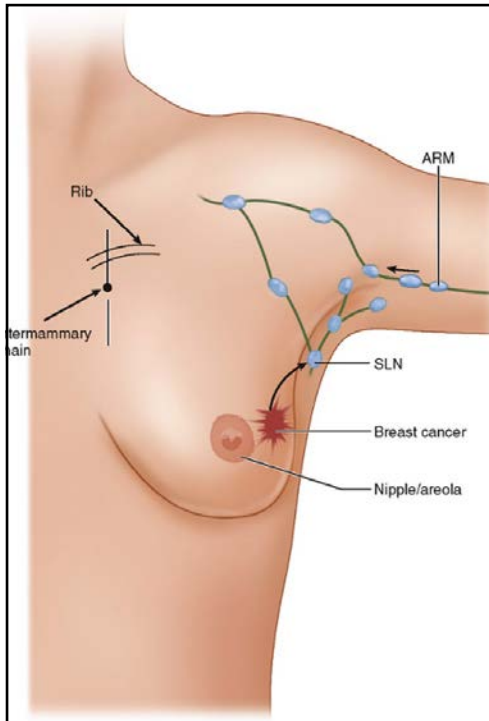
Sentinel lymph node excision

- Was SOC for many years for invasive cancer
- May help direct treatment recommendations

Omission of axillary surgery

- PRIME2 and CALGB 9343: RT omission. Can we consider omission of SLN for patients >70 yo with tumors <3 cm, favorable pathology and negative clinical exam
- SOUND trial: included any age, tumor <2 cm, favorable phenotype, negative axillary US

84



Axillary Management



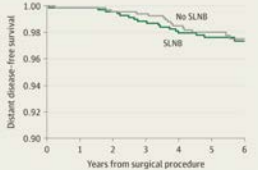

- 1996: Sentinel lymph node biopsy established as a standard method for axillary staging in clinically node-negative patients

85

Sound Trial

JAMA Oncology

RCT: Sentinel Lymph Node Biopsy vs No Axillary Procedure in Small Node-Negative Breast Cancer

<p>POPULATION 1463 Women</p>  <p>Adult women with breast cancer smaller than 2 cm and negative preoperative axillary ultrasound Median (IQR) age, 60 (52-68) y</p>	<p>INTERVENTION 1463 Patients randomized and analyzed</p>  <p>727 Sentinel node biopsy (SLNB) SLNB was performed (control group)</p> <p>736 No SLNB SLNB was omitted (experimental group)</p>	<p>FINDINGS Omission of SLNB was noninferior to SLNB in patients with breast cancer smaller than 2 cm and a negative ultrasound of the axillary lymph nodes</p> 
<p>SETTINGS / LOCATIONS  18 Hospitals in 4 countries</p>	<p>PRIMARY OUTCOME The protocol-specified primary end point was distant disease-free survival (DDFS) at 5 y</p>	<p>SLNB: 5-y DDFS, 97.7% No SLNB: 5-y DDFS, 98.0% (log-rank test, $P = .67$; hazard ratio, 0.84; 90% CI, 0.45-1.54; noninferiority $P = .02$)</p>

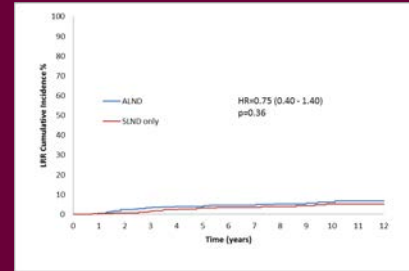
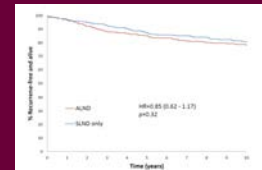
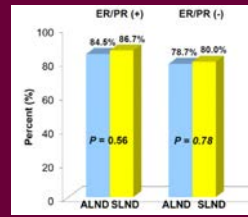
Gentilini OD, Bottzeli E, Sangalli C, et al. SOUND Trial Group. Sentinel lymph node biopsy vs no axillary surgery in patients with small breast cancer and negative results on ultrasonography of axillary lymph nodes: SOUND randomized clinical trial. JAMA Oncol. Published online September 21, 2023. doi:10.1001/jamaoncol.2023.3759

Gentilini et al. JAMA Oncol. 2023

86

ACOSOG Z0011

- RCT of SLN vs ALND for T1-2 cancers and 1 or 2 + SLN
- Lumpectomy and planned WBRT
- Planned adjuvant therapy
- At ALND, 27% had residual + nodes
- Radiation treatment
 - 89% whole breast
 - 15-19% regional nodal RT
 - 50% high tangents



With 10 year follow up, there is no role for ALND for patients with +SLN and otherwise meeting Z11 criteria (< 3 +nodes, XRT, adjuvant Rx)

87

Poll Everywhere

- You are seeing a 52 year old patient who initially presented with a 4 cm triple negative (ER-, PR-, HER2-) IDC with a positive lymph node. She has now completed neoadjuvant chemotherapy and had an excellent response. On imaging her breast cancer is no longer visible and the lymph node now has normal appearance. She is planning to undergo lumpectomy.

88



89

Node Positive Patients after NAC

- ACOSOG Z1071¹
- SENTINA²
- SN FNAC³

- Design: cT1-4 N1-2 underwent NAC followed by SLN and ALND.
- Compared SLN pathology to the remaining axillary nodes (FNR)

¹Boughey et al. JAMA 2013 Oct 9;310(14):1455-61.
²Kuehn et al. Lancet Oncol. 2013 Jun;14(7):609-18.
³Boileau et al. J Clin Oncol. 2015 Jan 20;33(3):258-64

90

Node Positive Patients after NAC

	ACOSOG Z1071 ¹	SENTINA ²	SN FNAC ³
SLN Identification Rate	92.7%	87.8%	87.6%
Overall FNR	12.6%	14.2%	13.4%
FNR			
Mapping Agents			
One Agent	20.3%	16%	16%
Dual Agent	10.8%	8.6%	5.2%
Number SLN			
1 SLN	31%	24.3%	18.2%
2 SLN	21.1%	18.5%	
≥ 3 SLN	9.1%	4.9%	4.9%
IHC	8.7%	NR	8.4%

¹Boughey et al. JAMA 2013 Oct 9;310(14):1455-61.
²Kuehn et al. Lancet Oncol. 2013 Jun;14(7):609-18.
³Boileau et al. J Clin Oncol. 2015 Jan 20;33(3):258-64

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ACOSOG 1071

- Subgroup with clipped positive node
- When clipped node was in SLN FNR dropped to 6.8%

Boughey et al. JAMA 2013 Oct 9;310(14):1455-61.

92

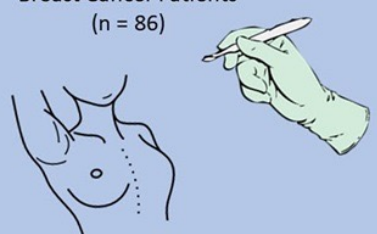

TAD: MD Anderson

- MD Anderson: TAD (targeted axillary dissection) trial
 - 191 patients
 - FNR for clipped node alone 4.2%
 - FNR for SLN alone 10.1%
 - FNR for SLN + clipped node 1.4%


Caudle et al. J Clin Oncol 2016

93

Prospective Evaluation of Radar Localized Reflector (RLR) Directed Targeted Axillary Dissection (TAD) in Node-Positive Breast Cancer Patients after Neoadjuvant Systemic Therapy (NST)

<p>STUDY POPULATION</p> <p>Biopsy-proven T1-2, N1-3 Breast Cancer Patients (n = 86)</p>  <p>All underwent radar localized reflector (RLR) TAD followed by axillary lymph node dissection</p>	<p>FEASIBILITY RATE</p> <p>RLR Placed Pre-NST 100%</p>  <p>RLR Placed Post-NST 90%</p>	<p>FALSE-NEGATIVE RATE</p> <p style="font-size: 2em; text-align: center;">5.1%</p> <p>RLR TAD has high accuracy, especially when RLR is placed Pre-NST</p>
--	--	--

Gallagher et al. J Am Coll Surg, April 2022



94

Poll Everywhere

- You are seeing a 52 year old patient who initially presented with a 4 cm triple negative (ER-, PR-, HER2-) IDC with a positive lymph node. She has now completed neoadjuvant chemotherapy and had an excellent response. On imaging her breast cancer is no longer visible and the lymph node now has normal appearance.
- She has now completed lumpectomy/TAD and final pathology shows she has 2/3 lymph nodes involved with carcinoma, the largest metastasis measuring 9 mm.

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What surgery should she have next?

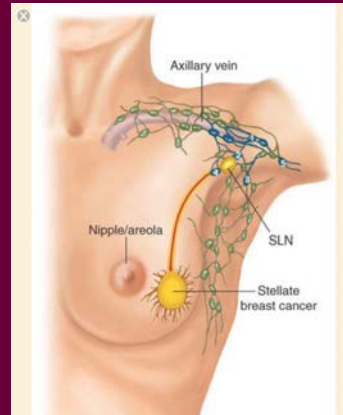
Option	Percentage
No additional surgery	0%
Completion axillary lymph node dissection	0%

Start the presentation to see live content. For screen share software, share the entire screen. Get help at polllev.com/app

96

What to do with N+ After NACT

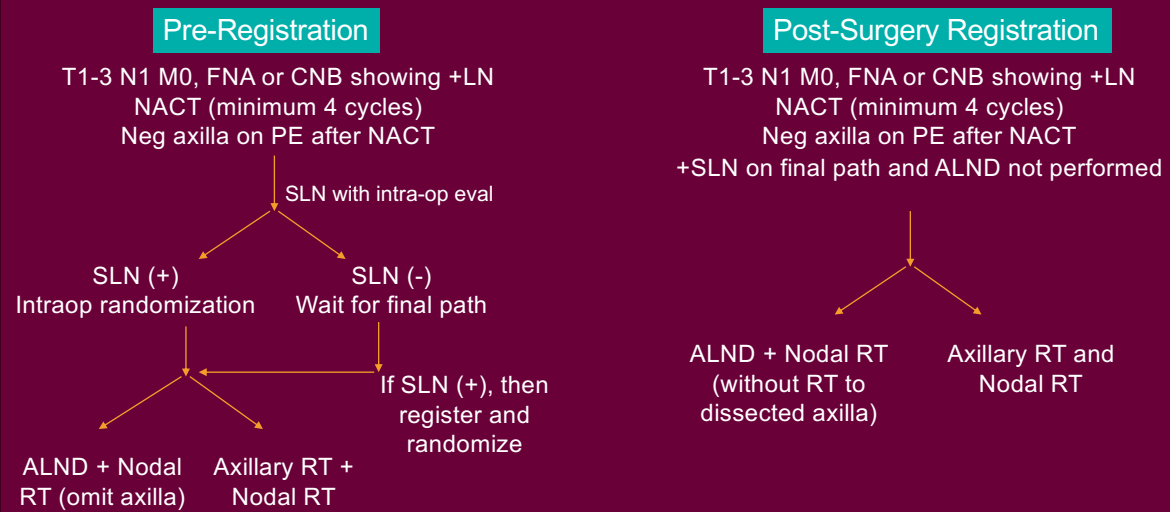
- Currently: Axillary lymph node dissection



97

Alliance A011202: A Randomized Phase III Trial Comparing Axillary Lymph Node Dissection to Axillary Radiation in Breast Cancer Patients (cT1-3 N1) Who Have Positive Sentinel Lymph Node Disease After Receiving Neoadjuvant Chemotherapy

Judy Boughey MD, Bruce Haffty MD, Thomas Buchholz MD, W. Fraser Symmans MD, Kelly Hunt MD, Jane Armer, PhD, RN, Vera Suman PhD



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The screenshot shows the top portion of a ScienceDirect article page. At the top left is the Elsevier logo, and in the center is the ScienceDirect logo. Below the ScienceDirect logo is the journal homepage URL: www.JournalofSurgicalResearch.com. To the right is a small thumbnail of the journal cover. Below the journal information is the Association for Academic Surgery logo. The main title of the article is "Omission of Axillary Dissection in Node Positive Breast Cancer After Neoadjuvant Systemic Therapy". To the right of the title is a "Check for updates" button. Below the title are the authors: Gray B. Peery, BS,^a Joyce Pak, MPH,^b Laura Burkbauer, MD,^a Chris B. Agala, PhD,^a Julia M. Selfridge, MD,^a Kristalyn K. Gallagher, DO,^a and Philip M. Spanheimer, MD^{a,*}. At the bottom right of the article preview, it says "Peery et al. J Sur Res 2023".

99

Novel Technique to Minimize Lymphedema

100

Lymphedema

- Can develop within days and up to 30 years
- 80% within 3 years of surgery; the remainder at a rate of 1% per year
- “Lymphedema is worse than mastectomy”
- “I fear lymphedema more than the cancer”
- “Lymphedema reminds me I have cancer every day”



--Disipio, Lancet Oncol 2013 Metaanalysis of 72 studies

101

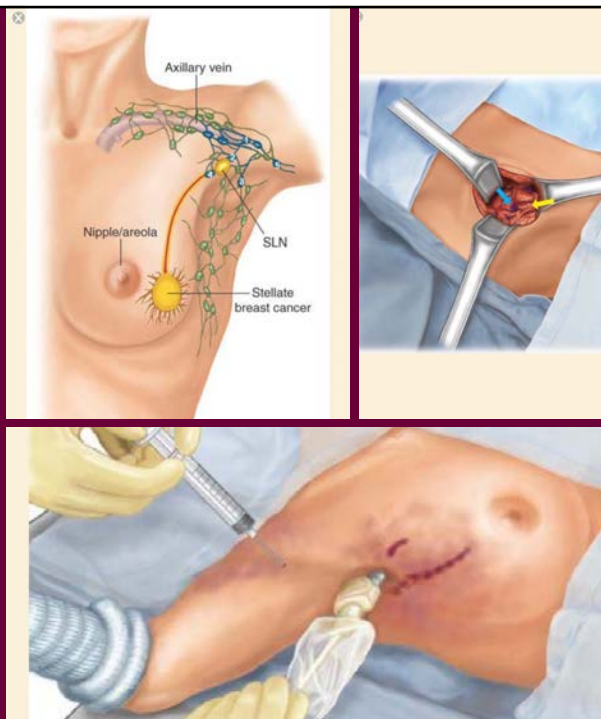
Etiologic Factors

Non-Controllable	Controllable
<ul style="list-style-type: none">• Obesity• Age >55• Hypertension• Infection• Increase tumor size• Nodal burden• Recurrence	<ul style="list-style-type: none">• <u>Damage</u>• Radiation• Surgery• Chemotherapy

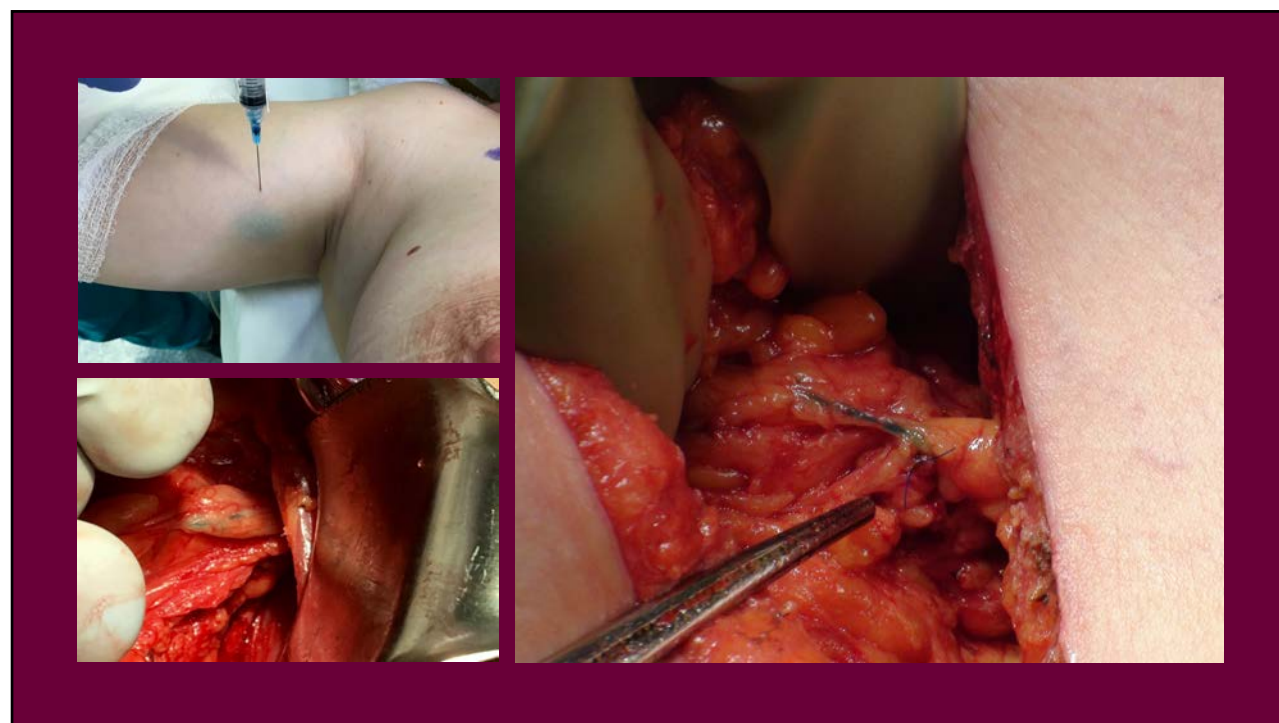
102

Axillary Reverse Mapping

- Hypothesis: Mapping the drainage of the arm with blue dye: **Axillary Reverse Mapping (ARM)** and sparing or reapproximating the lymphatics draining the upper extremity during SLNB or ALND would decrease the subsequent development of lymphedema as compared to SLNB or ALND without sparing the upper extremity lymphatics.



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EFFECTIVE Lymphedema

SLNB	0.8% (3/350)
ALND	6.5% (10/154)
TOTAL	2.5% (13/504)

Tummel et al. Ann Surg 2017

105

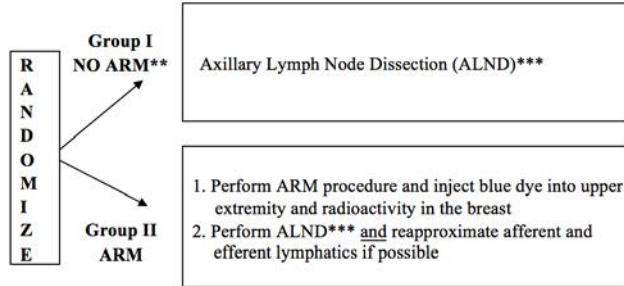
Anastomosis

	BLUE ARM Transections	Lymphedema
Not <u>Reanastomosed</u>	54.2% (39/72)	12.8% (5/39)
<u>Reanastomosed</u>	45.8% (33/72)	0% (0/33)

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**A221702:
Axillary
Reverse
Mapping**

Schema II for Patients with >2 Positive Nodes (Clinical or Occult*) Undergoing Breast Conserving Surgery

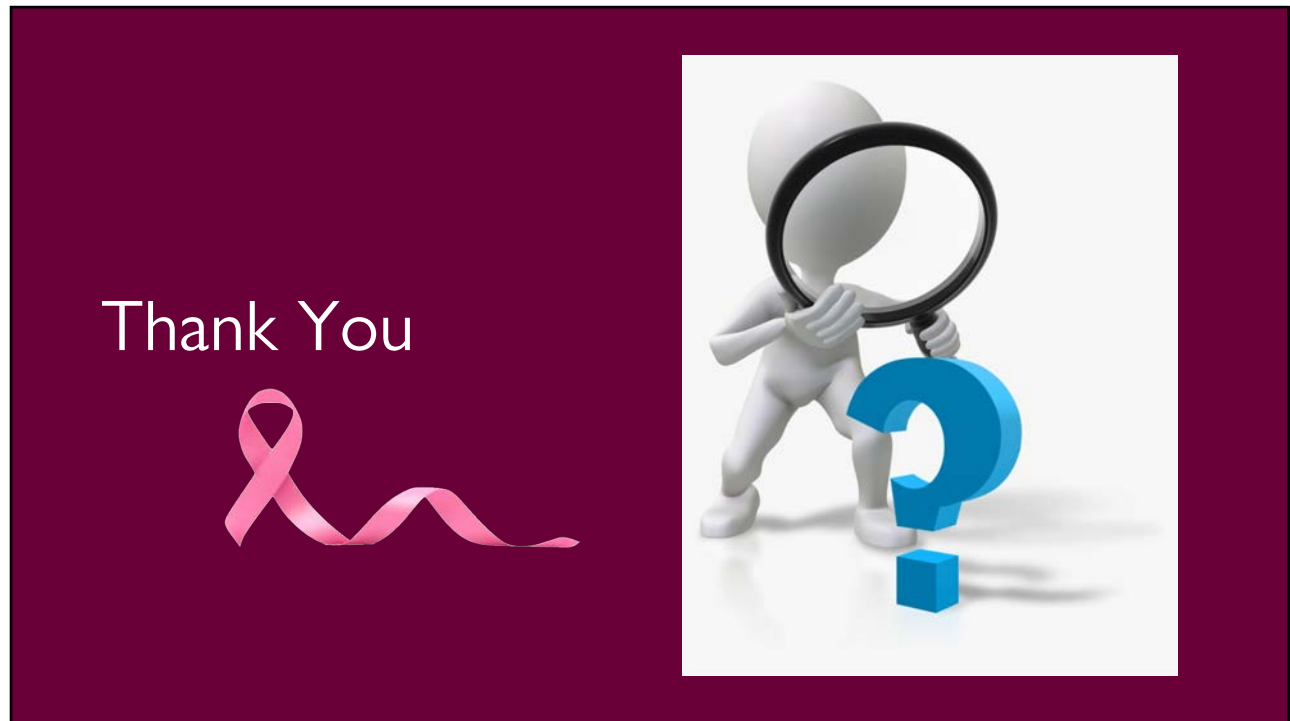


* Meaning positive by surgery but not known beforehand
** ARM: Axillary Reverse Mapping
*** May be performed with or without a sentinel lymph node biopsy (SLNB)

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108




109



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Thank You . . .

**University Cancer
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The Telehealth Team

Tim Poe – Director

Veneranda Obure – Technology Support Specialist	Andrew Dodgson , DPT – Continuing Education Specialist
Jon Powell , PhD – Continuing Education Specialist	Patrick Muscarella – Technology Support Technician
Oliver Marth – Technology Support Technician	Lindsey Reich , MA – Public Communication Specialist
Barbara Walsh , DNP, MPH, MSN, RN – Nurse Planner	

The song *Back Rhodes* written and performed by **Don Poe**

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Upcoming Live Webinars learn.unclcn.org

	<p>PATIENT-CENTERED CARE </p> <p>Colorectal Cancer: Epidemiology, Risk Factors, and Screening Strategies</p> <p>Lisa M. Gangarosa, MD</p>	<p>July 10 12:00 PM</p>
	<p>ADVANCED PRACTICE PROVIDER </p> <p>Strategies for Managing Toxicities of Oral Oncolytics</p> <p>Kevin Chen, PharmD, MS Bianka Patel, PharmD, CPP Aimee Faso, PharmD, BCOP, CPP</p>	<p>July 17 4:00 PM</p>
	<p>PATIENT-CENTERED CARE </p> <p>Community Engagement in Cancer Care</p> <p>Veronica Carlisle, MPH, CHES</p>	<p>August 14 12:00 PM</p>

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Self-Paced, Online Courses

learn.unclcn.org/spoc



PATIENT-CENTERED CARE Self-Paced, Online Course

Updates on Management of Early-Stage Breast Cancer

Yara Abdou, MD



ADVANCED PRACTICE PROVIDER Self-Paced, Online Course

Using Acceptance and Commitment Therapy (ACT) to Help Cancer Survivors Move Forward After Treatment

Melissa Holt, DNP, PMHNP-BC **Lisa Kanser, PsyD**



RESEARCH TO PRACTICE Self-Paced, Online Course

Current Concepts in Spinal Oncology

Michael Galgano, MD, FAANS

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