

The breast and axilla: How far we've come and where we're headed to next..

Julie Le, MD

Assistant Clinical Professor

Breast Surgical Oncology Division

UC San Diego Health

jul128@ucsd.edu



De-escalation of lymph node surgery for early stage cancers



Society of Surgical Oncology



Five Things Physicians and Patients Should Question

(2016) Don't **routinely** use sentinel node biopsy in clinically node negative women >70 years of age with hormone receptor positive, HER2-negative invasive breast cancer.

Sentinel Node vs Observation After Axillary Ultra-Sound (SOUND)

JAMA Oncology

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

POPULATION

1463 Women



Adult women with breast cancer smaller than 2 cm and negative preoperative axillary ultrasound
Median (IQR) age, 60 (52-68) y

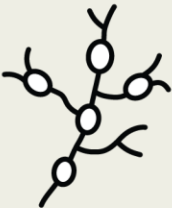
SETTINGS / LOCATIONS



**18 Hospitals
in 4 countries**

INTERVENTION

1463 Patients randomized and analyzed



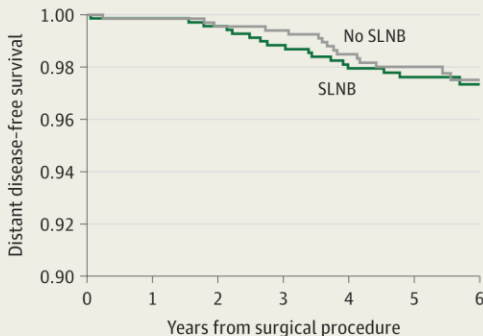
727 Sentinel node biopsy (SLNB)
SLNB was performed (control group)



736 No SLNB
SLNB was omitted (experimental group)

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



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 $P = .02$)

	SNLB	No SNLB
Axillary recurrence	0.4%	0.7%
LRR	1.7%	1.6%
Distant met	1.8%	2%
Deaths	3%	2.6%

Gentilini OD, Botteri 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

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INSEMA - taking SOUND one T stage further

- INSEMA trial aimed to investigate whether surgical axillary staging as part of breast-conserving therapy (BCT) for early BC can be avoided without compromising survival
- Prospective, randomized, noninferiority trial
- Enrolled patients ≥ 18 y.o. with “early” invasive breast cancer, defined as:
 - ***Tumor size ≤ 5 cm (clinical T1-T2)***
 - Node negative on clinical assessment (cN0) and imaging (iN0); if iN+, negative Bx or FNA required
- Underwent BCT (lumpectomy PLUS post-operative whole-breast radiotherapy)

Goal: show noninferiority of complete omission of axillary surgery to SLNB with respect to **iDFS**

INSEMA - taking SOUND one T stage further

	SOUND	INSEMA
Median age	60	62
Tumor size	Median - 1.1cm	90% T1: 1.1cm (Median T2: 2.5cm)
Tumor Grade	80% G1-G2	96% G1-G2
ER+HER2-patients	88%	95%

Noninferiority criteria met for iDFS

5 year iDFS:

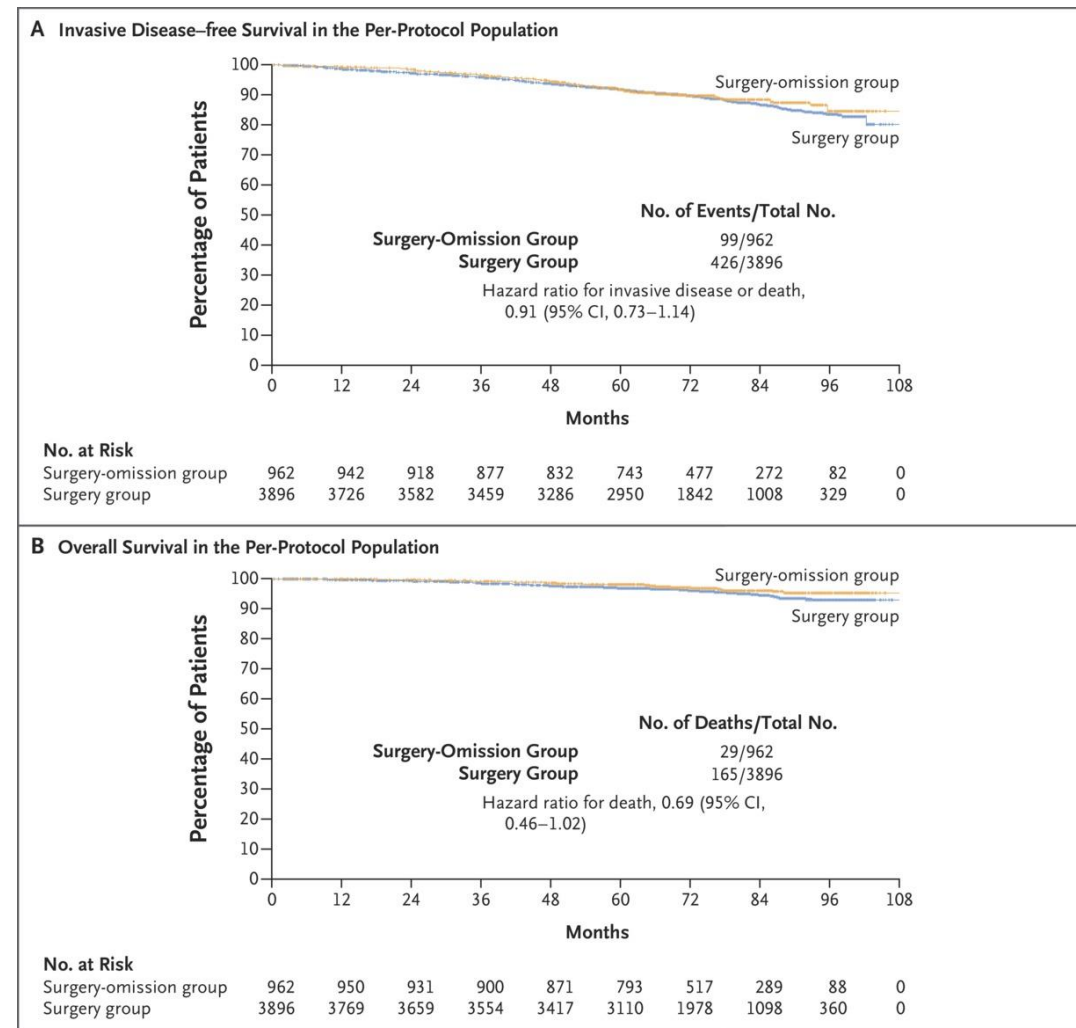
-**91.9%** (95% CI 89.9%-93.5%) for **no axillary surgery**

-**91.7%** (95% CI 90.8%-92.6%) for **SLN surgery**

5 year Overall Survival (OS):

-**98.2%** (95% CI 97.1%-98.9%) for **no axillary surgery**

-**96.9%** (95% CI 96.3%-97.5%) for **SLN surgery**



SNLB omission studies

	SOUND (2023)	INSEMA (2025)	BOOG 2013-08 (2025 – SABCS)	NAUTILUS
Study population	1463	4858	1574	1734
Median age	60	62	61	55 (40% premenop)
Tumor size	1.1cm	90% T1: 1.1cm (Median T2: 2.5cm)	83% T1	1.3cm 86% T1
Tumor Grade	80% G1-G2	96% G1-G2	83% G1-G2	TBD 2027
ER+HER2- patients	88%	95%	86%	TBD 2027
LRR	SNLB – 1.7% No SNLB – 1.6%	SNLB – 1.4% No SNLB – 1.8%	SNLB - 0.5% No SNLB - 1.2%	TBD 2027
5-yr DDFS	SNLB – 97.7% No SNLB – 98%	(iDFS) SNLB – 91.1% No SNLB – 91.4%	SNLB – 98.3% No SNLB – 96.1%	TBD 2027

R. J. Schipper, et al. Omission of sentinel lymph node biopsy in clinically T1-2 node-negative breast cancer patients treated with breast-conserving therapy: results of the Dutch BOOG 2013-08 randomized controlled trial after a median follow-up of 5 years [abstract]. In: Proceedings of the San Antonio Breast Cancer Symposium 2025; 2025 Dec 9-12; San Antonio, TX. Philadelphia (PA): AACR; Clin Cancer Res 2026;32(4 Suppl):Abstract nr GS2-11.

ASCO April 2025 Guideline on SNLB omission

Clinicians should **not** recommend routine SLNB in select patients who are **postmenopausal and ≥ 50 years of age** and with negative findings on preoperative axillary ultrasound for **grade 1-2, small (≤ 2 cm), hormone receptor–positive**, human epidermal growth factor receptor 2–negative breast cancer and who undergo breast-conserving therapy.

Alternatives to surgery – cryoablation and ablative therapy

Cryoablation

Mechanism of Action

Cellular destruction through freezing

 10 min.

Freeze
• Cell shrinkage and dehydration • ↑ extracellular osmolarity



Cell dehydration

 8 min.

Passive thaw
• ↓ extracellular osmolarity • Cell swells and bursts



Cell swelling and membrane disruption

 10 min.

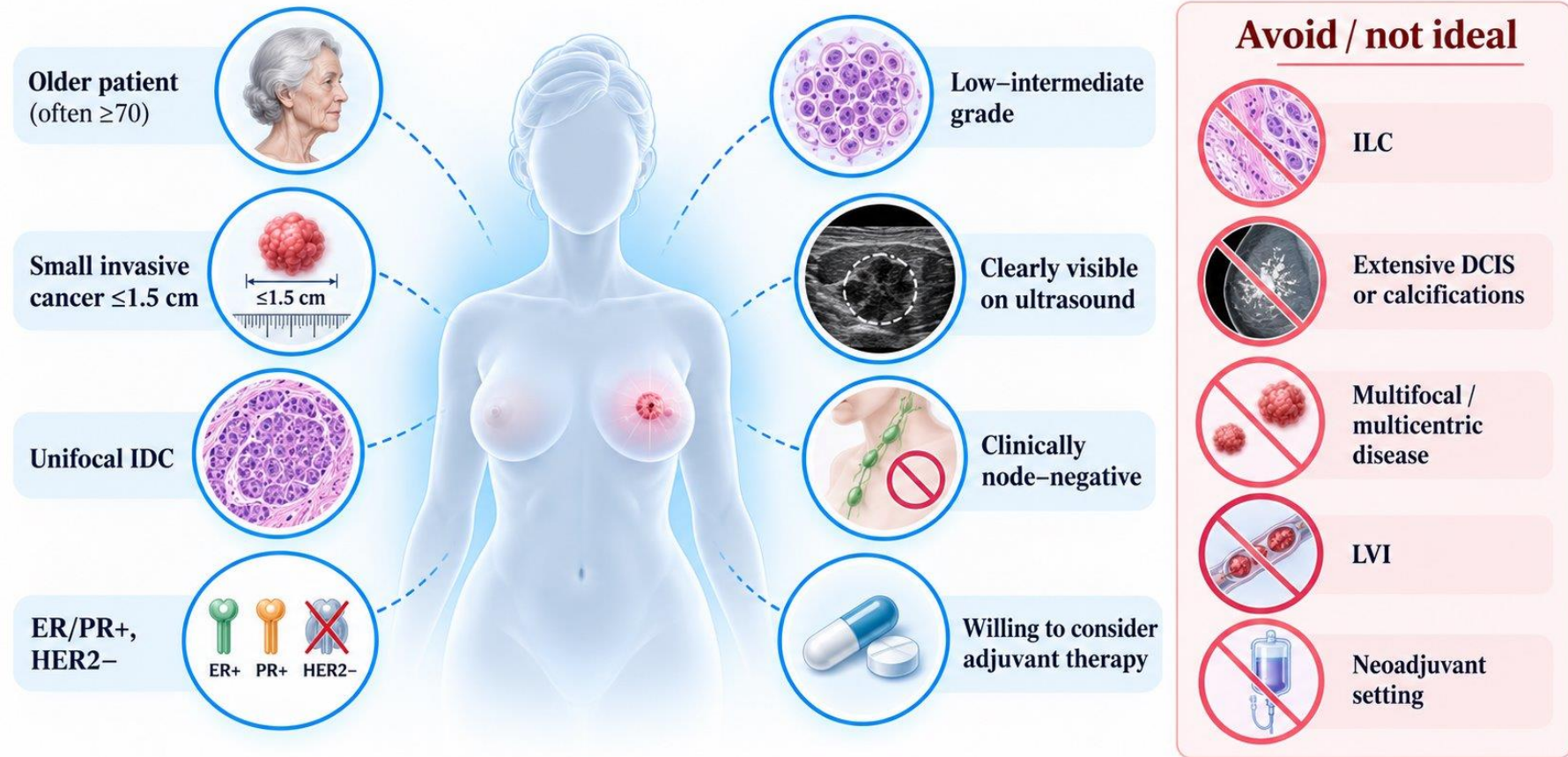
Second freeze
• Apoptosis • Necrosis • Immune activation



Ischemic necrosis and immune activation

Cryoablation

Ideal candidate for breast cryoablation



Cryoablation

Key Cryoablation Trials

ACOSOG Z1072 Published 2016	ICE3 Published 2024	FROST Published 2026
 Surgical excision with pathology	 No surgical excision	 Core biopsy (after ablation)
 Design Phase II; ablate then excise	 Design Prospective multicenter; no surgical excision	 Design Prospective
 Population Breast cancers ≤ 2 cm; $< 25\%$ intraductal component (limited DCIS)	 Population Age ≥ 60; IDC ≤ 1.5 cm; HR+/HER2-	 Population Age ≥ 50; stage I HR+/HER2-; US-visible IDC
 Verification / follow-up Pathology confirmation after excision	 Verification / follow-up Imaging follow-up	 Verification / follow-up 6-month core biopsy
 Key outcome Complete ablation 75.9% overall; 92% for targeted lesion	 Key outcome 194 patients; 5-year IBTR 4.3%	 Key outcome 0/82 residual cancer on biopsy; 5-year IBTR 3.64%

Laser (thermal) Ablation

BR-002 Trial

Ann Surg Oncol (2018) 25:2958–2964
<https://doi.org/10.1245/s10434-018-6623-2>

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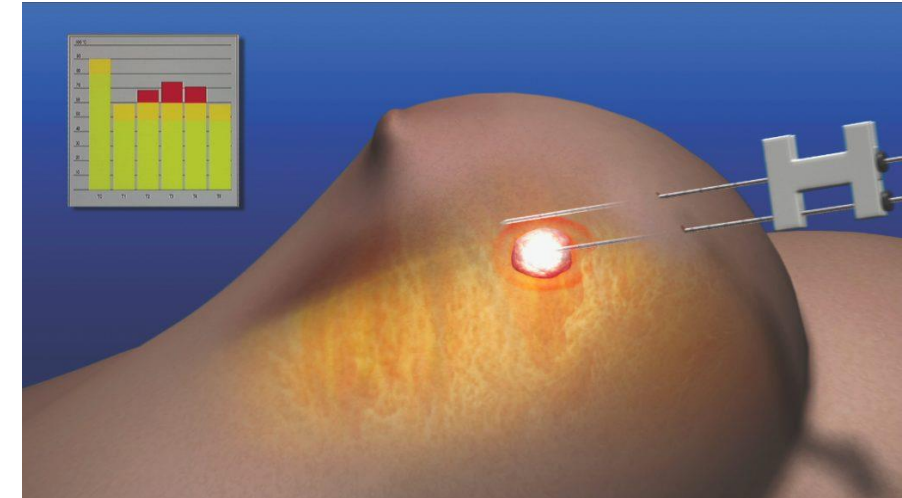


ORIGINAL ARTICLE – BREAST ONCOLOGY

Phase 2 Open-Label Trial Investigating Percutaneous Laser Ablation for Treatment of Early-Stage Breast Cancer: MRI, Pathology, and Outcome Correlations

Barbara Schwartzberg, MD¹, John Lewin, MD², Osama Abdelatif, MD³, Jacqueline Bernard, MD⁴, Hanadi Bu-Ali, MD⁵, Simon Cawthorn, Mr⁶, Margaret Chen-Seetoo, MD⁷, Sheldon Feldman, MD⁸, Sasirekha Govindarajulu, Miss⁶, Lyn Jones, MD⁶, Arne Juetten, MD⁹, Sanjay Kavia, MD¹⁰, Robert Maganini, MD¹¹, Simon Pain, Mr⁹, Mike Shere, MD⁶, Craig Shriver, MD⁴, Simon Smith, Mr¹⁰, Alexandra Valencia, MD⁶, Eric Whitacre, MD¹², and Roger Whitney, MD¹⁰

¹Sarah Cannon Research Institute at Rose Medical Center, Denver, CO; ²Women's Imaging Center, Denver, CO; ³Tucson Pathology Associates, Tucson, AZ; ⁴Walter Reed National Military Medical Center, Bethesda, MD; ⁵Virginia Piper Cancer Institute, St. Paul, MN; ⁶Southmead Hospital, Bristol, UK; ⁷Herbert Irving Pavilion, Columbia University, New York, NY; ⁸Montefiore Einstein Center for Cancer Care, Bronx, NY; ⁹Norfolk and Norwich University Hospital, Norwich, UK; ¹⁰Broomfield Hospital, Chelmsford, UK; ¹¹St. Alexius Breast Care Center, Bartlett, IL; ¹²Breast Center of Southern Arizona, Tucson, AZ



2 probes :

- 1 probe to deliver energy to destroy tumor
- 1 probe at edge of tumor to track temp

97% success rate of complete ablation
When tumors <15mm

Laser (thermal) Ablation

Follow-up BR-003 Trial

- Currently open at UCSD for patients with tumors <15mm that have to be >5mm from skin or chest wall
- Visible on US and MRI
- Surgical removal occurs shortly after ablation

Confirmatory Clinical Evaluation of Novilase® Laser Therapy for Focal Destruction of Malignant Breast Tumors

a study on [Malignant Neoplasm](#) and [Breast Cancer](#)



for females ages 18 years and up ([full criteria](#))



[at La Jolla, California and other locations](#)



study started August 2023

study ends around March 2027



by [Haydee Ojeda-Fournier, MD](#)

De-escalation of surgery after chemotherapy

Is SLNB enough for patients who were cN+ and then convert to ypN0? YES

JAMA Oncology | Brief Report

Nodal Recurrence in Patients With Node-Positive Breast Cancer Treated With Sentinel Node Biopsy Alone After Neoadjuvant Chemotherapy—A Rare Event

Andrea V. Barrio, MD; Giacomo Montagna, MD, MPH; Anita Mamtani, MD; Varadan Sevilimedu, MBBS, DrPH; Marcia Edelweiss, MD; Deborah Capko, MD; Hiram S. Cody III, MD; Mahmoud El-Tamer, MD; Mary L. Gemignani, MPH, MD; Alexandra Heerdt, MD; Laurie Kirstein, MD; Tracy-Ann Moo, MD; Melissa Pilewskie, MD; George Plitas, MD; Virgilio Sacchini, MD; Lisa Sclafani, MD; Audree Tadros, MD; Kimberly J. Van Zee, MS, MD; Monica Morrow, MD

Ann Surg Oncol (2021) 28:2621–2629
<https://doi.org/10.1245/s10434-020-09211-0>

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ORIGINAL ARTICLE – BREAST ONCOLOGY

Oncologic Safety of Sentinel Lymph Node Biopsy Alone After Neoadjuvant Chemotherapy for Breast Cancer

Stephanie M. Wong, MD, MPH^{1,2}, Mark Basik, MD^{1,2,3}, Livia Florianova, MD⁴, Richard Margolese, MD^{1,3}, Sinziana Dumitra, MD, MSc^{1,3}, Thierry Muanza, MD^{2,3,5}, Annie Carbonneau, MD⁵, Cristiano Ferrario, MD^{2,3}, and Jean Francois Boileau, MD, MSc¹

¹Department of Surgical Oncology, McGill University Medical School, Montreal, QC, Canada; ²Lady Davis Institute for Medical Research, Sir Mortimer B. Davis Jewish General Hospital, Montreal, Canada; ³Department of Oncology, McGill University Medical School, Montreal, QC, Canada; ⁴Department of Pathology, McGill University Medical School, Montreal, QC, Canada; ⁵Department of Radiation Oncology, McGill University Medical School, Montreal, QC, Canada

MSK Study: 234 patients converted to ypN0 after chemo and Treated with SLNB only.⁵

- 62% HER2+; 18% TNBC. Majority received postop RT (70%)
- 1 nodal recurrence (<0.5%) over F/U period 3.5 yrs

McGill Study: 58 pts cT1-2 → ypN0 and treated with SNLB/XRT

- 70% of these patients received RT
- No axillary recurrences at 5 yrs follow-up⁶

Is SLNB enough for patients who were cN+ and persist as ypN1? Alliance 011202 will answer this but in the meantime...

Observational Study > Ann Surg Oncol. 2025 May;32(5):3278-3291.
doi: 10.1245/s10434-025-16973-y. Epub 2025 Feb 13.

Oncologic Outcomes with De-Escalation of Axillary Surgery After Neoadjuvant Chemotherapy for Breast Cancer: Results from > 1500 Patients on the I-SPY2 Clinical Trial

Judy C Boughey¹, Hongmei Yu², Kayla Switalla³, Ladores Velle³, Alex Lopes³, Anne M Wallace⁴, Rachel B Lancaster⁵, Chantal R Reyna⁶, Todd M Tuttle⁷, Nora Jaskowiak⁸, Julia Tchou⁹, Roshni Rao¹⁰, Marie C Lee¹¹, Arpana M Naik¹², Mehra Golshan¹³, Cletus A Arciero¹⁴, Candice A M Sauder¹⁵, Cindy B Matsen¹⁶, Christina Yau³, Laura Esserman¹⁷, Rita A Mukhtar³; I-SPY2 Locoregional Working Group

Affiliations + expand
PMID: 39946078 PMCID: PMC12221658 DOI: 10.1245/s10434-025-16973-y

Retrospective review of prospective, multi-center RCT for high-risk breast cancers determined by genomic testing randomized to neoadjuvant novel agents/standard of care

N = 1515 with 501 ypN+ (127 SNLB only)

	SNLB only	ALND
Ax recurrence	5.2%	3.6%
LRR	7.7%	14%
DRFS	70%	66.7%
EFS	70.4%	63.2%

Conclusion: With short term follow-up, omission of ALND in selected patients in ypN0 and ypN+ was not associated with worsened axillary recurrence, LRR, DRFS and EFS.

De-escalation of breast surgery for exceptional responders

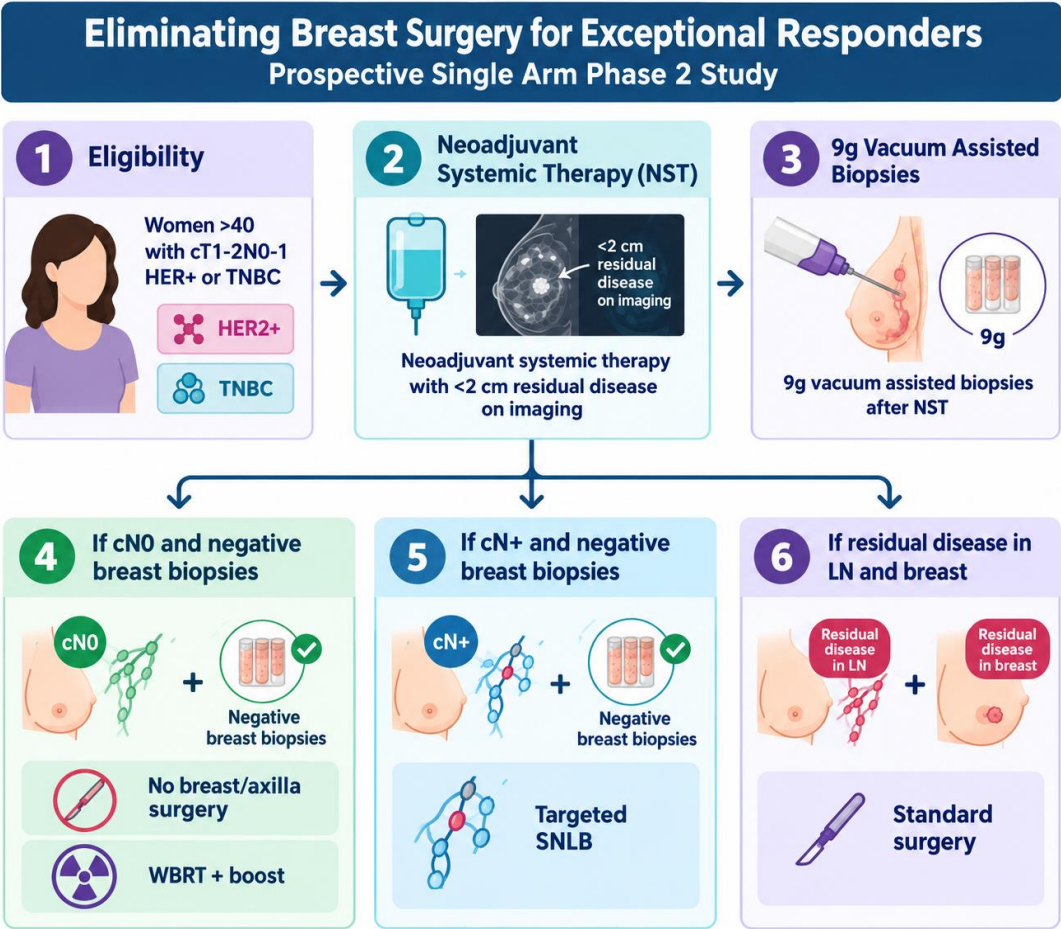
Path CR following neoadjuvant systemic therapy for HER2+ and TNBC can be as high as 60%.

JAMA Oncology | Original Investigation

Selective Elimination of Breast Surgery for Invasive Breast Cancer A Nonrandomized Clinical Trial

Henry M. Kuerer, MD, PhD; Vicente Valero, MD; Benjamin D. Smith, MD; Savitri Krishnamurthy, MD; Emilia J. Diego, MD; Helen M. Johnson, MD; Heather Lin, PhD; Yu Shen, PhD; Anthony Lucci, MD; Simona F. Shaitelman, MD, EdM; Melissa P. Mitchell, MD, PhD; Judy C. Boughey, MD; Richard L. White, MD; Kelly K. Hunt, MD; Wei T. Yang, MBBS, MHM; Gaiane M. Rauch, MD, PhD; for the Exceptional Responders Study Group

- 50 patients: 29 HER2+ and 21 TNBC
- 31 had breast pCR from biopsy therefore no breast surgery
 - Ipsilateral breast tumor recurrence rate 0% at 55 mts
 - 5 yr OS 100%



Take home messages

1. We can consider omitting SNLB in postmenopausal women >50 with ER+HER2- cN0 cancers if the lymph node sampling does not influence adjuvant therapy recommendations. Always best to discuss in a multidisciplinary fashion!
2. Ideal cryoablation candidates are patients >70 with unifocal tumors <1.5cm ER+HER2-, cN0 with ultrasound visible tumors and who are willing to consider adjuvant therapy
 - Thermal ablation may also become an option for similar candidates
3. Targeted sentinel lymph node sampling for cN+ converting to cN0 after chemotherapy is reasonable and has low axillary recurrences
4. Targeted sentinel lymph node sampling for ypN+ remains controversial but current data shows noninferior results for axillary recurrence, LRR, DRFS and EFS. We shall wait for Alliance 011202!
5. Keep eyes and ears perked for more studies regarding no breast surgery for exceptional responders following chemotherapy