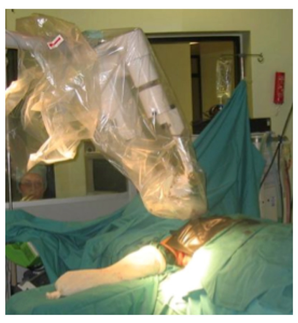
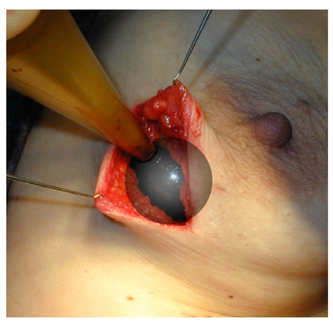
Substantially lower lung cancer incidence with TARGIT-IORT (targeted intraoperative radiotherapy) compared with whole breast radiotherapy in the TARGIT-A randomised trial for breast cancer: 25-year update

Jayant S Vaidya[1,2], Norman R. Williams[1], Max Bulsara[3], Michael Baum[1], Chris Brew-Graves[1], Ingrid Potyka[1], Nick Roberts[1], Julie Lindsay[4], Siobhan Laws[5], Sanjay Raj[5], Michael Douek[6], Mary Falzon[7], Gloria Petralia[8], Anu Malhotra[9], Sarah Needleman[10], Marcelle Bernstein[11], David Morgan[12], Jeffrey S. Tobias[7]

Background External beam whole breast radiotherapy (EBRT) given after breast conserving surgery inevitably leads to carcinogenic irradiation of nearby vital organs such as the lungs. **TARGIT-A randomised trial (recruited from 2000-2012) found that TARGIT-IORT during the initial lumpectomy is as effective as EBRT in controlling breast cancer.**





Over 50,000 breast cancer patients in 260 centres from 38 countries have been treated with TARGIT–IORT

targit.org.uk

BMJ 2020

BJC 2021

TARGIT-IORT reduced pain, improved cosmetic outcome, quality of life, and reduce travel and cost.

- **Significantly fewer deaths from non-breast-cancer causes with TARGIT-IORT vs. whole breast radiotherapy (EBRT).**
- **TARGIT-IORT conferred an overall survival benefit in patients with grade 1 or 2 cancers: 12-year mortality reduction from 15% to 10.5%**

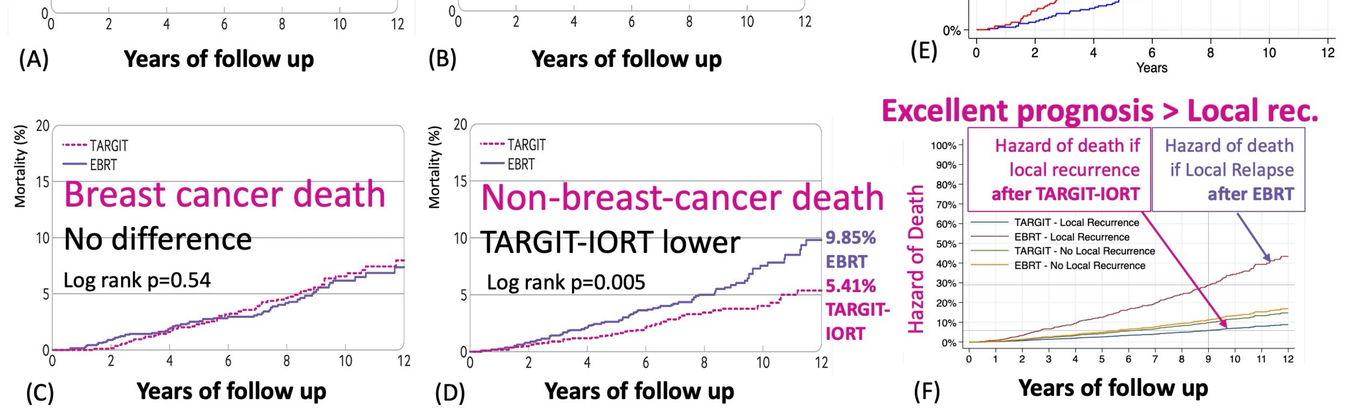
Previous results

TARGIT-A trial : TARGIT-IORT vs whole breast radiotherapy (EBRT): long-term results

Comparable long-term breast cancer outcomes

Significantly fewer non-breast cancer deaths: by 4.4% at 12 years

Improved overall survival if grade 1 or 2 (n=1797)



Material and methods

- We collected long term data about health status and new cancer diagnoses of UK patients from the TARGIT-A randomised trial, using direct patient contact, & NHS Digital data.
- We compared lung cancer incidence between patients randomised to TARGIT-IORT vs EBRT.

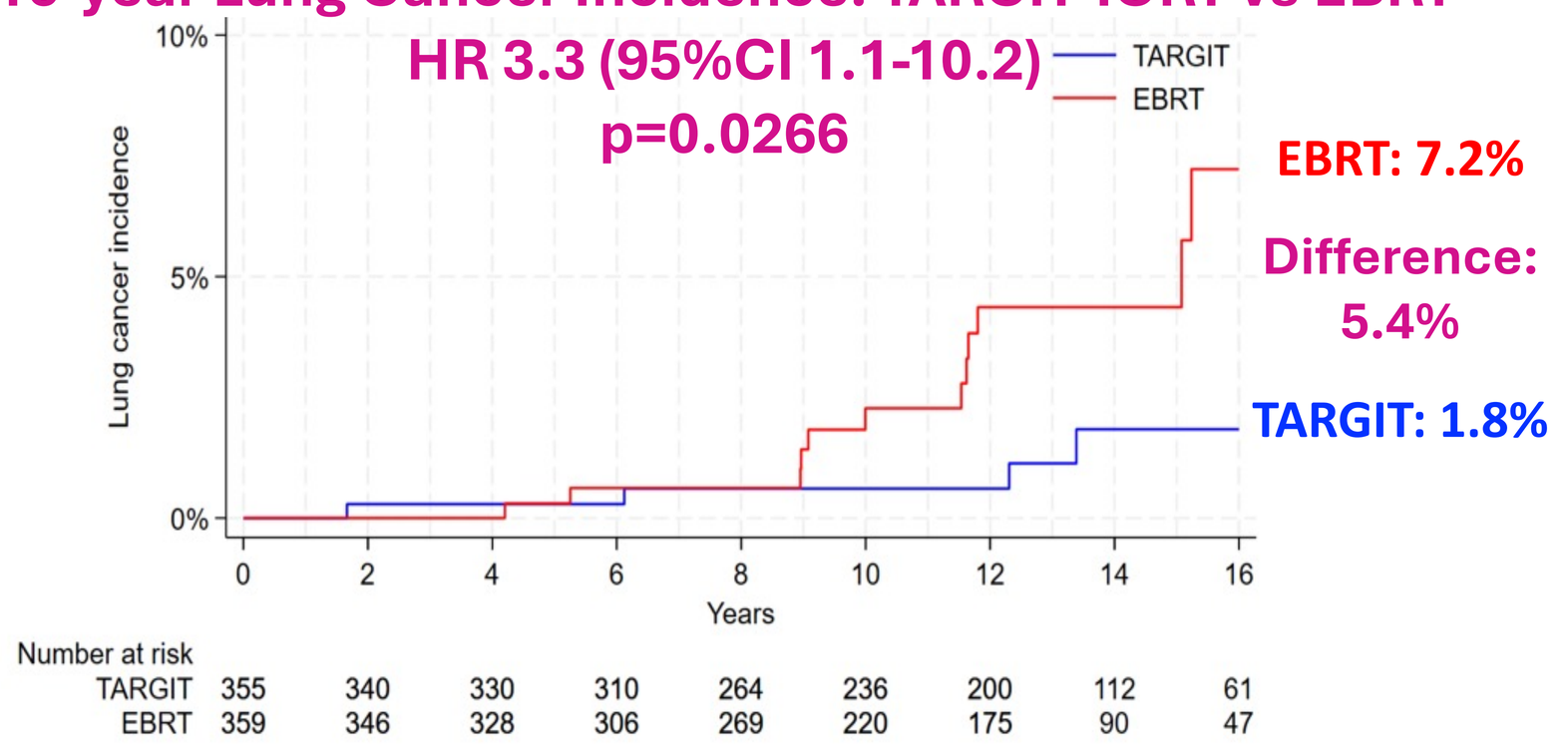
N.B. The duration of follow-up for patients receiving EBRT was slightly shorter vs TARGIT-IORT (p=0.0399). In other words, some cases of lung cancer in the EBRT group may have been missed, so the benefit of targeted intraoperative radiotherapy may have been underestimated.

New Results

16-year Lung Cancer Incidence: TARGIT-IORT vs EBRT

HR 3.3 (95%CI 1.1-10.2)

p=0.0266



Headline results

- Significantly more lung cancer with EBRT vs TARGIT-IORT HR 3.3 (95%CI 1.1-10.2)., p=0.0266
- 16-year incidence of lung cancer: EBRT: **7.2%** vs. TARGIT: **1.8%** Reduction with TARGIT-IORT = 5.4% (95%CI 0.3 -10.5)

50,000 breast cancer patients could avoid getting lung cancer by taking TARGIT-IORT

*An estimated 920,000 breast cancer patients worldwide are suitable for TARGIT-IORT during lumpectomy, annually.

Using the 5.38% reduction in lung cancer risk that we have observed, if TARGIT-IORT were to be made accessible to these patients, then 49,496 (95%CI 5500-134320) of these patients would be spared the diagnosis of a lung cancer during their follow up.

Conclusions

- With very long-term follow data from of a large TARGIT-A randomised trial, we found a substantial increase in lung cancer incidence with EBRT vs TARGIT-IORT.
- It is a tragedy when women who outlive breast cancer then succumb to this frequently lethal radiation-induced lung cancer, which is avoidable by using TARGIT-IORT during lumpectomy instead of post-operative EBRT.
- These new data further mandate* full discussion about benefits of TARGIT-IORT vs. EBRT with patients, including reduction in lung cancer incidence, *before their surgery*, so they have a choice to take it during their initial surgical excision.

*Discussion about TARGIT-IORT as an option to EBRT is mandatory as per GMC guidance and the UK law (UK Supreme Court. Montgomery v Lanarkshire Health Board. 11 Mar 2015.

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British Association of Surgical Oncology ~ Association for Cancer Surgery BASO~ACS `Conference, November 2025

UCL

Menopausal hormone therapy (HRT) for breast cancer patients: what is the current evidence?

MENO-ABC trial

Full paper published on 30 Sep 2025 in Menopause

Sarah J. Glynne[1], James A. Simon[2], Anthony Branson[3], Stephen Payne[4], Louise Newson[5], Isaac Manyonda[6], Susan Cleator[7], Michael Douek[8], Sasha Usiskin[9], Jeffrey S Tobias[10], Jayant S Vaidya[11].

 # 108

Introduction: Many breast cancer survivors struggle with menopausal symptoms during or after completing treatment. Hormone replacement therapy (HRT) is the gold-standard treatment but contraindicated after breast cancer as it may increase the risk of relapse. Our objectives were to review the evidence and develop a consensus statement to define the role of HRT after breast cancer.

Methods: A 25-member panel including 18 voting members (10 menopause specialists, 4 medical oncologists, 3 breast surgical oncologists, and 1 breast radiologist) developed the consensus statements using a modified Delphi methodology. Consensus was defined as ≥ 70% agreement with low-to-moderate variation in extent of agreement: Mean Absolute Deviation from Median of ≤ 0.75. We reviewed current evidence and developed a narrative synthesis. Finally, four additional breast cancer specialists peer-reviewed the manuscript.

Results: We found mainly moderate quality evidence concerning use of vaginal and systemic estrogen after breast cancer, and high-quality evidence concerning the benefits of anti-estrogen therapy for estrogen receptor positive breast cancer. The panel agreed that some women may choose to accept an increase in risk and take HRT to improve quality of life. Shared decision making is key.

Discussions and conclusions: We recommend that shared decisions are based on (1) an individual's menopausal symptoms and impact on quality of life, (2) the potential increase in an individual's risk of relapse by use of HRT, and (3) patient preferences, views and treatment goals. We strongly recommend registering all patients considering MHT after breast cancer in a clinical study (e.g., MENO-ABC).

Affiliations

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10,11. University College London, London, UK

Menopausal Hormone Therapy (MHT or HRT) After Breast Cancer: What is the Evidence?

Risk of Breast Cancer from Menopausal Hormone Therapy (MHT)

In women aged 50-59 in the general population:

23 out of 1000 women who never take MHT develop breast cancer over 5 years, 977 do not.

27 out of 1000 women who take combined MHT (estrogen plus a synthetic progestin) for 5 years from the age of 50 develop breast cancer, 973 do not.

19 out of 1000 women who take estrogen only MHT for 5 years from the age of 50 develop breast cancer, 981 do not.

*The risk of breast cancer relapse at median follow-up of 7 years is based on the sum of raw numbers from the HABITS and the Stockholm trials (median follow-up of 4 and 10.8 years respectively). Despite inherent limitations, these represent the best available randomised evidence. Risks after low-risk breast cancer are estimated assuming a proportional reduction in risk. The risk for an individual will depend on patient and tumour characteristics, the treatment received, the time since diagnosis, and possibly the type of MHT.

Authors: Dr Sarah Glynne, Prof James Simon, Dr Anthony Branson, Mr Stephen Payne, Dr Louise Newson, Prof Isaac Manyonda, Dr Susan Cleator, Prof Michael Douek, Dr Sasha Usiskin, Prof Jeffrey S Tobias, Prof Jayant S Vaidya.

References:

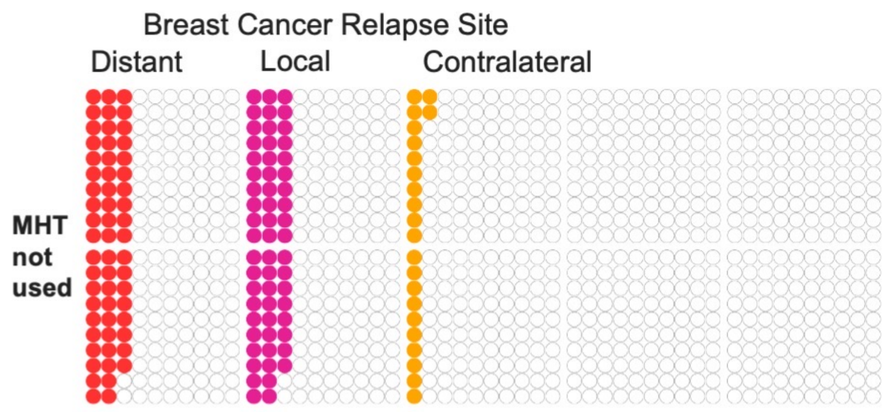
Women's Health Concern. Understanding the risks of breast cancer. A comparison of lifestyle risk factors versus Hormone Replacement Therapy (HRT) treatment. 2015. Available at: https://www.womens-health-concern.org/wp- content/uploads/2019/10/WHC-UnderstandingRisksofBreastCancer-MARCH2017.pdf. Accessed 30th June 2025.

Holmberg L, Iversen OE, Rudenstam CM, Hammar M, Kumpulainen E, Jaskiewicz J, et al. Increased risk of recurrence after hormone replacement therapy in breast cancer survivors. J Natl Cancer Inst. 2008;100(7):475-82

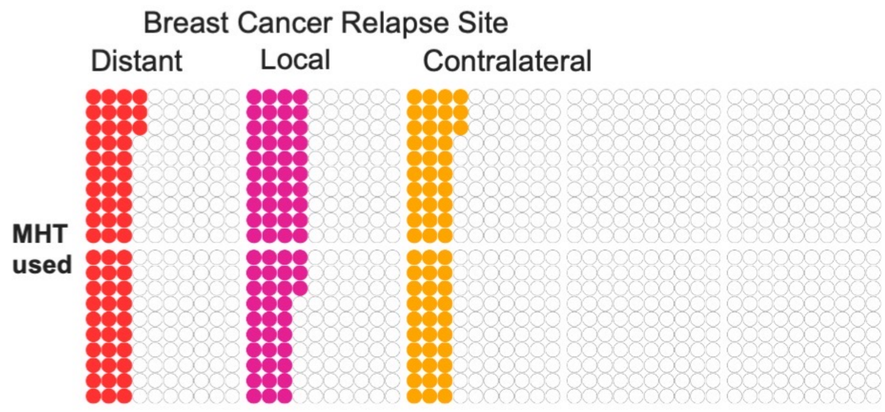
Fahlen M, Fornander T, Johansson H, Johansson U, Rutqvist LE, Wilking N, et al. Hormone replacement therapy after breast cancer: 10 year follow up of the Stockholm randomised trial. Eur J Cancer. 2013;49(1):52-9.

Risk of Breast Cancer Relapse from Menopausal Hormone Therapy (MHT)*

In women with moderate-risk breast cancer (14% risk of relapse):

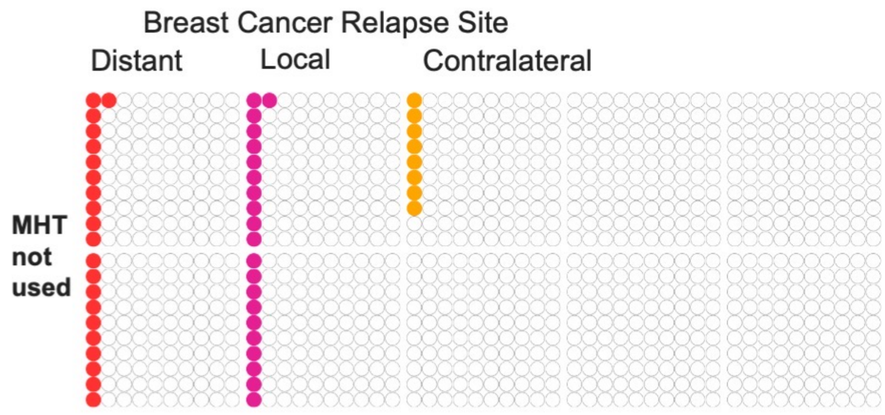


138 out of 1000 women with moderate-risk breast cancer, who do not use MHT, relapse after 7 years median follow-up: 58 distance relapse, 58 local recurrence, 22 contralateral breast cancer.

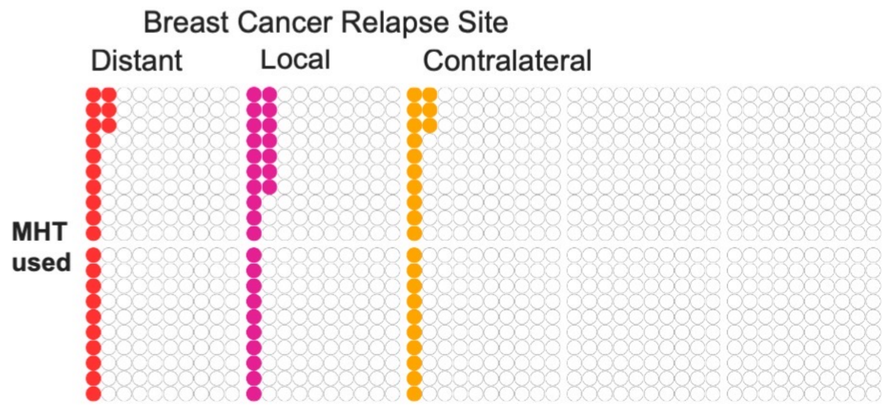


200 out of 1000 women with moderate-risk breast cancer, who take MHT, relapse at 7 years median follow-up: 63 distance relapse, 73 local recurrence, 63 contralateral breast cancer.

In women with low-risk breast cancer (5% risk of relapse)



50 out of 1000 women with low-risk breast cancer, who do not use MHT, relapse at 7 years median follow-up: 21 distance relapse, 21 local recurrence, 8 contralateral breast cancer.



72 out of 1000 women with low-risk breast cancer, who take MHT, relapse at 7 years median follow-up: 23 distance relapse, 27 local recurrence, 23 contralateral breast cancer.

Presented at the
British Association of Surgical Oncology
~ Association for Cancer Surgery
BASO~ACS ` Conference, November 2025

A novel methodology using direct patient contact and UK national registries to collect long-term data from randomised trials: Extended follow up of the TARGIT-A trial of intraoperative radiotherapy for breast cancer (TARGIT-X)

Full paper in press at NIHR Journals Library

Professor Jayant S Vaidya[1]*, Professor Norman R Williams[1], Professor Max Bulsara[1,2], Ms Chris-Brew Graves[1], Dr Ingrid Potyka[1], Mr Nicholas J Roberts[1], Ms Julie Lindsay[3], Dr Siobhan Laws[4], Dr Sanjay Raj[4], Professor Michael Douek[5,7,8], Dr Mary Falzon[6], Dr Gloria Petralia[6,8], Dr Sarah Needleman[9], Dr Anu Malhotra[7], Ms Marcelle Bernstein[10], Professor Jeffrey S Tobias[6].

 # 111

Introduction: Many diseases including breast cancer have a long natural history. Therefore, longer-term effects of treatments are important for patients and for their full evaluation. However, trial follow up data are collected by specific staff and funded for a relatively short duration. We evaluated whether we could collect follow up information for patients in a breast cancer randomised clinical trial by direct patient contact and data from national registries.

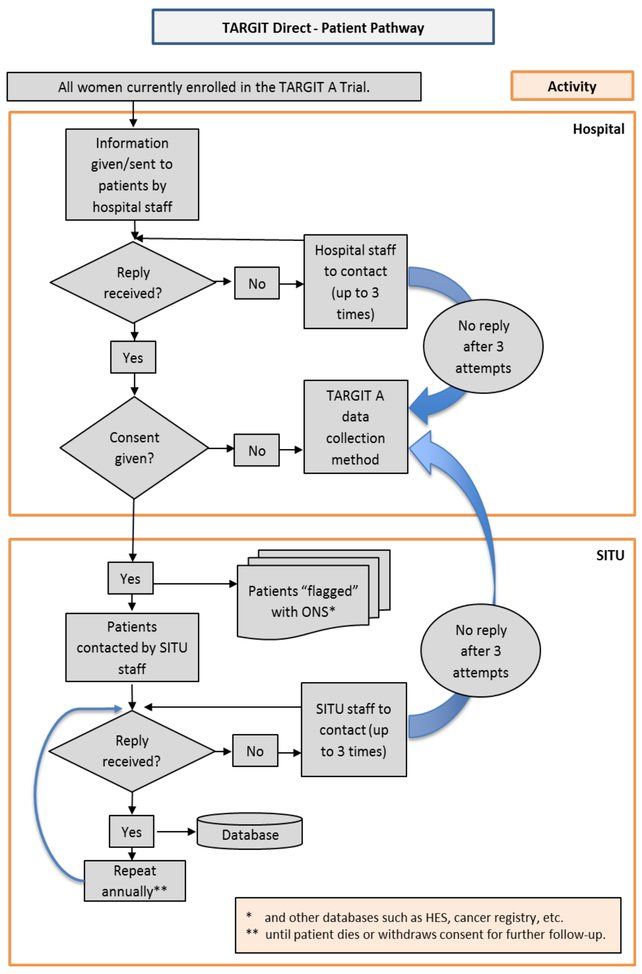
Setting: The TARGIT-A randomised clinical trials of targeted intraoperative radiotherapy during lumpectomy (TARGIT-IORT) vs whole breast radiotherapy (EBRT_ and delayed TARGIT-IORT vs EBRT (n=1153), recruited women with early breast cancer diagnosed in 33 centres in 12 countries, between March 2000 to June 2012.
We planned to recruit all UK patients from the TARGIT-A trials for extended follow-up. This was the first randomised trial of intraoperative radiotherapy for breast cancer.

TARGIT-IORT website

TARGIT-IORT literature

TARGIT-IORT BMJ paper

TARGIT-IORT BJC paper

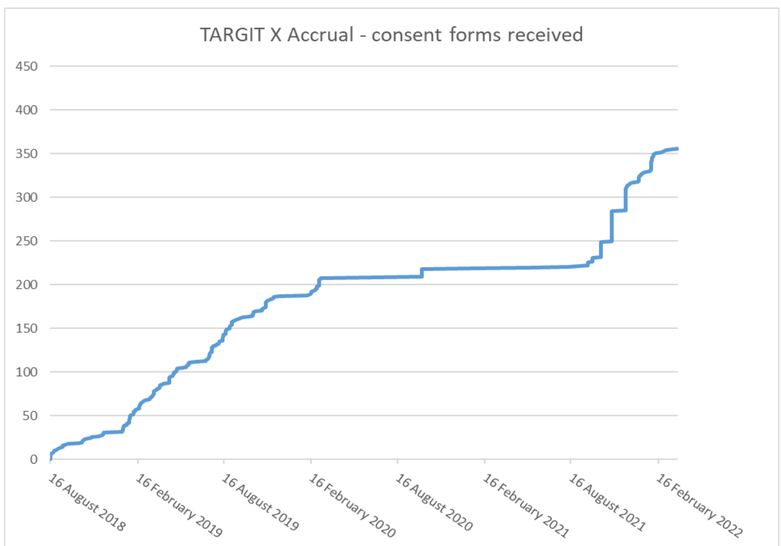


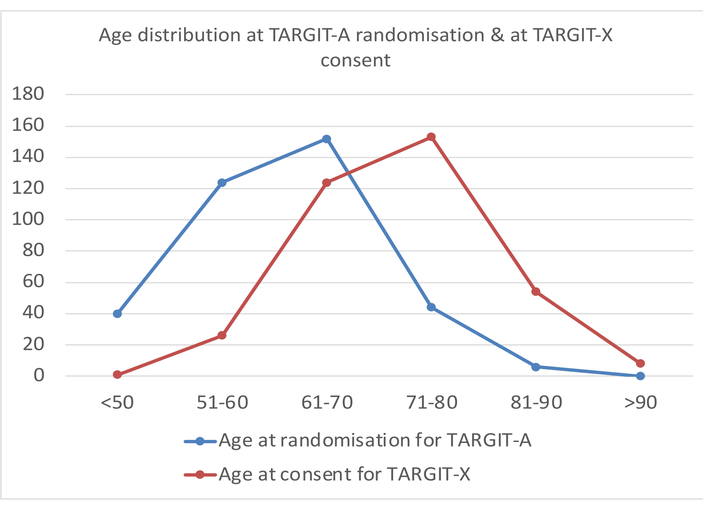
Methods:

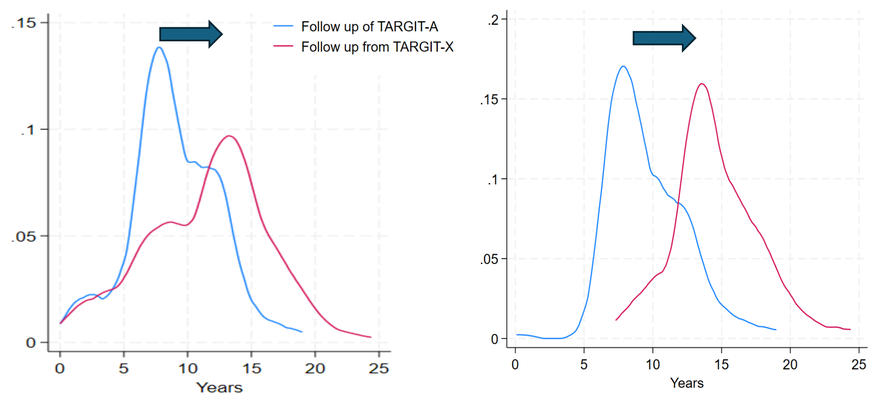
- We assessed the feasibility of recording whether patients are alive and their current health status including events related to breast cancer, and effects of radiotherapy such as lung cancer diagnoses, by direct patient contact and data from NHS Digital (health episodes, diagnoses and death).
- Patients were consented in collaboration with the recruiting site and then contacted annually, if appropriate, directly by the trial centre.
- We calculated the proportion of eligible patients whose status could be ascertained, contacted, consented and provided follow up information via direct patient contact and/or NHS Digital data. We estimated the additional years of follow up and its cost.

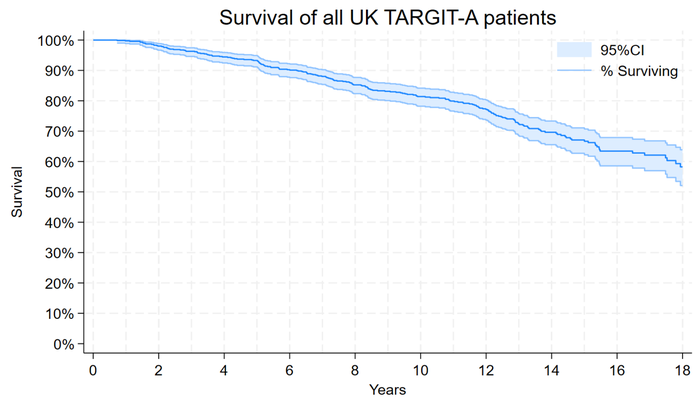
Results:

- 607 of 714 UK patients originally recruited in the TARGIT-A trials were initially eligible (dead/withdrawn not eligible).
- Of these, 94.5% (574/607) status / reason for non-participation was ascertained.
- Of these, 87% (502/574) patients' health status could be determined.
- Of these, 73% (366/502) or 60.3% of the total (366/607) were found to be in good health, provided valid consent for TARGIT-X and their health status.
- **Less than 5%(25/502) patients were unwilling to participate: 23 declined and 2 withdrew.**
- An additional 103 deaths recorded: doubling the initial number to 203.
- **A 65% overall survival at 15 years shows that unlike other PBI trials, TARGIT-A was NOT a low-risk cohort**
- The quality of data returned by patients was very good (e.g., mismatch rate for recording date <0.1%(1/1470 forms).
- **Patients who participated increased their follow up by a median 6 years (to 14 years (IQR 13 to 16)).**
- **The cost, including research funds, was < £60/patient/year of follow up.**
- Limitations included difficulties in receiving data from NHS Digital due to their due to repeated organisational changes, plus unexpected price rises in the costing of data download**.**









Recommendations for future research:

To investigate why treatments proven in large international randomised trials showing patient benefit and are cost-effective, are not widely adopted in the UK whilst they are included in almost every other country's clinical practice guideline and widely adopted worldwide, to assess the influence of preconceived notions, conflicts of interest, and improve NICE processes.

Conclusion:

- In the UK, 95% patients are willing to be followed up long-term.
- It is feasible to collect follow up data for long-term health conditions accurately from patients with direct patient contact together with NHS Digital.
- It leads to a substantial increase in the length of follow up and number of relevant events, at a low cost.
- Our new approach could be adopted as an efficient method of obtaining long-term follow up data from patients in randomised clinical trials.

FUNDED BY NIHR National Institute for Health Research

British Association of Surgical Oncology ~ Association for Cancer Surgery BASO~ACS ` Conference, November 2025

Affiliations: 1. University College London, 2. Institute for Health Research, University of Notre Dame, Fremantle, Australia, and UCL 3. Ninewells Hospital, Dundee, 4. Royal Hampshire Hospital, Winchester, 5. University of Oxford, Oxford, 6. University College London Hospital, 7. Guy's Hospital, London, 8. Oxford University Hospital, Oxford, 9. Royal Free Hospital, London, 10. Patient advocate, London, UK

Cumulative local recurrence rate is a misleading and non-representative outcome measure for early breast cancer trials

Prof Jayant S Vaidya, Prof Max Bulsara, Dr Uma J Vaidya, Dr David Morgan, Prof Michael Douek, Ms Marcelle Bernstein, Ms Chris Brew-Graves, Prof Norman R Williams, and Prof Jeffrey S Tobias

Preprint on medRχiv

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Introduction: We propose that the standard method of representing results of breast cancer radiotherapy clinical trials did not accurately represents what actually happens to patients: crucial for making treatment decisions.

Methods: While trying to present cumulative incidence rates of local recurrence (Kaplan-Meier plots) censoring- using patients' length of follow up until they had last been seen alive– is included in the statistical model. Censoring should be non-informative, balanced, and censored patients must continue to have a risk of a local recurrence. We submit that if deaths are censored, the same statistical value is given to those-who-have-died and those-who-are-alive-with-shorter-follow-up-than-others, and it leads to misleading estimates and graphs.

Results: We illustrate this point with six examples of reputed trials with erroneous graphs: e.g. 60% of patients were alive at 10 years, so those alive without a local recurrence should inevitably be lower than 60%, yet their graph shows that 90% are alive without local recurrence.
In contrast, local-recurrence-free survival (i.e. both death and local recurrence are events) truly represents what really happens to patients in terms of local control and effectiveness of treatment comprehensively, particularly when the treatments affect local disease and survival. It also follows the recommendations of ICH-GCP, European (DATECAN) and American (STEEP) guidelines.

Conclusion: The outcome of trials assessing local treatments such as radiotherapy for breast cancer, should be local recurrence-free survival, in which both local recurrence and deaths are events: it accurately reflects the expected outcomes, and should be used for shared decision-making with patients.

Cumulative local recurrence rate is a misleading and non-representative outcome — Example 1

The left-hand graph shows that only 60% are alive at 10 years. This being the case, how can 90% be alive without local failure as per the right-hand graph?

Self-contradictory

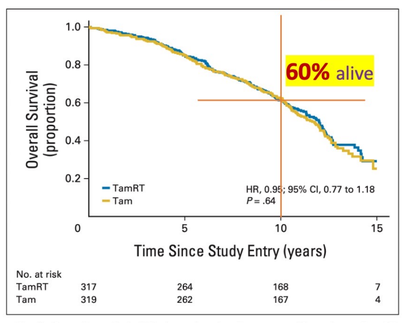


Fig 5. Overall survival. HR, hazard ratio; Tam, tamoxifen alone; TamRT, tamoxifen plus radiation therapy.

VOLUME 31 · NUMBER 19 · JULY 1 2013
JOURNAL OF CLINICAL ONCOLOGY ORIGINAL REPORT

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

Kevin S. Hughes, Lauren A. Schnaper, Jennifer R. Bellon, Constance T. Cirrincione, Donald A. Berry, Beryl McCormick, Hyman B. Muss, Barbara L. Smith, Clifford A. Hudis, Eric P. Winer, and William C. Wood

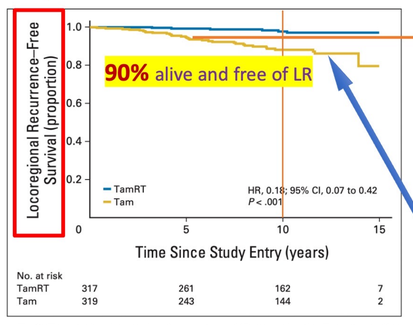


Fig 2. Time to local or regional recurrence. HR, hazard ratio; Tam, tamoxifen alone; TamRT, tamoxifen plus radiation therapy.

If only 60% are alive, how can >90% be alive without local recurrence (90% local recurrence free survival)?

So this right-hand graph labelled 'local recurrence free survival' is inaccurate and misleading for both patients and physicians. When the chance of being alive is only 60%, it is simply wrong to say that "You have a 90% chance of surviving without local recurrence"

Cumulative local recurrence rate is a misleading and non-representative outcome — Example 2

The left hand graph shows that only 80% are alive at 10 years. This being the case, how can 90% be alive without local failure as per the right-hand graph?

Self-contradictory

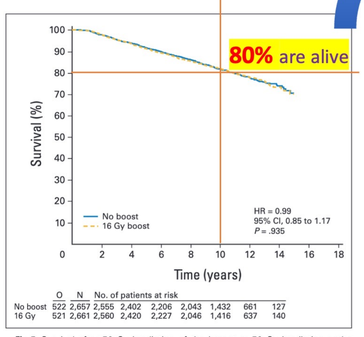


Fig 5. Survival after 50 Gy irradiation of the breast or 50 Gy irradiation and a boost. HR, hazard ratio; O, occurrences; N, number of patients at risk.

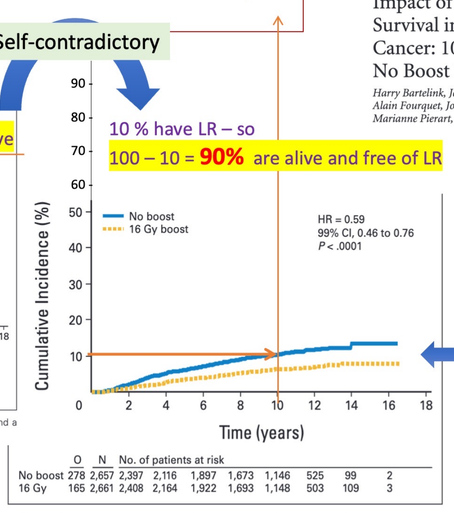


Fig 2. Cumulative incidence of recurrence of tumor as first event in the ipsilateral breast after 50 Gy whole-breast irradiation or 50 Gy whole-breast irradiation and a boost of 16 Gy. HR, hazard ratio; O, occurrences; N, number of patients at risk.

VOLUME 25 · NUMBER 22 · AUGUST 1 2007
JOURNAL OF CLINICAL ONCOLOGY ORIGINAL REPORT

Impact of a Higher Radiation Dose on Local Control and Survival in Breast-Conserving Therapy of Early Breast Cancer: 10-Year Results of the Randomized Boost Versus No Boost EORTC 22881-10882 Trial

Harry Bartelink, Jean-Claude Horiot, Philip M. Poortmans, Henk Struikmans, Walter Van den Bogaert, Alain Fourquet, Jos J. Jager, Willem J. Hoogenraad, S. Bing Oei, Carla C. Wárlám-Rodenhuis, Marianne Pierart, and Laurence Collette

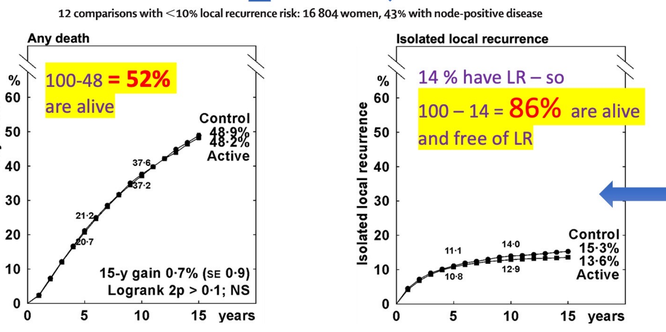
If only 80% are alive, how can >90% be alive without local recurrence?

So this right-hand graph is misleading for both patients and physicians.

Cumulative local recurrence rate is a misleading and non-representative outcome — Example 3

The left-hand graph shows that only 52% are alive at 10 years. This being the case, how can 86% be alive without local failure as per the right-hand graph?

Self-contradictory



Effects of radiotherapy and of differences in the extent of surgery for early breast cancer on local recurrence and 15-year survival: an overview of the randomised trials

*Early Breast Cancer Trialists' Collaborative Group (EBCTCG)**

Lancet 2005; 366: 2087–2106

Summary

Background In early breast cancer, variations in local treatment that substantially affect the risk of locoregional recurrence could also affect long-term breast cancer mortality. To examine this relationship, collaborative meta-analyses were undertaken, based on individual patient data, of the relevant randomised trials that began by 1995.

*Collaborators listed at end of report

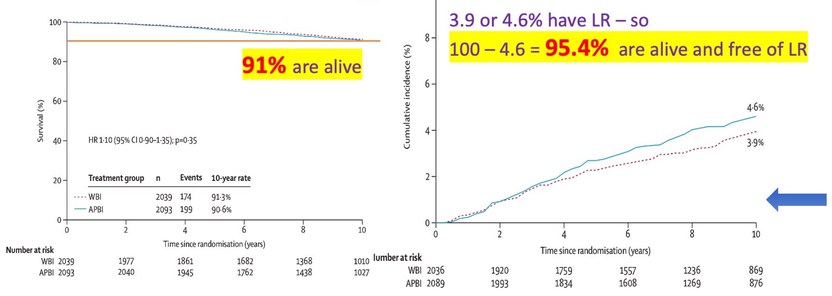
If only 52% are alive, how can >86% be alive without local recurrence?

So this right-hand graph is misleading for both patients and physicians.

Cumulative local recurrence rate is a misleading and non-representative outcome — Example 4

The left hand graph shows that only 91% are alive at 10 years. This being the case, how can 95% to 96% be alive without local failure as per the right hand graph?

Self-contradictory



Long-term primary results of accelerated partial breast irradiation after breast-conserving surgery for early-stage breast cancer: a randomised, phase 3, equivalence trial

Frank A Vicini, Reena S Cecchini, Julia R White, Douglas W Arthur, Thomas B Julian, Rachel A Rabinovitch, Robert R Kuske, Patricia A Ganz, David S Parda, Michael F Scheier, Kathryn A Winter, Soonmyung Paik, Henry M Kuerer, Laura A Vallow, Lori J Pierce, Eleftherios P Mamounas, Beryl McCormick, Joseph P Costantino, Harry D Bear, Isabelle Germain, Gregory Gustafson, Linda Grossheim, Ivy A Petersen, Richard S Hudes, Walter J Curran Jr, John L Bryant, Norman Wolmark*

Lancet 2019; 394: 2155–64
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Summary

Background Whole-breast irradiation after breast-conserving surgery for patients with early-stage breast cancer decreases ipsilateral breast-tumour recurrence (IBTR), yielding comparable results to mastectomy. It is unknown whether accelerated partial breast irradiation (APBI) to only the tumour-bearing quadrant, which shortens treatment duration, is equally effective. In our trial, we investigated whether APBI provides equivalent local tumour control after lumpectomy compared with whole-breast irradiation.

If only 91% are alive, how can >95% be alive without local recurrence?

So this right-hand graph is misleading for both patients and physicians.

Cumulative local recurrence rate is a misleading and non-representative outcome — Example 5

The left-hand graph shows that only 60% are alive at 10 years. This being the case, how can 90% be alive without local failure as per the right-hand graph?

Self-contradictory

60% are alive

90 % are alive and free of local recurrence

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Clinical Investigation

Breast-Conserving Surgery Followed by Partial or Whole Breast Irradiation: Twenty-Year Results of a Phase 3 Clinical Study

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If only 60% are alive, how can 90% be alive and free of local recurrence?

So this right-hand graph is misleading for both patients and physicians.

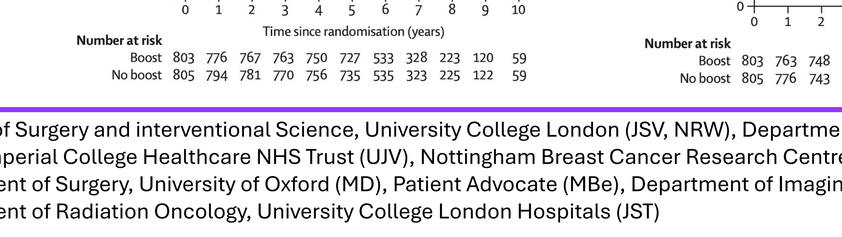
Cumulative local recurrence rate is a misleading and non-representative outcome — Example 6

The left-hand graph shows that only 80% are alive at 10 years. This being the case, how can 90% to 99% be alive without local failure as per the right-hand graph?

Self-contradictory

80% are alive

>90% are alive without local recurrence



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Breast-Conserving Surgery with or without Irradiation in Early Breast Cancer

Ian H. Kunkler, M.B., B.Chir., Linda J. Williams, Ph.D., Wilma J.L. Jack, M.B., Ch.B., David A. Cameron, M.D., and J. Michael Dixon, M.D.

If only 8% are alive, how can 90.5% or 99.5% be alive and free of local recurrence?

So this right-hand graph is misleading for both patients and physicians.
When the chance of being alive is only 80%, it is simply wrong to say that "You have a 90% or 99% chance of being (alive &) recurrence free"

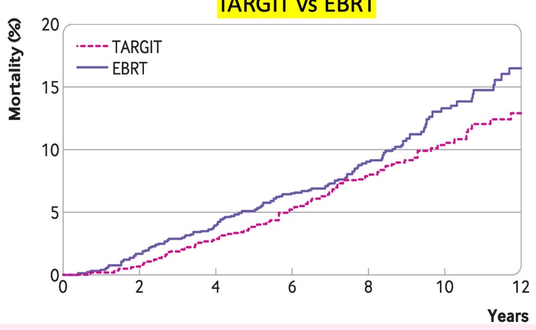
The right way: Example 1

thebmj | BMJ 2020;370:m2836 | doi: 10.1136/bmj.m2836

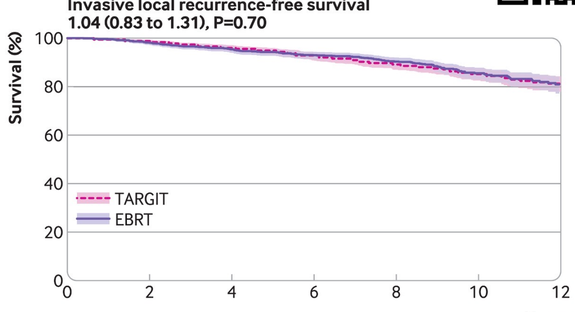
Long term survival and local control outcomes from single dose targeted intraoperative radiotherapy during lumpectomy (TARGIT-IORT) for early breast cancer: TARGIT-A randomised clinical trial

No contradiction: A true representation of reality for patients and clinicians

Overall mortality
87.1% or 83.6% alive
TARGIT vs EBRT



Invasive local recurrence-free survival
81% or 81% alive without local recurrence



Fewer deaths: (Improved overall survival in grade 1 or 2)

Local control: No difference

BJC British Journal of Cancer
Article | Open Access | Published: 25 May 2021
Clinical Studies

New clinical and biological insights from the international TARGIT-A randomised trial of targeted intraoperative radiotherapy during lumpectomy for breast cancer

British Journal of Cancer (2021) 125:380–389; https://doi.org/10.1038/s41416-021-01440-8

The right way: Example 2

Radiation doses and fractionation schedules in non-low-risk ductal carcinoma in situ in the breast (BIG 3–07/TROG 07.01): a randomised, factorial, multicentre, open-label, phase 3 study

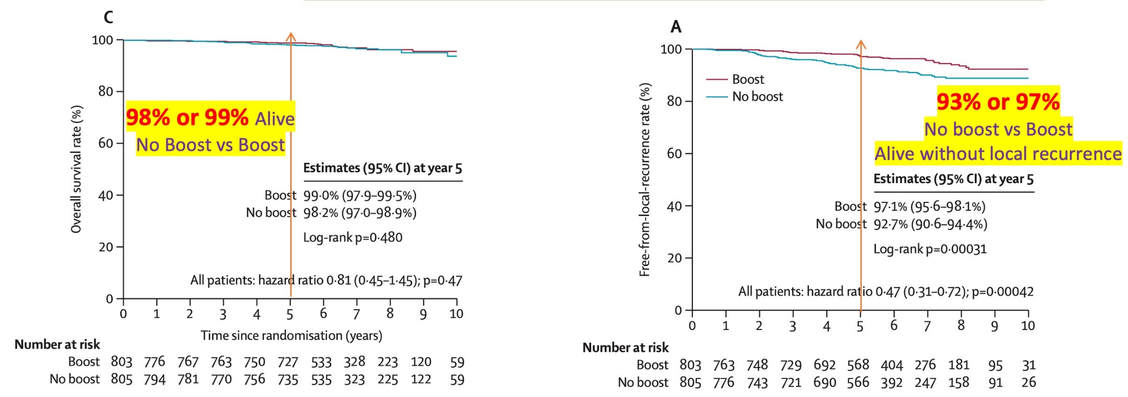
*Boon H Chua, Emma K Link, Ian H Kunkler, Timothy J Whelan, A Helen Westenberg, Guenther Gruber, Guy Bryant, Verity Ahern, Kash Purohit, Peter H Graham, Mohamed Akra, Orla McArdle, Peter O'Brien, Jennifer A Harvey, Carine Kirkove, John H Maduro, Ian D Campbell, Geoff P Delaney, Joseph D Martin, T Trinh T Vu, Thierry M Muanza, Anthony Neal, Ivo A Olivotto, on behalf of the BIG 3–07/TROG 07.01 trial investigators**

Lancet 2022; 400: 431–40
See Comment page 408
*BIG 3–07/TROG 07.01 trial investigators are listed in the

Summary

Background Whole breast irradiation (WBI) after conservative surgery for ductal carcinoma in situ (DCIS) reduces local recurrence. We investigated whether a tumour bed boost after WBI improved outcomes, and examined radiation dose fractionation sensitivity for non-low-risk DCIS.

No contradiction: A true representation of reality for patients and clinicians



The right way: Example 2

Division of Surgery and interventional Science, University College London (JSV, NRW), Department of Biostatistics, University of Notre Dame (MBu), Imperial College Healthcare NHS Trust (UJV), Nottingham Breast Cancer Research Centre, University of Nottingham (DM) Nuffield Department of Surgery, University of Oxford (MD), Patient Advocate (MBe), Department of Imaging, University College London (CBG), Department of Radiation Oncology, University College London Hospitals (JST)

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