

15 Anni di
bjclub breast
Journal
Club

L'IMPORTANZA DELLA RICERCA IN ONCOLOGIA

Padova 2024

04 Aprile

PALAZZO BO
Aula Nievo
Via VIII Febbraio, 2

05 Aprile

CENTRO ALTINATE
Auditorium
Via Altinate, 71



Highlights Setting Precoce **HER2+**

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Direttore Oncologia Medica senologica e ginecologica & Breast Unit
IRCCS Azienda Ospedaliero-universitaria di Bologna
Ospedale di Sant'Orsola

Disclosures

Advisory boards and/or travel accommodation

Roche, Eisai, Novartis, AstraZeneca, Pfizer, Pharmamar, Amgen, PierreFabre, Istituto Gentili, Lilly, Daiichi-Sankyo, Exact Sciences, MSD, GSK, Gilead, Seattle Genetics

Research funding to my Institution

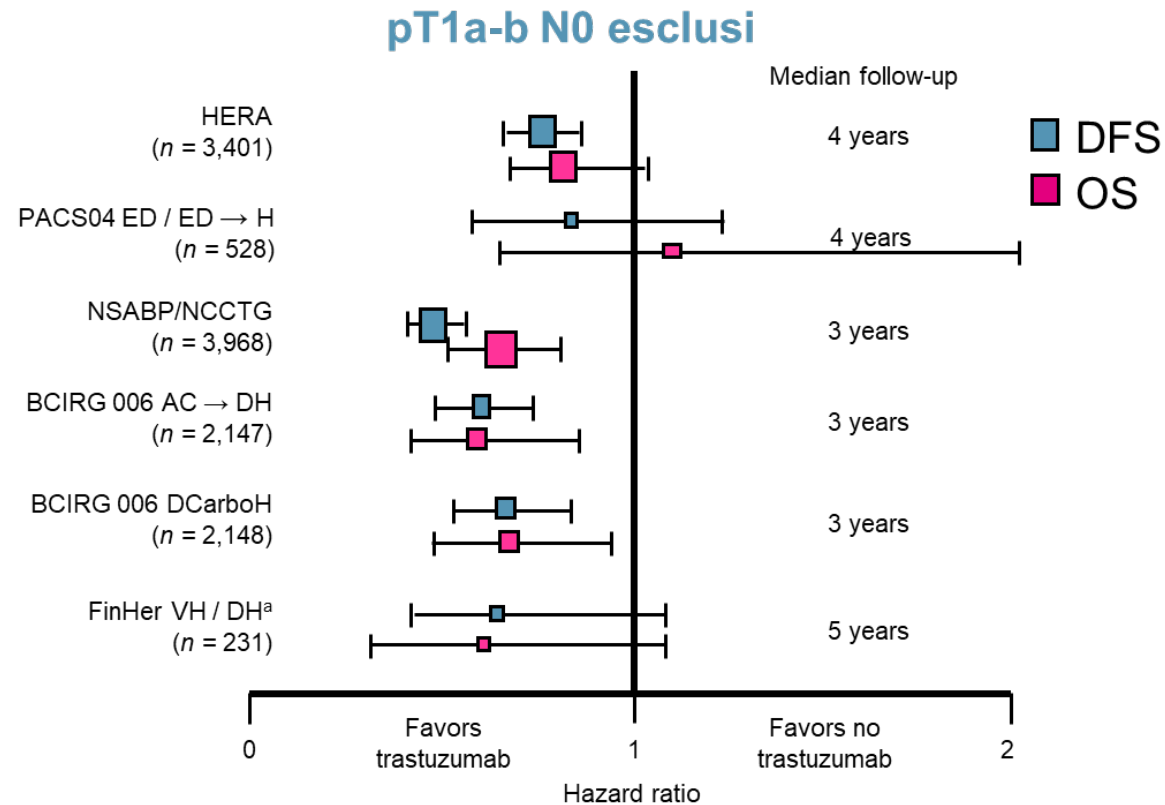
Roche, Eisai, Novartis, AstraZeneca, Pfizer, Pharmamar, AbbVie, Medivation, Array BioPharma, Synthron, Daiichi-Sankyo, Exact Sciences, MSD, GSK, Gilead, BMS, Seattle Genetics, Takeda, Teva

Tappe fondamentali della terapia anti HER-2

1998 l'inizio

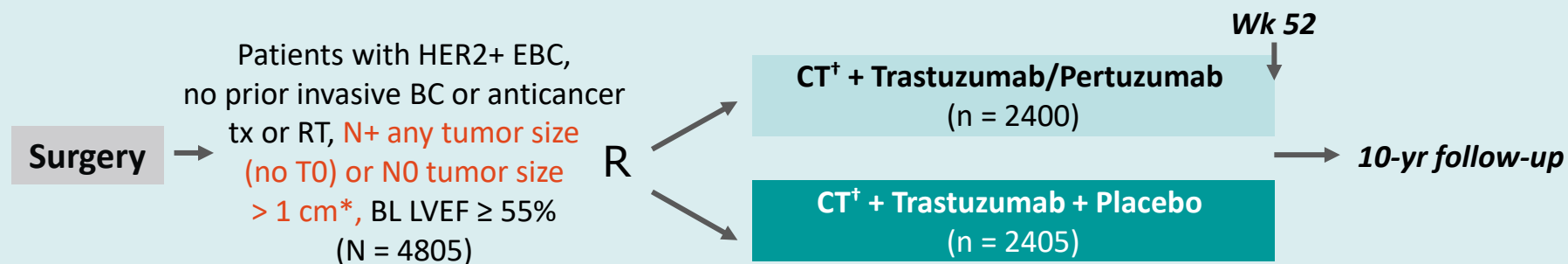
2005 la rivoluzione

Adjuvant Trastuzumab Trials >14,000 pts



APHINITY: Study Design

International, randomized, double-blind, placebo-controlled phase III trial ^[1]



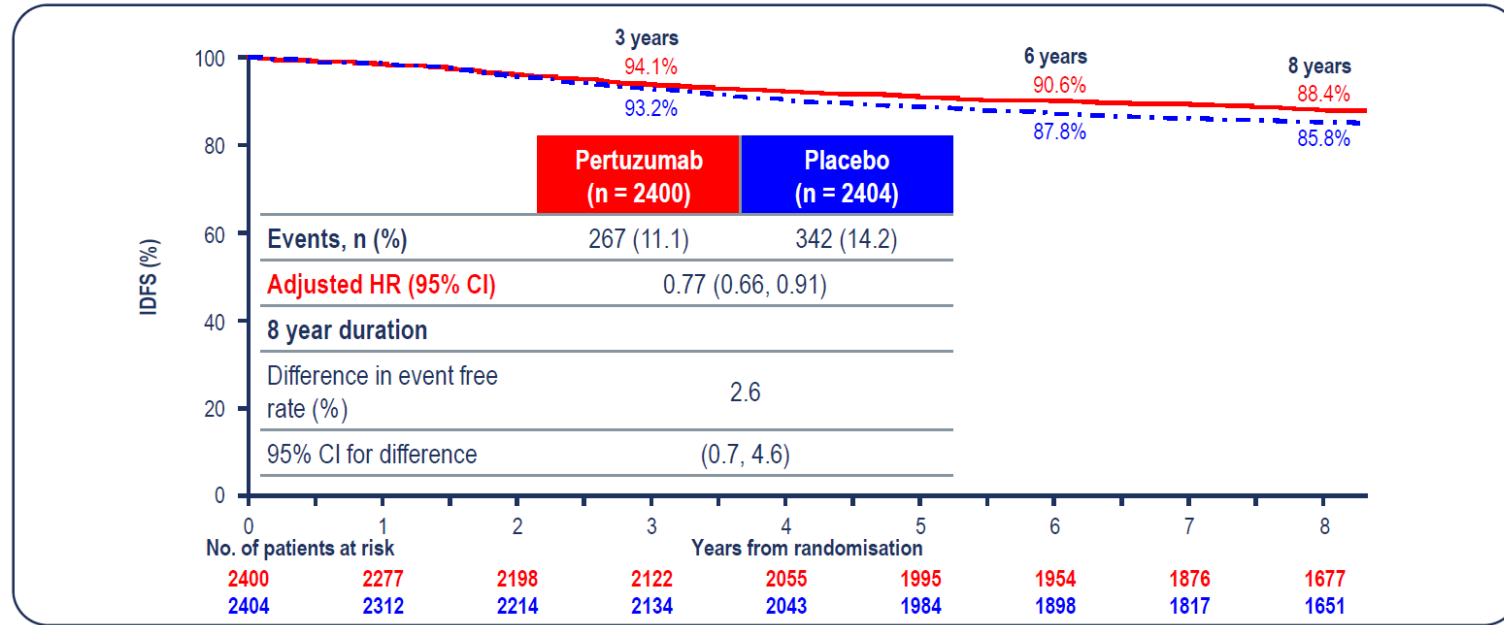
- Primary endpoint: IDFS per modified STEEP definition^[2] (excludes second primary non-BC as event)
- Secondary endpoints: IDFS per STEEP definition,^[2] OS, distant recurrence-free survival, DFS, recurrence-free interval, safety, cardiac safety, health-related QoL

*Or node negative with tumors > 0.5 to ≤ 1 cm + at least 1 of following: G3; ER and PgR neg; aged < 35 yrs.

Node-negative enrollment capped after first 3655 patients randomized.

†Tx initiated ≤ 8 wks post surgery. Permitted CT: standard anthracycline or nonanthracycline regimens (FEC x 3-4 → TH x 3-4; AC x 4 → TH x 4; or TCH x 6, followed by HER2-targeted therapy for total of 1 yr). Endocrine and/or radiotherapy. could be started at end of adjuvant CT.

APHINITY Updated Descriptive IDFS Analysis at 8.4 Years Median FU by Treatment Regimen - ITT population



Node-positive Cohort

Node-negative Cohort

	Pertuzumab (n = 1503)	Placebo (n = 1502)		Pertuzumab (n = 897)	Placebo (n = 902)
Events, n (%)	202 (13.4)	276 (18.4)	Events, n (%)	65 (7.2)	66 (7.3)
Unadjusted HR (95% CI)	0.72 (0.60, 0.87)		Unadjusted HR (95% CI)	1.01 (0.72, 1.42)	
8 year duration			8 year duration		
Difference in event free rate (%)	4.9		Difference in event free rate (%)	-1.0	
95% CI for difference	(2.2, 7.6)		95% CI for difference	(-3.5, 1.5)	

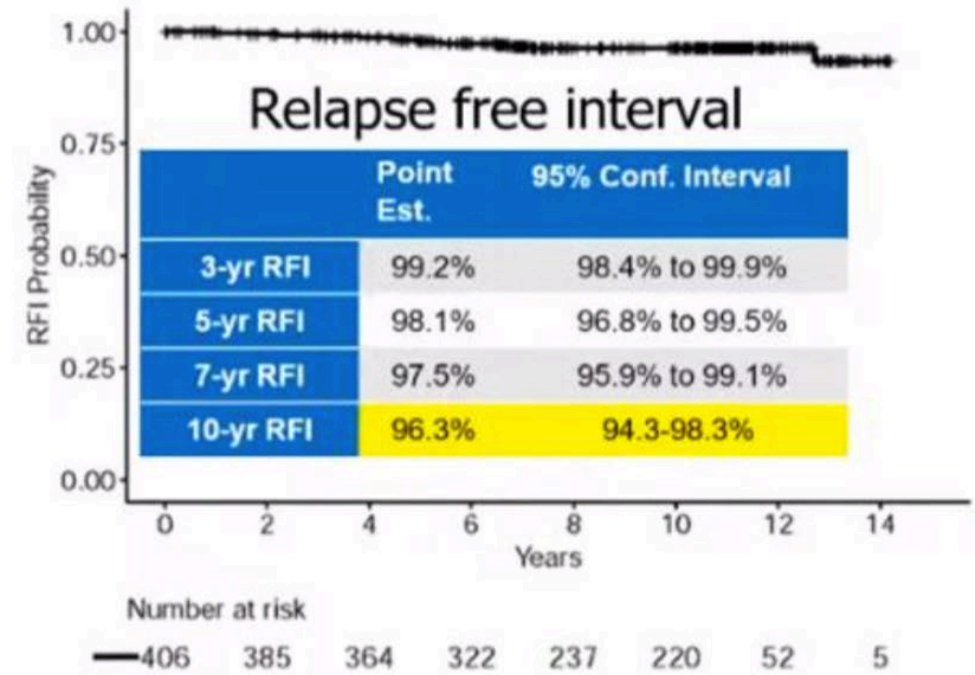
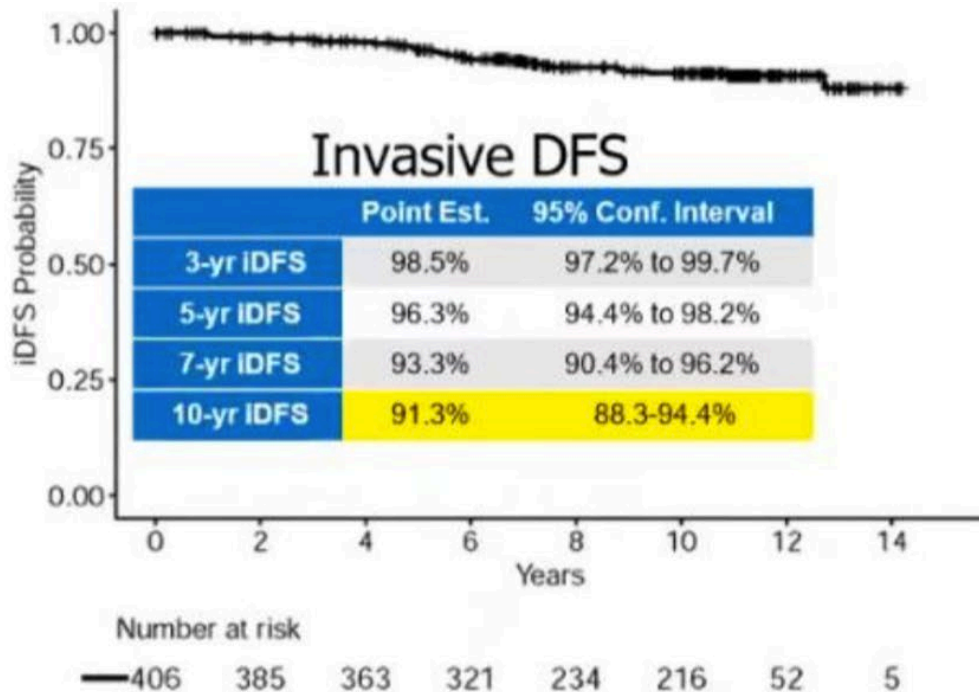
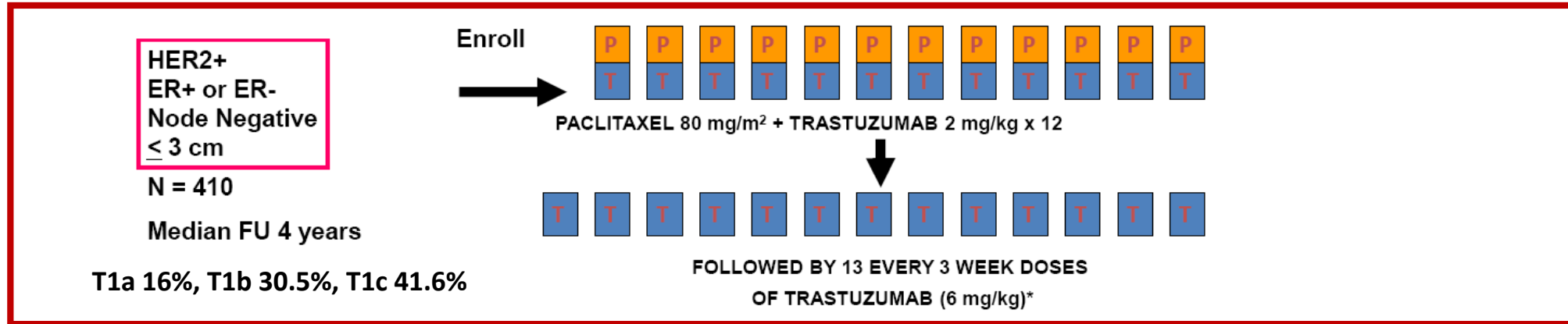
APHINITY Updated Descriptive Analysis

8.4 year median FU, Site of First Occurrence of an IDFS Event by Nodal Status

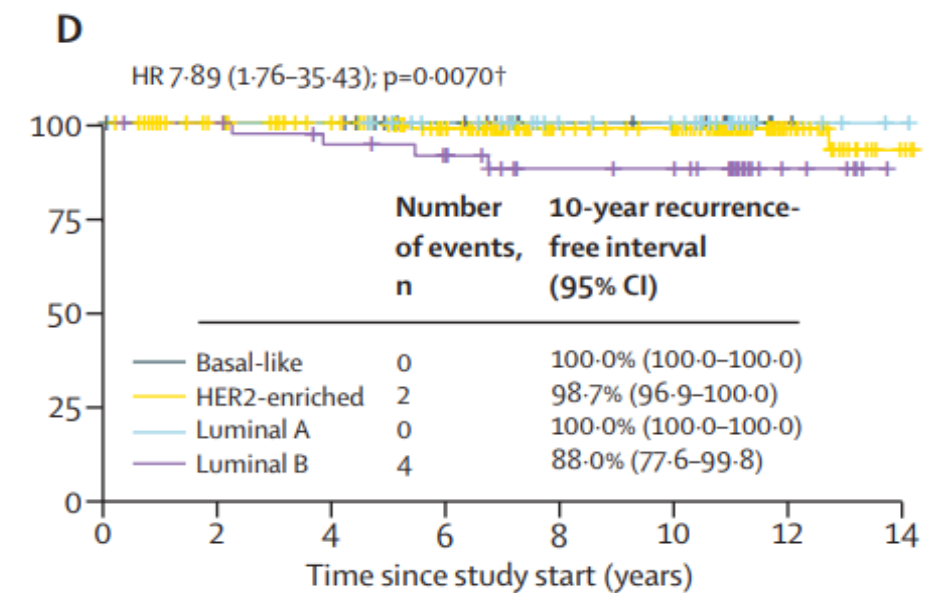
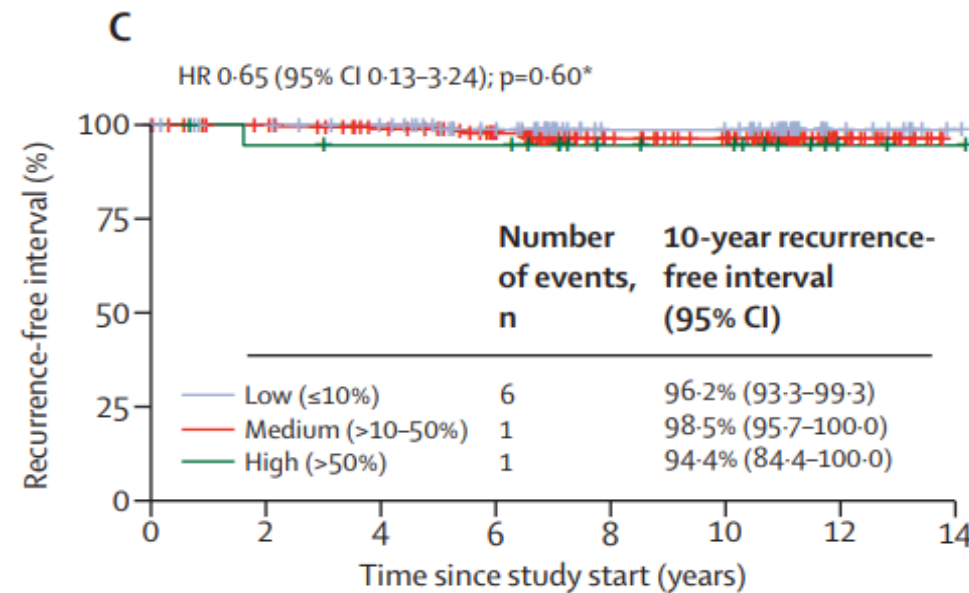
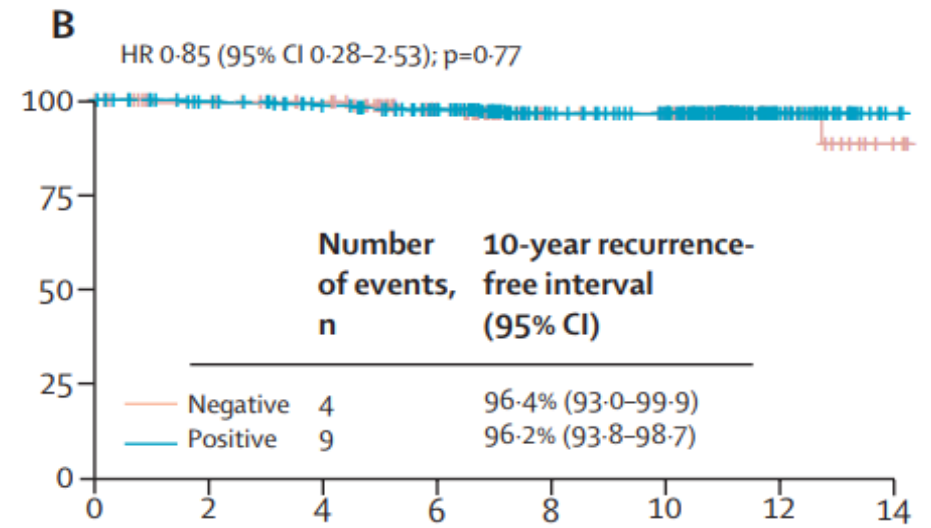
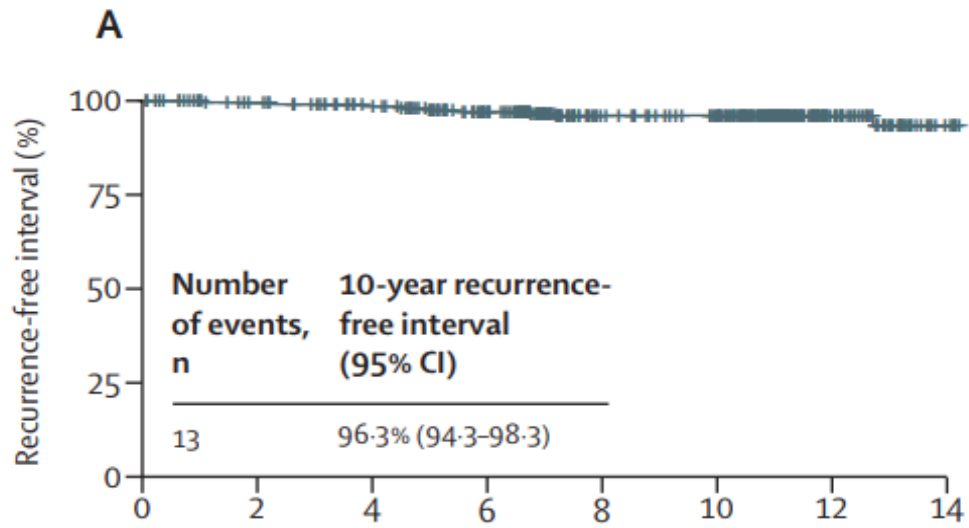


	Node-positive Cohort		Node-negative Cohort	
	Pertuzumab N=1503	Placebo N=1502	Pertuzumab N=897	Placebo N=902
Total patients with IDFS event: n (%)	202 (13.4%)	276 (18.4%)	65 (7.2%)	66 (7.3%)
Category of IDFS event: n (%)				
• Distant recurrence	131 (8.7%)	184 (12.3%)	18 (2.0%)	20 (2.2%)
• CNS metastases	43 (2.9%)	48 (2.9%)	8 (0.9%)	5 (0.6%)
• Locoregional BC recurrence	23 (1.5%)	39 (2.6%)	9 (1.0%)	18 (2.0%)
• Contralateral invasive BC recurrence	13 (0.9%)	16 (1.1%)	15 (1.7%)	6 (0.7%)
• Death without prior event	35 (2.3%)	37 (2.5%)	23 (2.6%)	22 (2.4%)

10y results of APT Chemotherapy de-escalated strategy



10-year recurrence-free interval overall (A) and by hormone receptor status (B), sTIL expression (C), and PAM50 subtype (D)

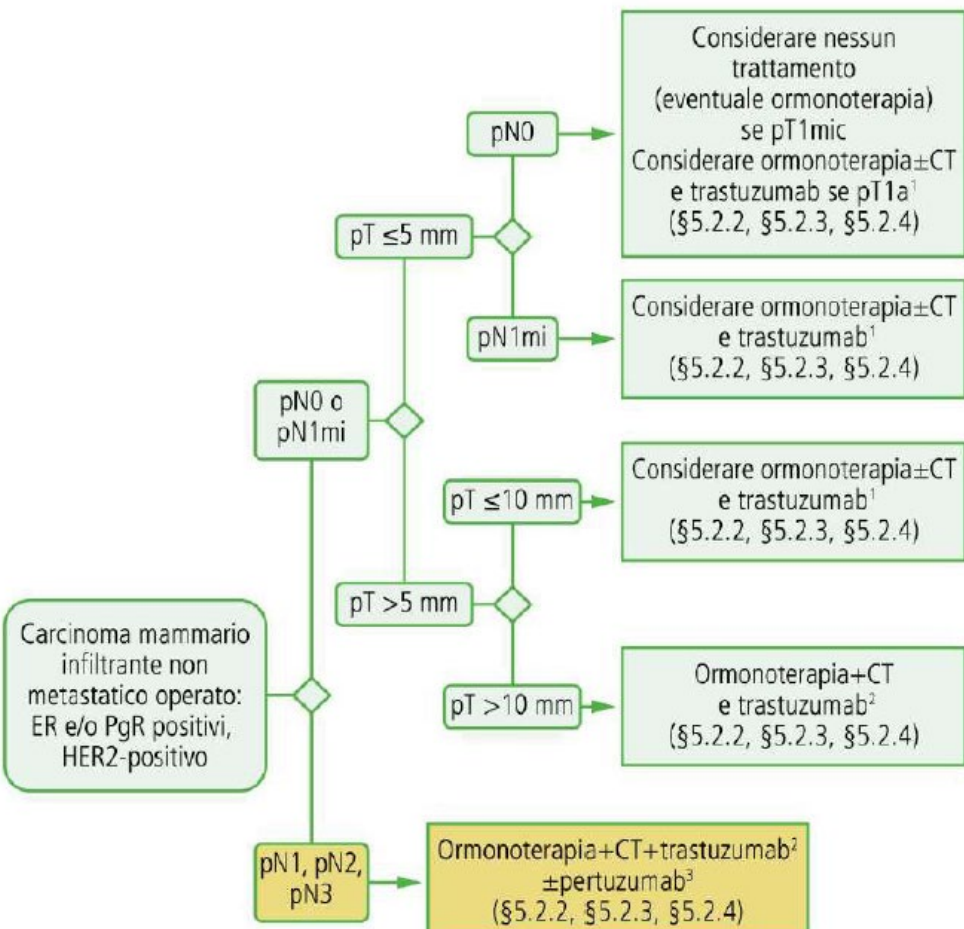


eBC HER2+

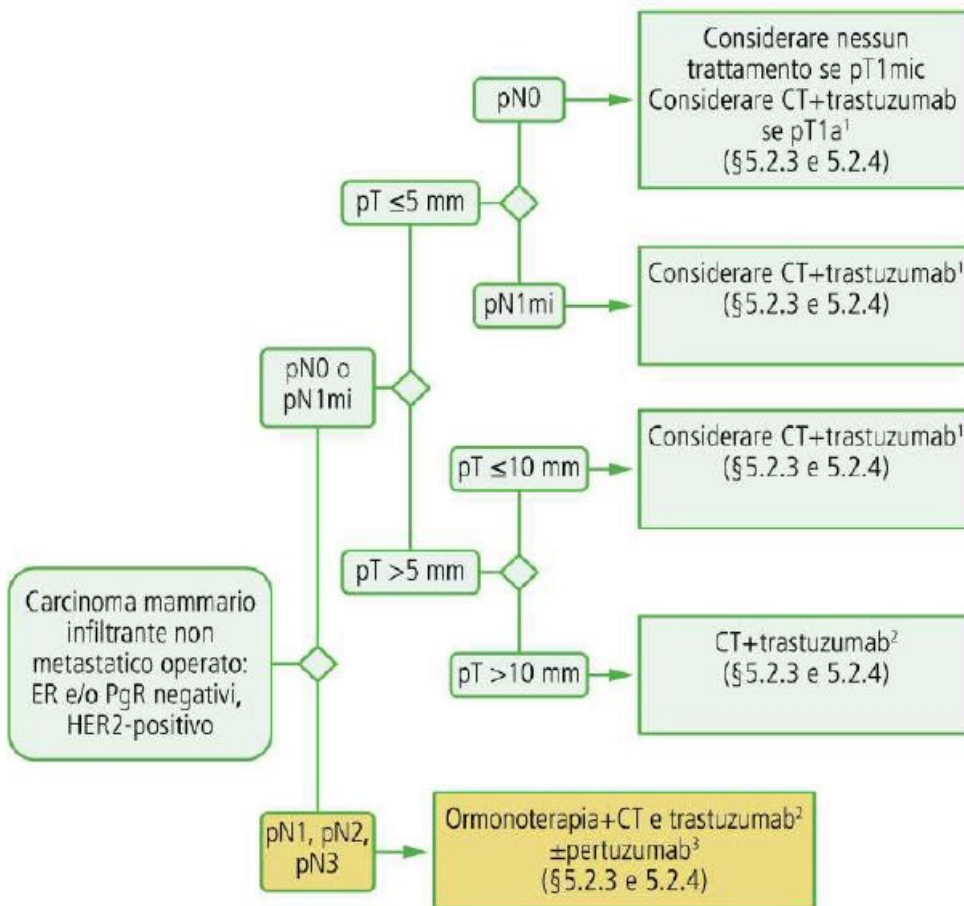
Terapia adiuvante LG AIOM 2023



ALGORITMO 5: CARCINOMA MAMMARIO INFILTRANTE NON METASTATICO OPERATO ER E/O PgR POSITIVO, HER2-POSITIVO: TERAPIA SISTEMICA ADIUVANTE



ALGORITMO 6: CARCINOMA MAMMARIO INFILTRANTE NON METASTATICO OPERATO ER E/O PgR NEGATIVI, HER2-POSITIVO: TERAPIA SISTEMICA ADIUVANTE



eBC HER2+ Terapia adiuvante 2024

Chemio + 1 anno trastuzumab*
(+ pertuzumab in N+)
(+/- ormonoterapia)

* concomitante > sequenziale

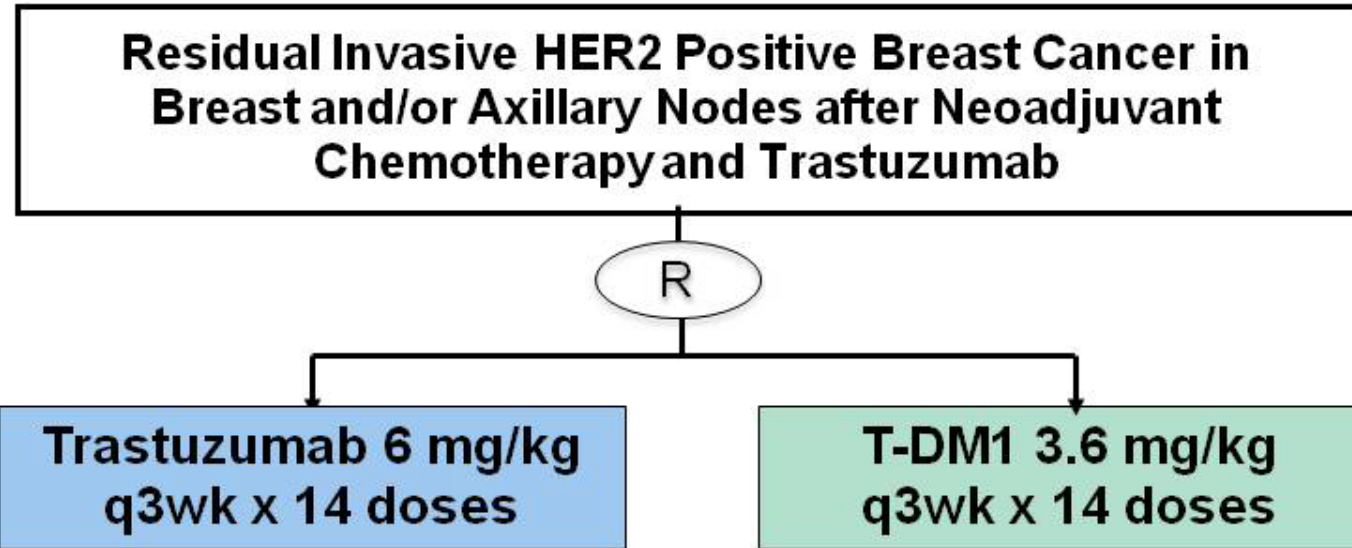
Quale chemioterapia?

E₉₀C x 4 → paclitaxel 80 mg/m²/w x 12 (o docetaxel/carboplatino x 6)

Paclitaxel 80 mg/m²/w x 12 in pT1 pN0 (compresi i pT1mi diffusi)

NSABP B-50-I/GBG 77/Roche BO27938

Katherine: Study Schema



Radiation per standard guidance; hormone therapy if ER or PR pos
Accrual goal - 1484 patients
Primary Endpoint: DFS

SLIDES ARE THE PROPERTY OF THE AUTHOR. PERMISSION REQUIRED FOR REUSE.

PRESENTED AT: ASCO Annual Meeting '15

T1-4, N0-3, M0 (T1a/bN0 not eligible)

Preoperative systemic treatment consisting of at least 6 cycles with a total duration of at least 16 weeks, including at least 9 weeks of trastuzumab and at least 9 weeks of taxane-based chemotherapy

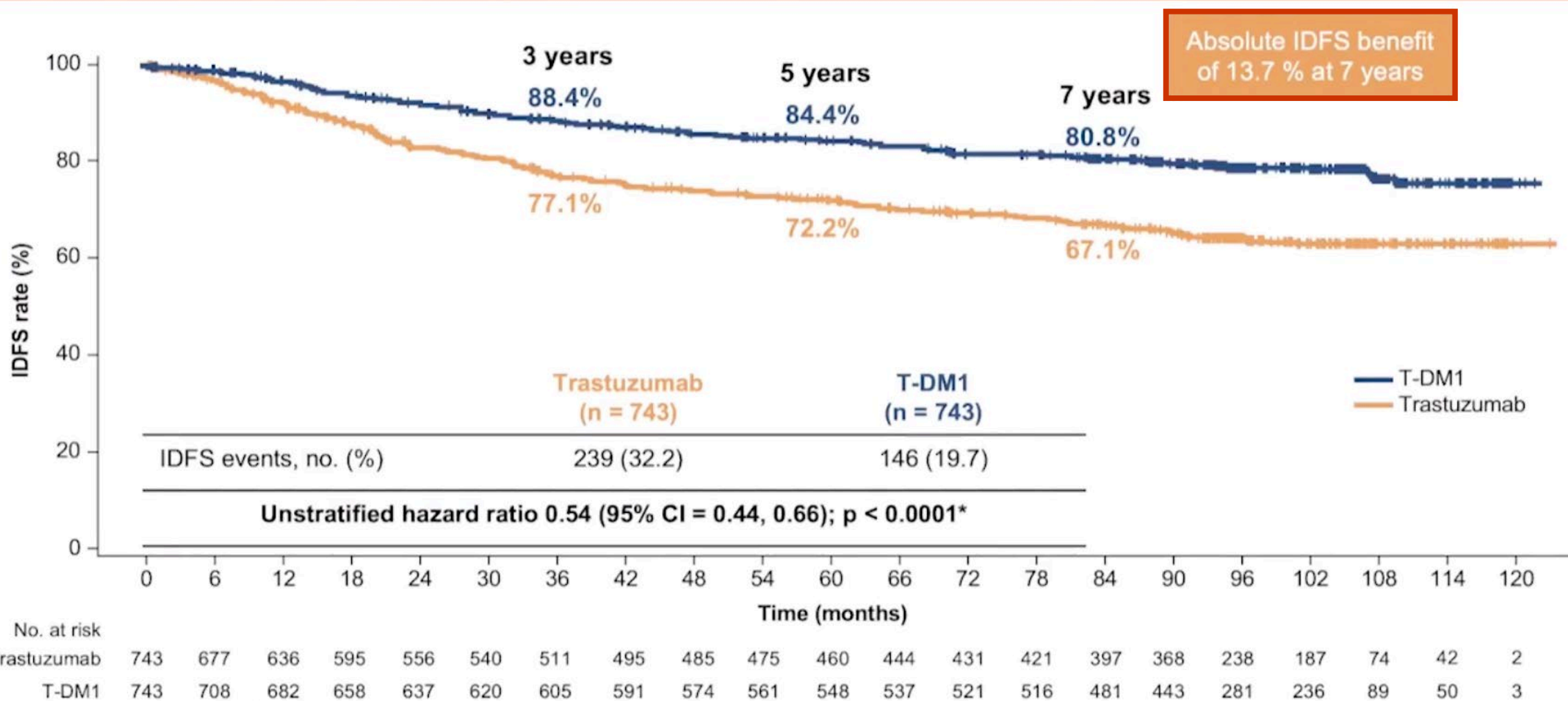
Note: HER2-directed therapy and chemotherapy may be given concurrently; patients may have received more than one HER2-directed therapy. Patients may have received an anthracycline as part of preoperative therapy

von Minckwitz G et al ASCO 2015
von Minckwitz G et al NEJM 2019

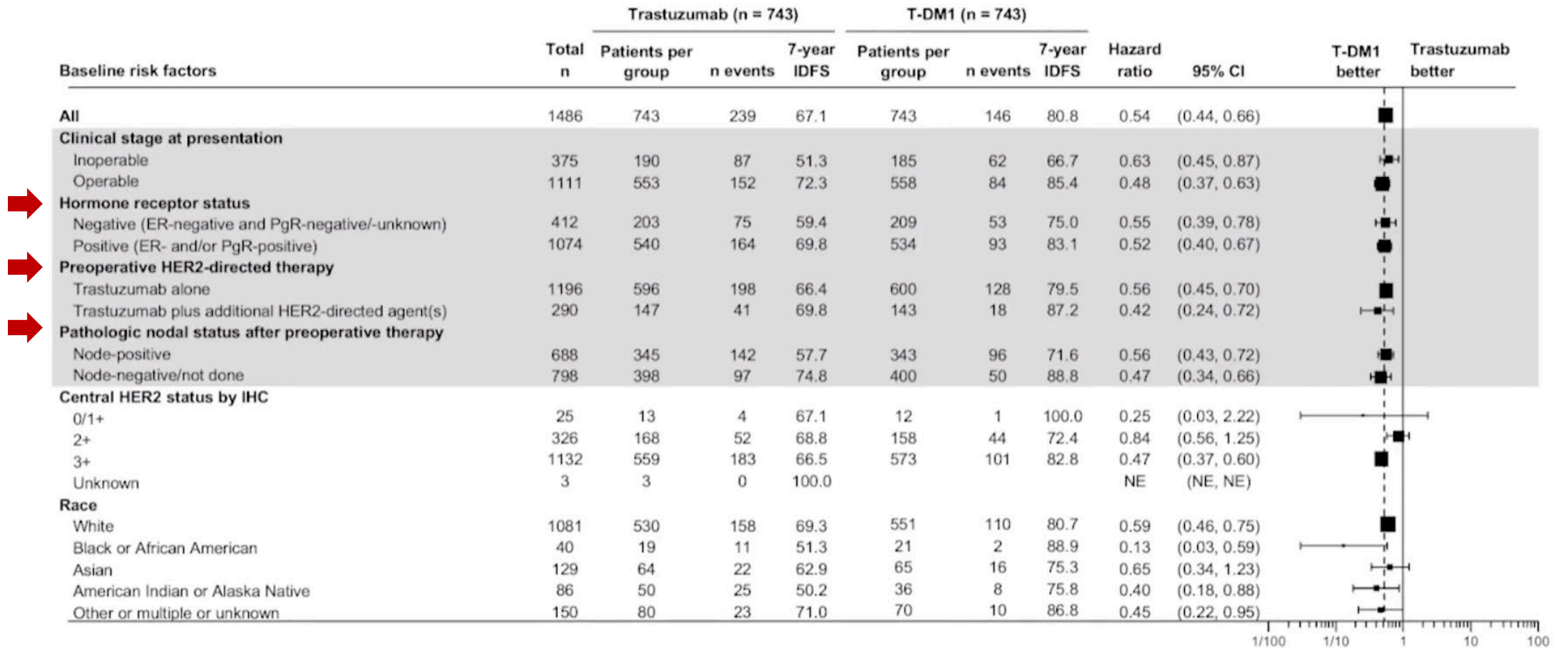
Katherine Characteristics of the Patients

Table 1. Demographic and Clinical Characteristics of the Patients at Baseline.*		
Characteristic	Trastuzumab Group (N = 743)	T-DM1 Group (N = 743)
Median age (range) — yr	49 (23–80)	49 (24–79)
Race or ethnic group — no. of patients (%)†		
White	531 (71.5)	551 (74.2)
Asian	64 (8.6)	65 (8.7)
Black	19 (2.6)	21 (2.8)
American Indian or Alaska Native‡	50 (6.7)	36 (4.8)
Multiple or unknown	79 (10.6)	70 (9.4)
Clinical stage at presentation — no. of patients (%)		
Inoperable breast cancer§	190 (25.6)	185 (24.9)
Operable breast cancer¶	553 (74.4)	558 (75.1)
Hormone-receptor status — no. of patients (%)		
Estrogen-receptor–negative and progesterone-receptor–negative or status unknown	203 (27.3)	209 (28.1)
Estrogen-receptor–positive, progesterone-receptor–positive, or both	540 (72.7)	534 (71.9)
Previous use of anthracycline — no. of patients (%)	564 (75.9)	579 (77.9)
Neoadjuvant HER2-targeted therapy — no. of patients (%)		
Trastuzumab alone	596 (80.2)	600 (80.8)
Trastuzumab plus pertuzumab	139 (18.7)	133 (17.9)
Trastuzumab plus other HER2-targeted therapy	8 (1.1)	10 (1.3)

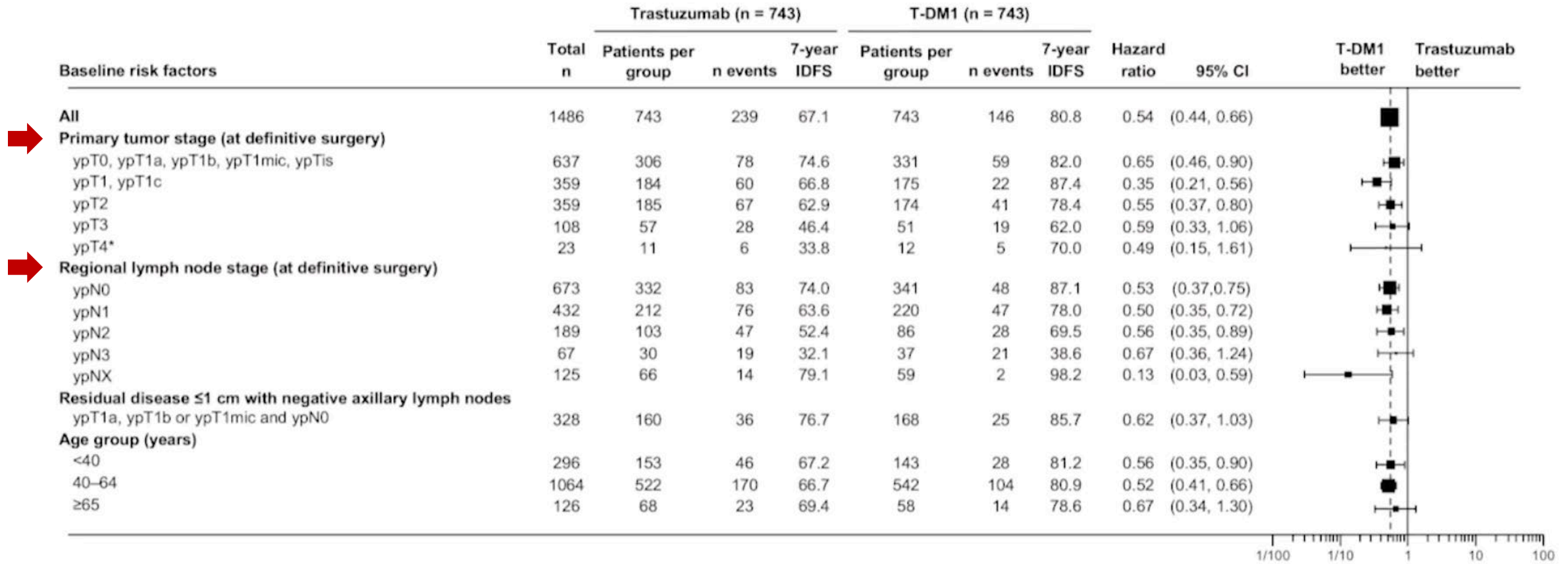
KATHERINE IDFS final analysis; median follow-up 8.4 years (101 months)



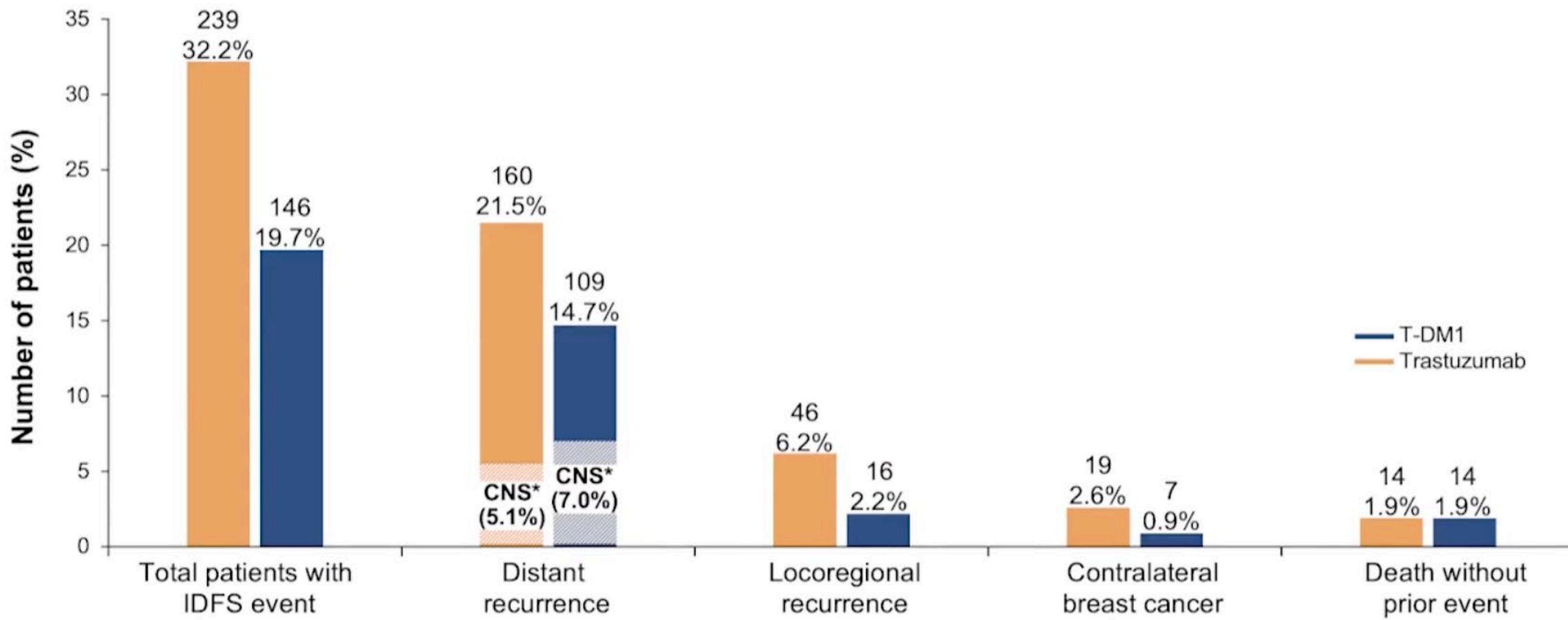
Final IDFS analysis: Subgroups (1/2)



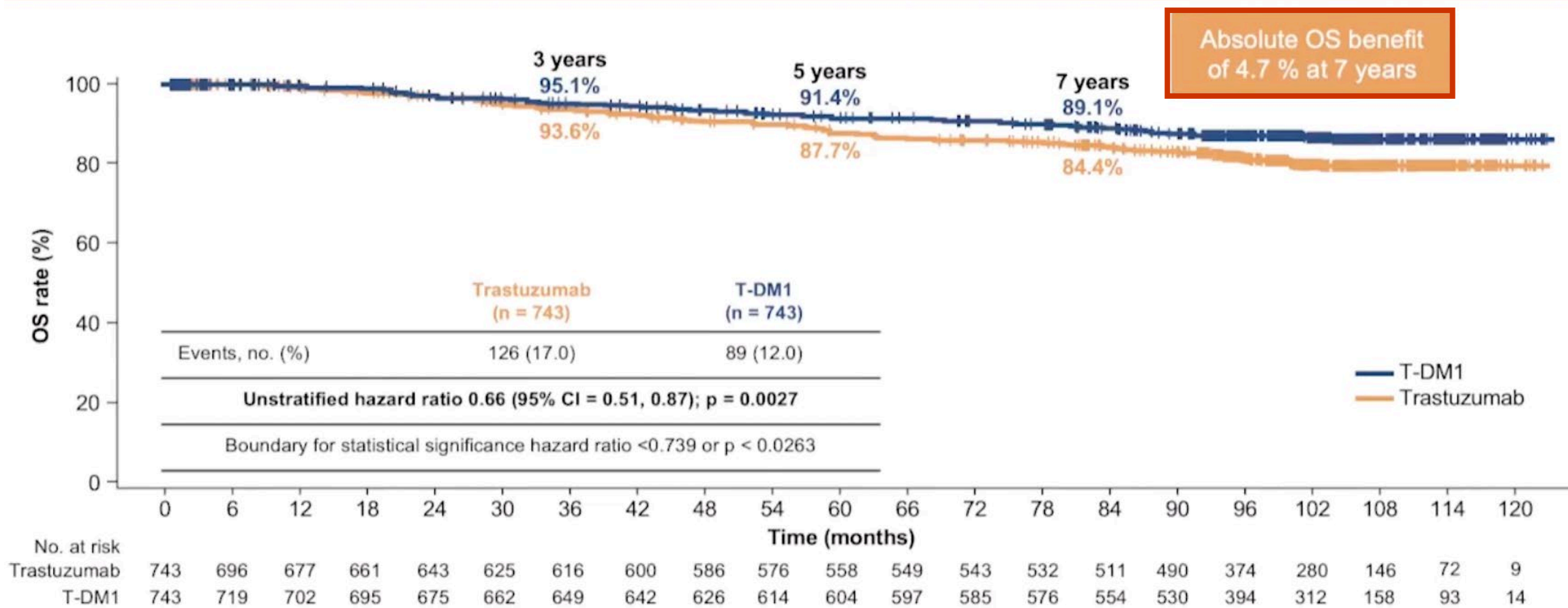
Final IDFS analysis: Subgroups (2/2)



Site of first occurrence of an IDFS event



KATHERINE 2nd OS interim analysis; median follow-up 8.4 years (101 months)

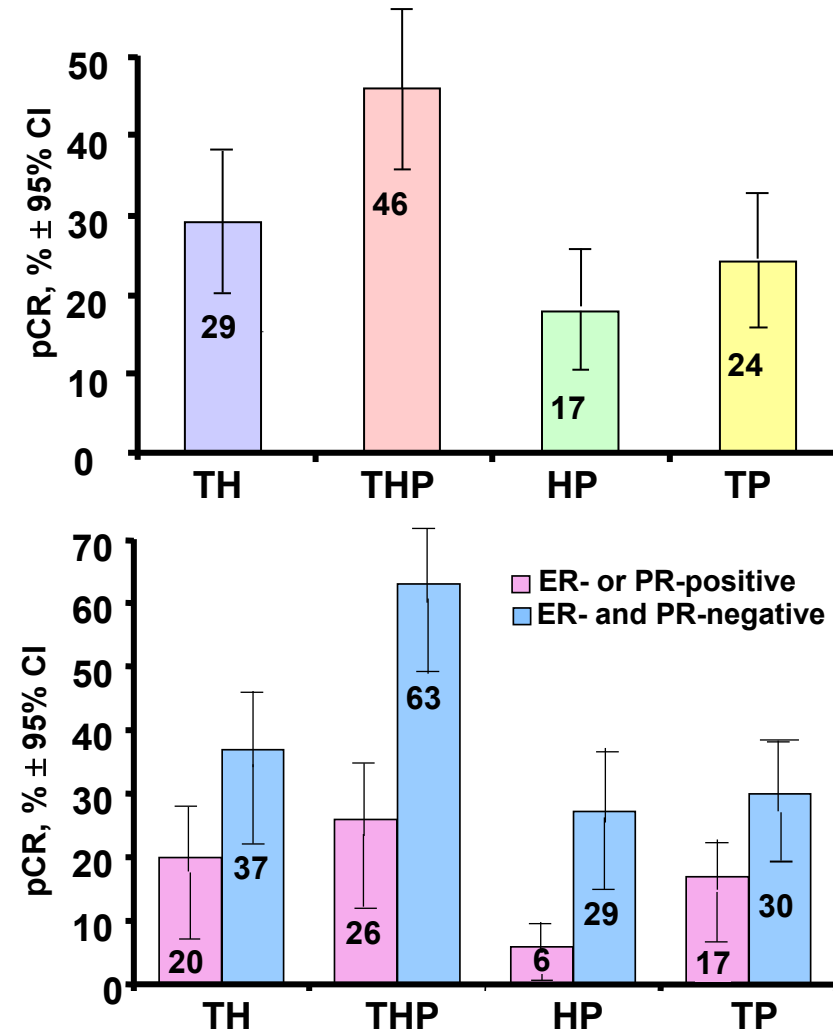
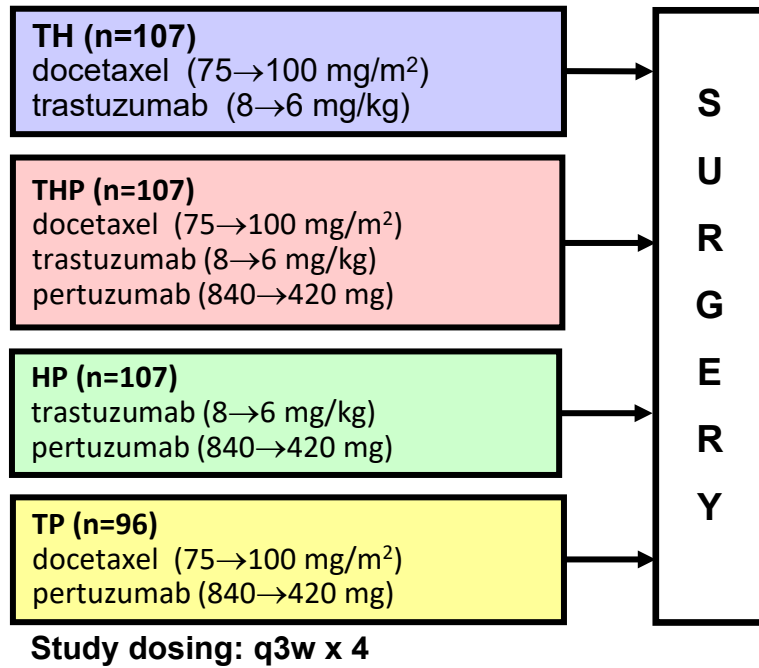


Implicazione chiave dello studio Katherine

L'ottenimento della pCR assume
importanza di per sé,
indipendentemente dal suo valore come
end-point surrogato di outcome

ADIUVANTE ↔ NEOADIUVANTE

NeoSphere: Study design and main results



Trastuzumab/pertuzumab vs trastuzumab pCR gain without incremental toxicity

Summary of the ten most common adverse events (any grade)

	Trastuzumab plus docetaxel (group A; n=107)	Pertuzumab, trastuzumab, and docetaxel (group B; n=107)
Alopecia	70 (65%)	68 (64%)
Neutropenia	67 (63%)	54 (50%)
Diarrhoea	36 (34%)	49 (46%)
Nausea	39 (36%)	41 (38%)
Fatigue	29 (27%)	28 (26%)
Rash	23 (21%)	28 (26%)
Mucosal inflammation	23 (21%)	28 (26%)
Myalgia	24 (22%)	24 (22%)
Asthenia	19 (18%)	22 (21%)
Headache	12 (11%)	12 (11%)

Data are n (%).

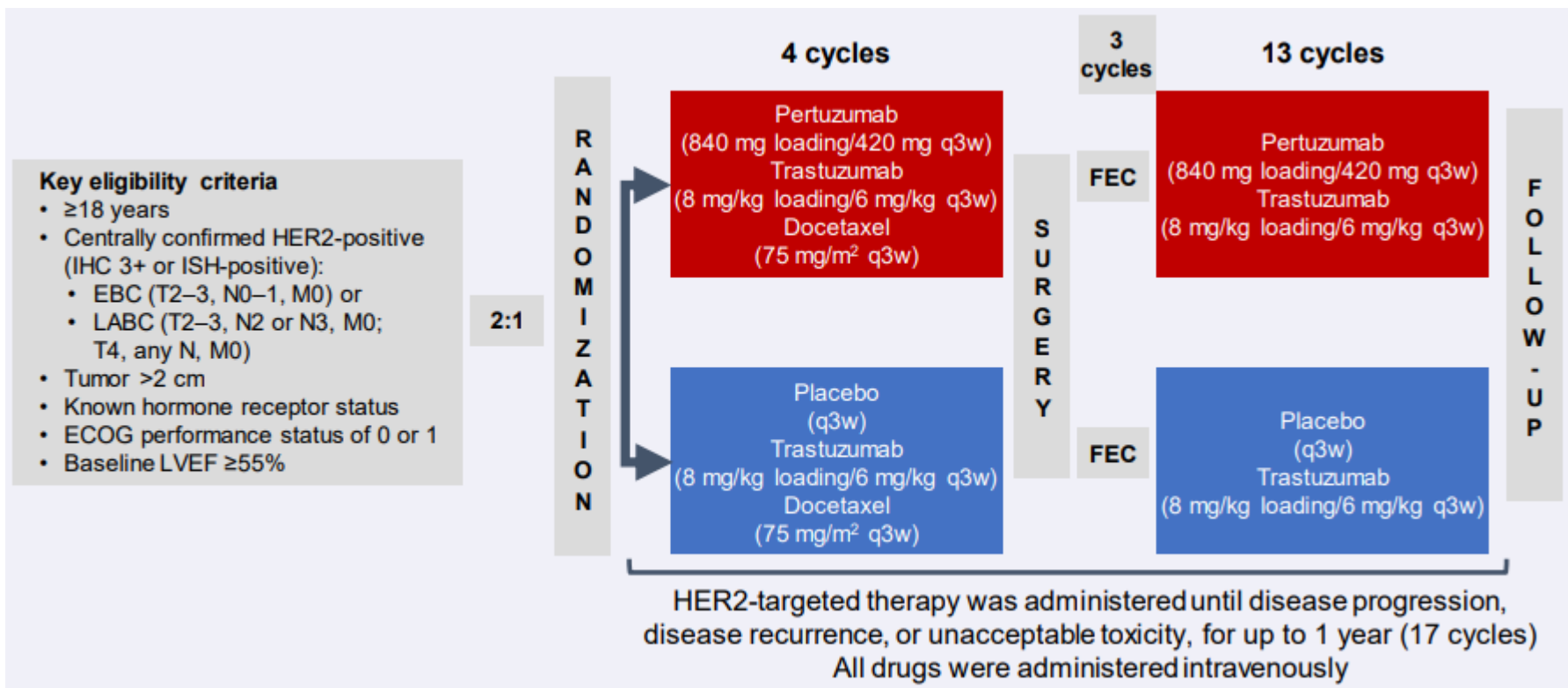
Most common adverse events of grade 3 or higher and serious adverse events

	Trastuzumab plus docetaxel (group A; n=107)	Pertuzumab, trastuzumab, and docetaxel (group B; n=107)
Neutropenia	61 (57%)	48 (45%)
Febrile neutropenia	8 (7%)	9 (8%)
Leucopenia	13 (12%)	5 (5%)
Diarrhoea	4 (4%)	6 (6%)
Asthenia	0	2 (2%)
Granulocytopenia	1 (1%)	1 (1%)
Rash	2 (2%)	2 (2%)
Menstruation irregular	1 (1%)	1 (1%)
Drug hypersensitivity	0	1 (1%)
ALT increased	3 (3%)	0
Total number of serious adverse events	20	15
Number of patients with ≥1 serious adverse events	18 (17%)	11 (10%)
Neutropenia	1 (1%)	4 (4%)
Febrile neutropenia	7 (7%)	6 (6%)
Neutropenic infection	0	1 (1%)
Neutropenic sepsis	1 (1%)	0
Pyrexia	1 (1%)	1 (1%)
Diarrhoea	2 (2%)	0
Congestive heart failure	0	0
Fulminant hepatitis	0	1 (1%)*
Other	8 (7%)	2 (2%)
Deaths	0	1 (1%)††

Efficacy, Safety, and Tolerability of Pertuzumab, Trastuzumab, and Docetaxel for Patients With Early or Locally Advanced ERBB2-Positive Breast Cancer in Asia

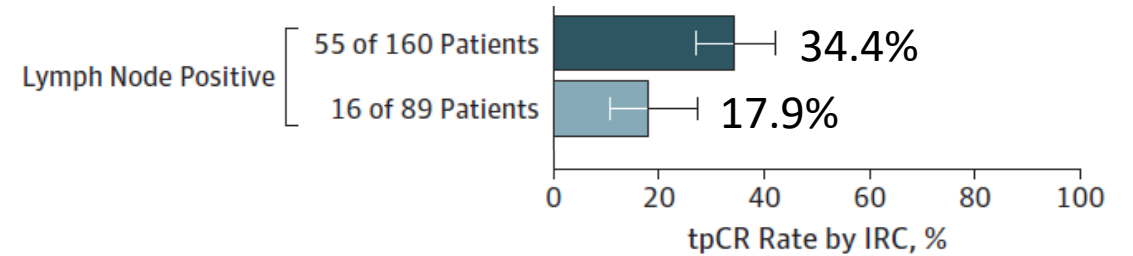
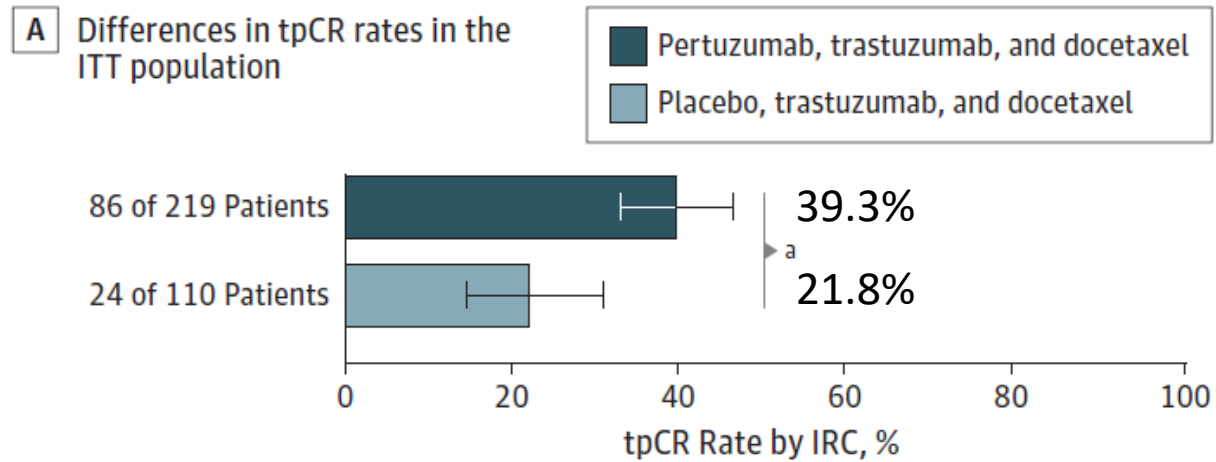
The PEONY Phase 3 Randomized Clinical Trial

Zhimin Shao, MD; Da Pang, MD; Hongjian Yang, MD; Wei Li, MD; Shusen Wang, MD; Shude Cui, MD; Ning Liao, MD; Yongsheng Wang, MD; Chuan Wang, MD; Yuan-Ching Chang, MD; Hweichung Wang, MD; Seok Yun Kang, MD; Jae Hong Seo, MD; Kunwei Shen, MD; Suphawut Laohawiriyakamol, MD; Zefei Jiang, MD; Junjie Li, MD; Julian Zhou, PhD; Betsy Althaus, PharmD; Yixiang Mao, MD; Jennifer Eng-Wong, MD

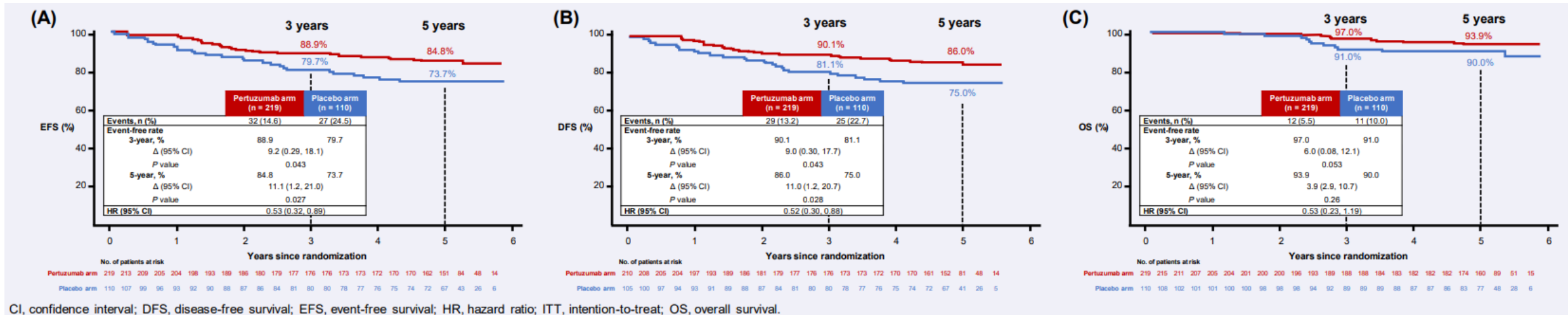


Primary endpoint of the Phase III PEONY trial: pCR

Figure 2. Efficacy Data



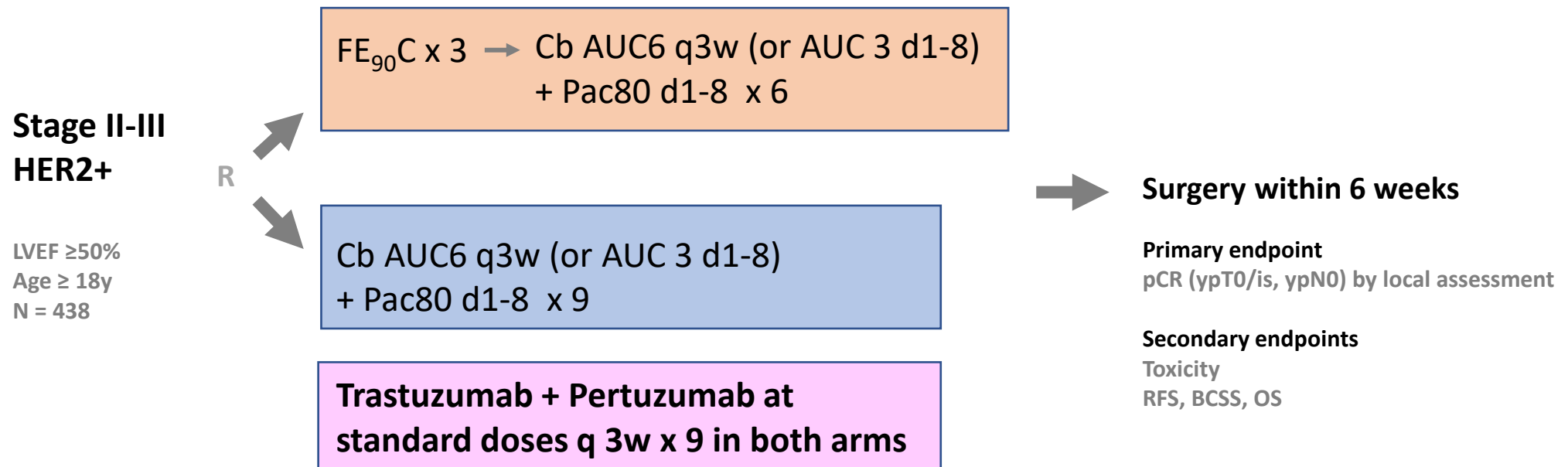
Final analysis of the Phase III PEONY trial: Long-term efficacy (ITT population)



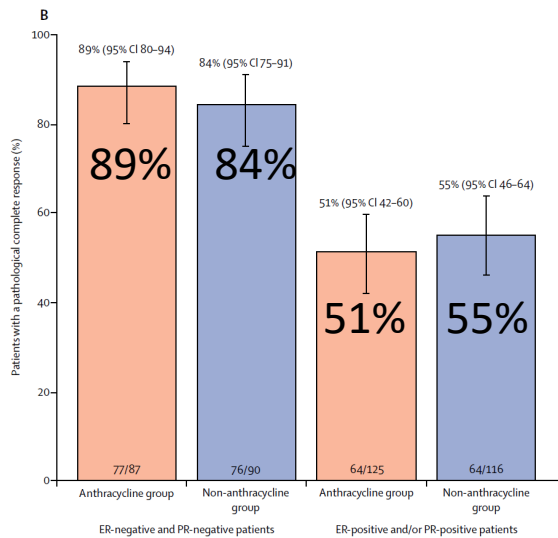
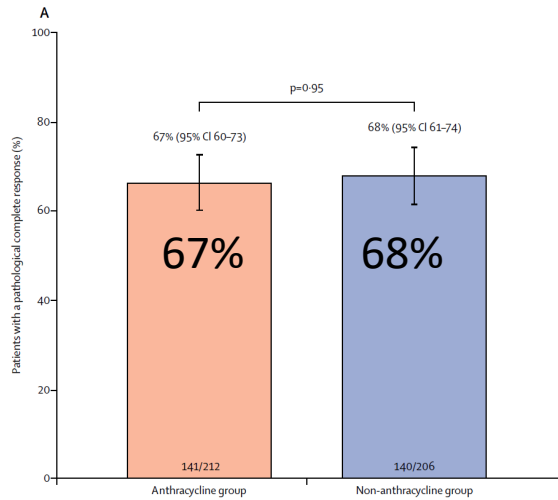
Neoadjuvant chemotherapy with or without anthracyclines in the presence of dual HER2 blockade for HER2-positive breast cancer (TRAIN-2): a multicentre, open-label, randomised, phase 3 trial

Lancet Oncol 2018; 19: 1630-40

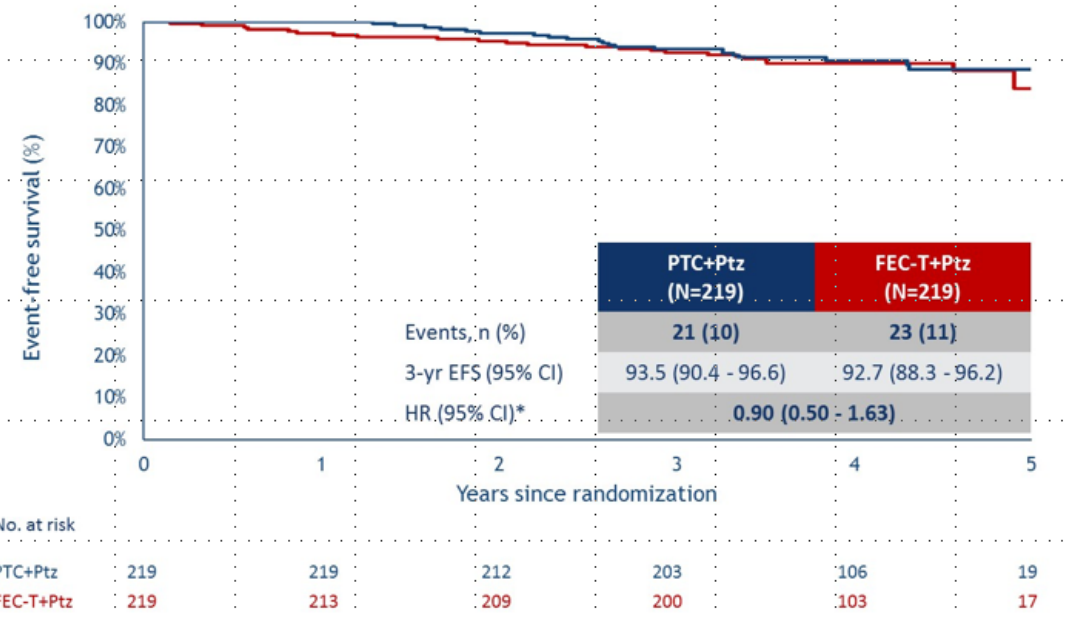
Mette S van Ramshorst, Anna van der Voort, Erik D van Werkhoven, Ingrid A Mandjes, Inge Kemper, Vincent O Dezentjé, Irma M Oving, Aafke H Honkoop, Lidwine W Tick, Agnes J van de Wouw, Caroline M Mandigers, Laurence J van Warmerdam, Jelle Wesseling, Marie-Jeanne T Vrancken Peeters, Sabine C Linn, Gabe S Sonke, on behalf of the Dutch Breast Cancer Research Group (BOOG)



TRAIN-2 Trial: pCR (ypT0/is ypN0) according to treatment and ER-PR status, and EFS



Event-free survival



Anna van der Voort ASCO 2020

van Ramshorst MS et al Lancet Oncol 2018

eBC HER2+ nel 2024 (opinione personale)

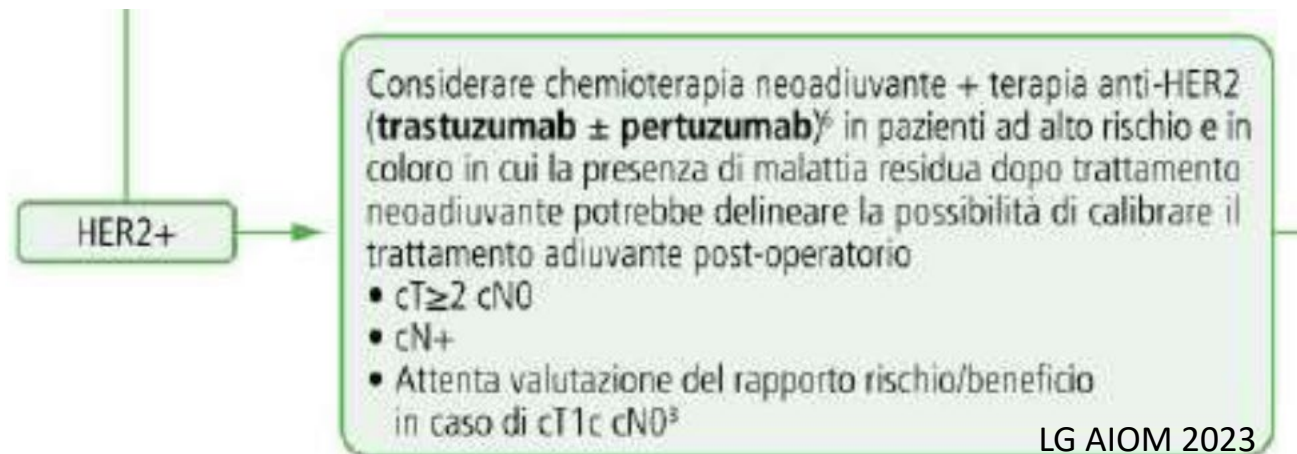
Approccio **neoadiuvante** in tutti gli stadi (esclusi cT1N0? parliamone!)

Tutta la chemioterapia* prima dell'intervento

*EC/AC → taxani *oppure* Platino/taxani

Trastuzumab e pertuzumab in neoadiuvante

Trastuzumab adiuvante nelle pCR; TDM1 se malattia residua (T e/o N)



eBC HER2+ : prospettive future

De-escalation

Possiamo ottenere gli stessi risultati,
riducendo il carico di effetti sfavorevoli?

Neoadjuvant treatment with trastuzumab and pertuzumab plus palbociclib and fulvestrant in HER2-positive, ER-positive breast cancer (NA-PHER2): an exploratory, open-label, phase 2 study

Luca Gianni, Giancarlo Bisagni, Marco Colleoni, Lucia Del Mastro, Claudio Zamagni, Mauro Mansutti, Milvia Zambetti, Antonio Frassoldati, Raffaella De Fato, Pinuccia Valagussa, Giuseppe Viale

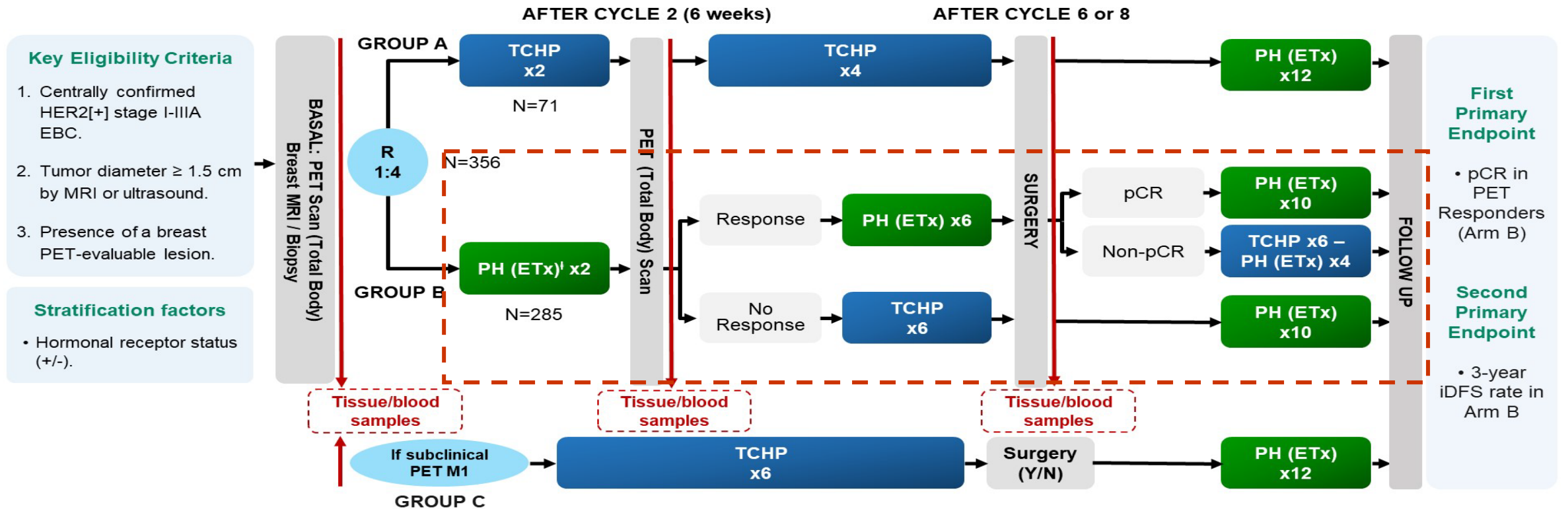
	Eligible patients (n=30)
Overall clinical response	29 (97% [83-100])
Complete clinical response	15 (50% [31-69])
Partial clinical response	14 (47% [28-64])
Stable disease	1 (3% [0-17])
Pathological complete response (no invasive cells in breast and axillary lymph nodes)	8 (27% [12-46])

Data are n (% [95% CI]).

Table 2: Clinical and pathological response

Early response evaluation to modulate the treatment strategy

PHERGain Study Design

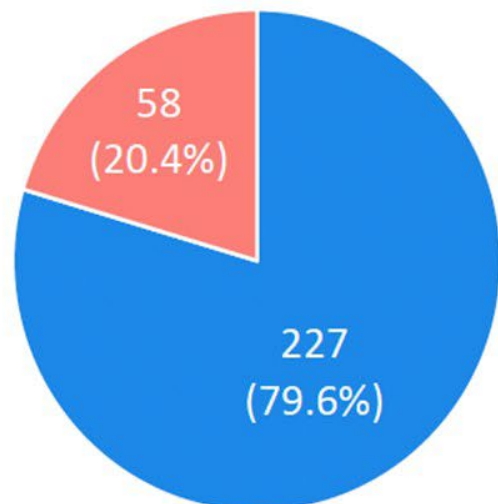


C: Carboplatin; D: Docetaxel; EBC: Early breast cancer; ETx: Endocrine therapy (letrozole post-menopausal/tamoxifen pre-menopausal), Adjuvant ETx up to 3 years from surgery; PET: ¹⁸F-fluorodeoxyglucose positron emission tomography/computed tomography; H: Trastuzumab SC; HER2: Human Epidermal Growth Factor Receptor 2; iDFS: Invasive disease-free survival; MRI: Magnetic resonance imaging; P: Pertuzumab IV; R: Randomization; TCHP: Trastuzumab, pertuzumab, docetaxel, and carboplatin. [†] All hormonal receptor-positive patients received ETx concomitantly with PH (except on chemotherapy).

- PET RESPONDERS: RECIST responders after cycle 2 with SUV_{max} reduction $\geq 40\%$.
- pCR, Pathological complete response (ypT0/isN0)

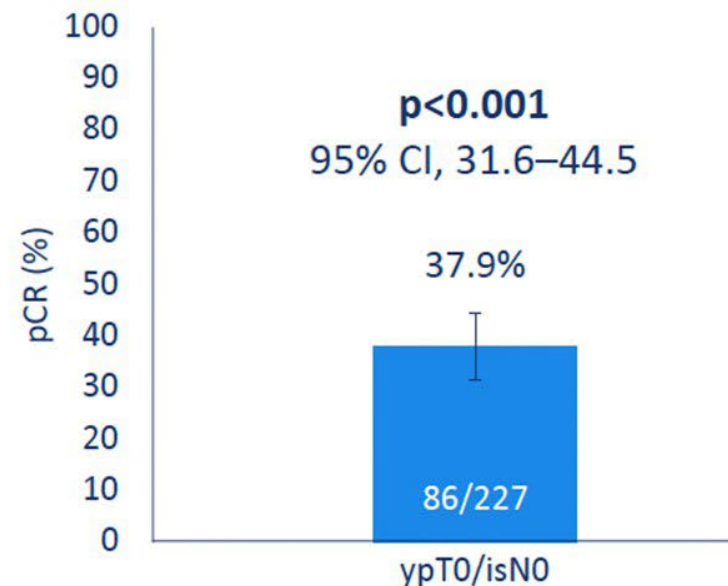
Primary Endpoint: pCR in ^{18}F -FDG-PET responders in group B

PET Responders and Non-Responders



■ PET Responder ■ PET Non-Responder

pCR rate



Null hypothesis: pCR \leq 20%

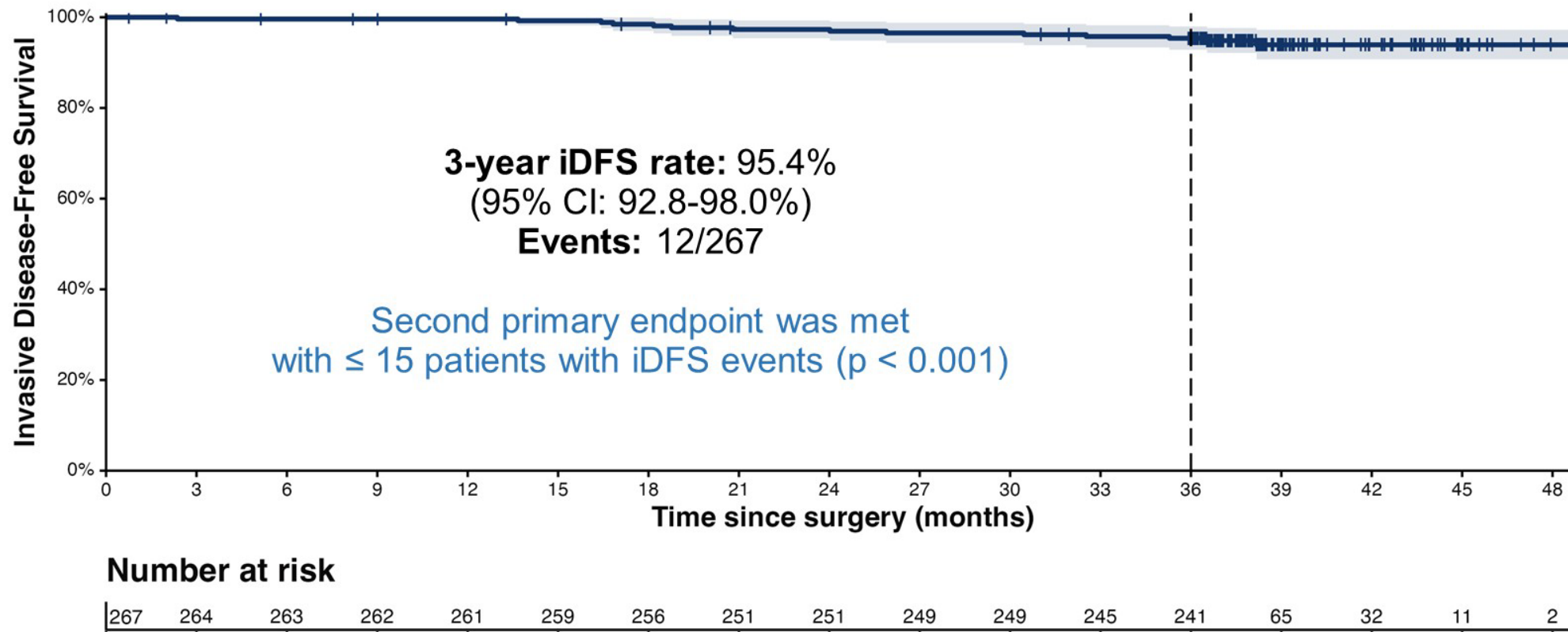
pCR was observed in patients with both HER2++ and HER2+++, pts with stage II and stage III, and pts ER+ and ER-.

Pérez-García, JM, et al. (2021). *Lancet Oncol*, 22(6), 858-871.

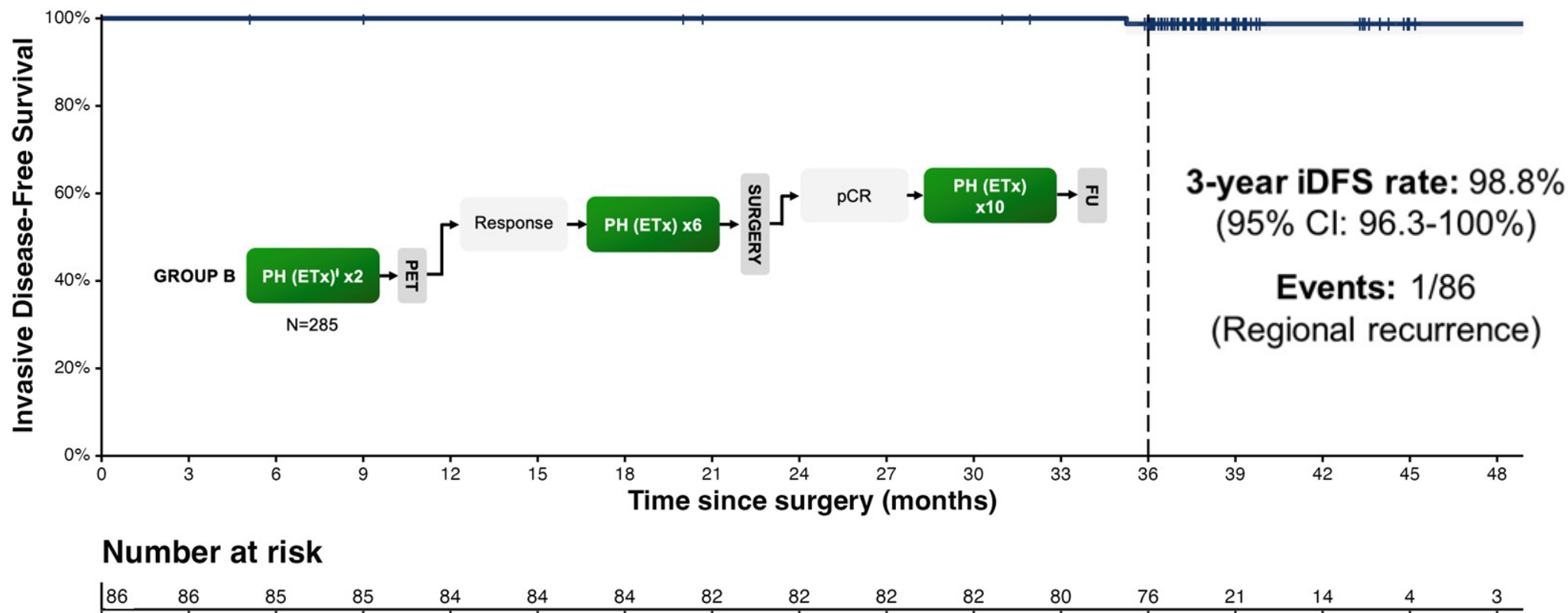
CI: Confidence interval; PET: ^{18}F -fluorodeoxyglucose positron emission tomography/computed tomography; pCR: Pathological complete response (ypT0/isN0).

Primary Endpoint: 3-year iDFS rate in group B

ITT population



Subgroup analysis: 3-year iDFS rate without CT in PET responders with pCR (n=86)



How to move toward escalated or de-escalated strategy at single patient level?

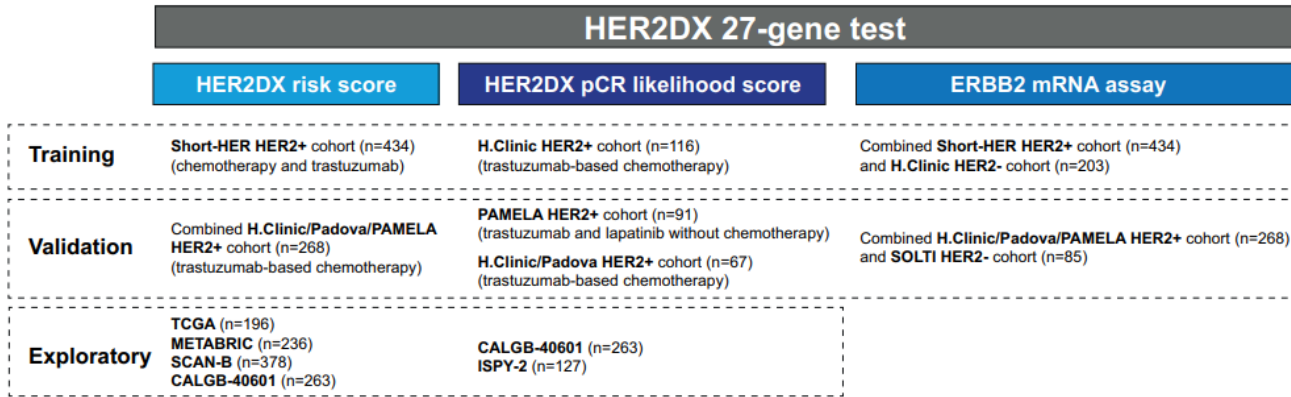
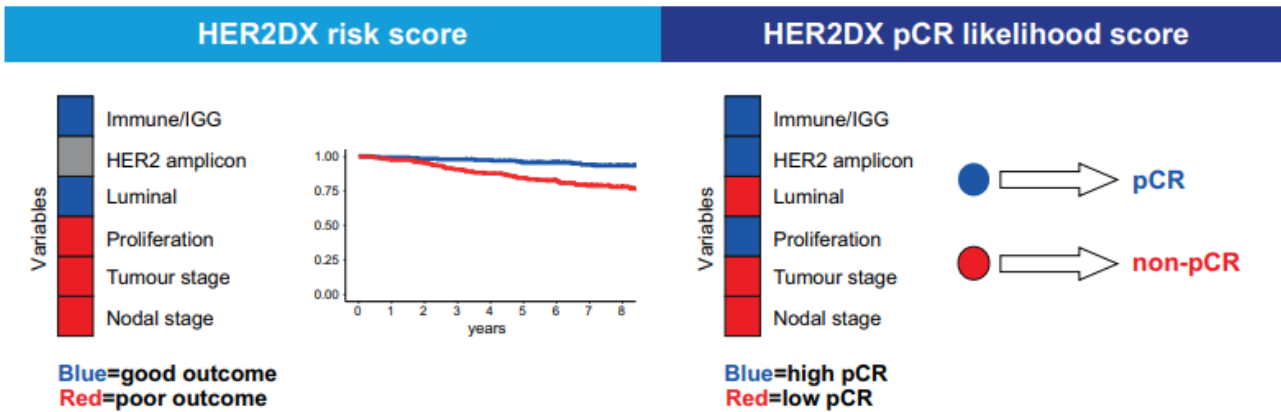
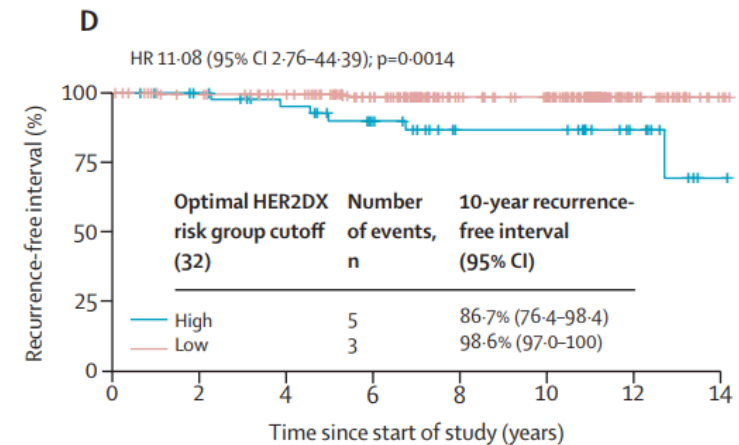
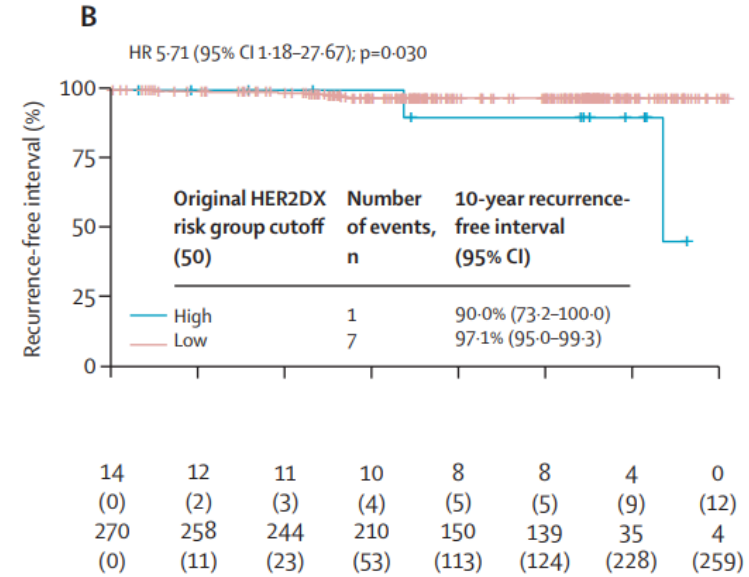


Figure 1. Summary of the different cohorts of patients evaluated during HER2DX development and validation.



Prat A, et al. Ebiomedicine 2021; Prat A, et al. Lancet Oncol 2020

APT trial 10-year recurrence free survival (B, D), stratified by HER2DX risk group

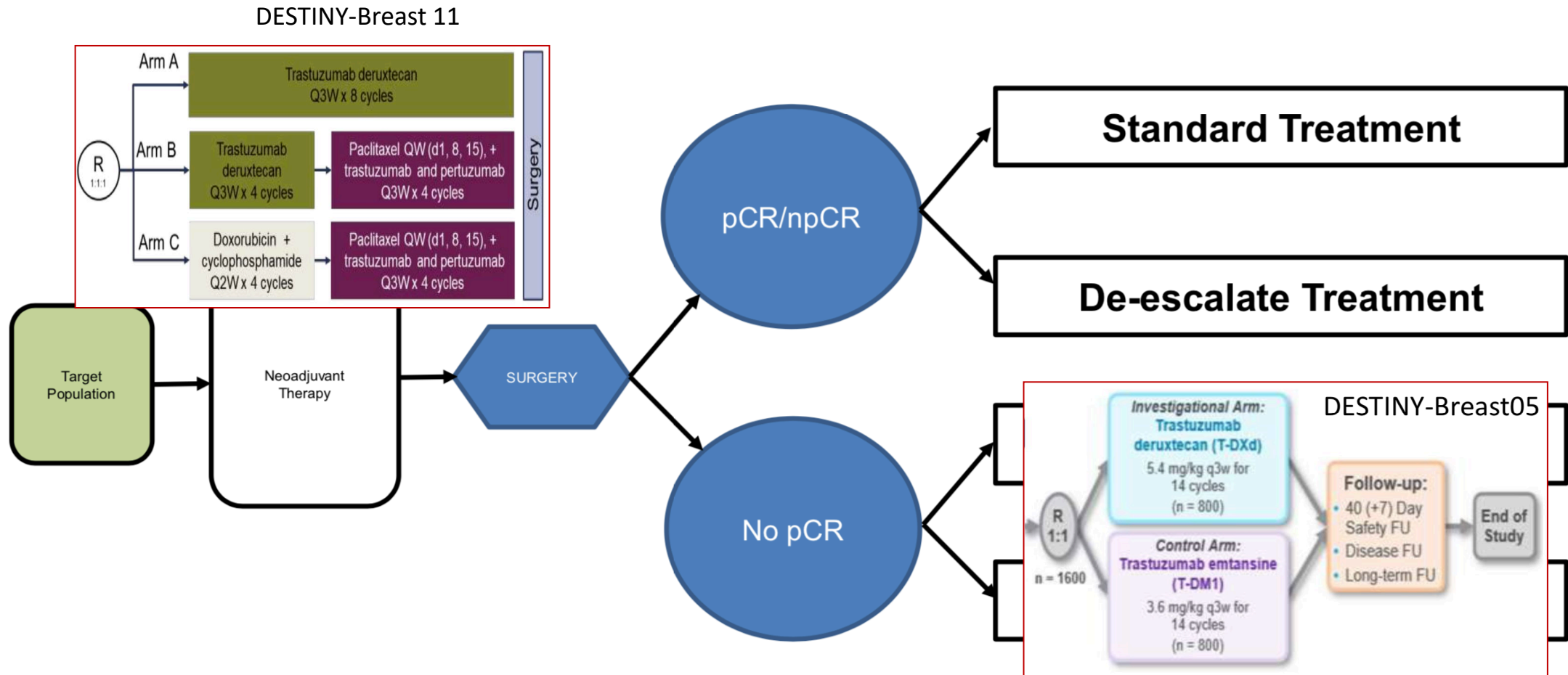


Tolaney S et al, Lancet Oncol 2023

eBC HER2+ : prospettive future

Escalation

Moving forward in treatment strategy personalization



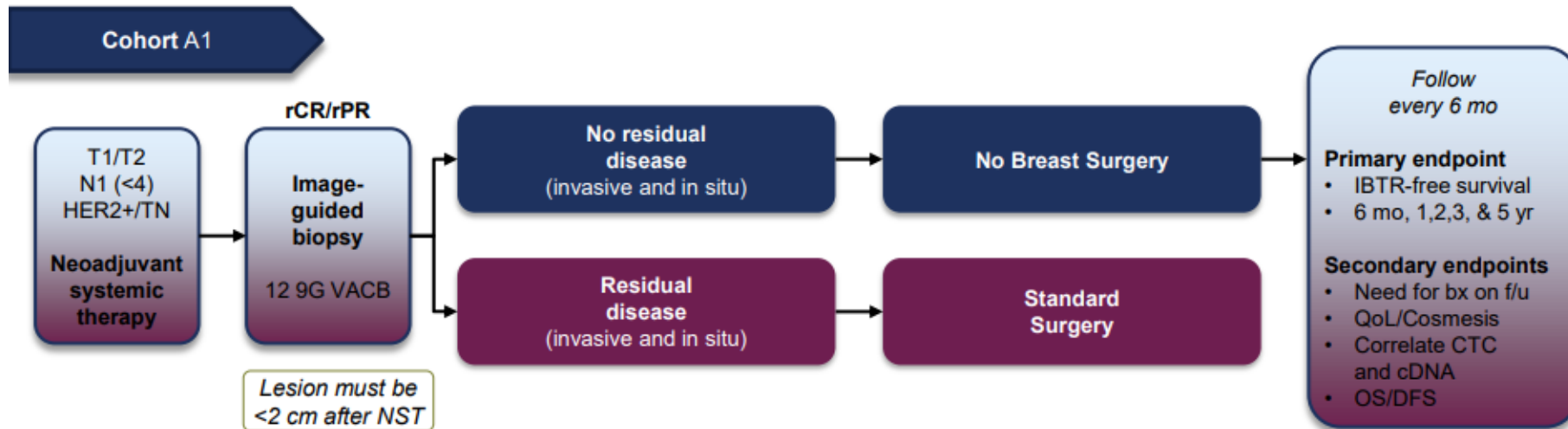
ph III - CompassHER2 RD, TDM1+ Tucatinib in residual disease after NAT

Eliminating breast surgery for invasive breast cancer in exceptional responders to neoadjuvant systemic therapy: a multicentre, single-arm, phase 2 trial

Henry M Kuerer, Benjamin D Smith, Savitri Krishnamurthy, Wei T Yang, Vicente Valero, Yu Shen, Heather Lin, Anthony Lucci, Judy C Boughey, Richard L White, Emilia J Diego, Gaiane M Rauch, on behalf of the Exceptional Responders Clinical Trials Group*

MD Anderson Multicenter Phase 2 Treatment Trial

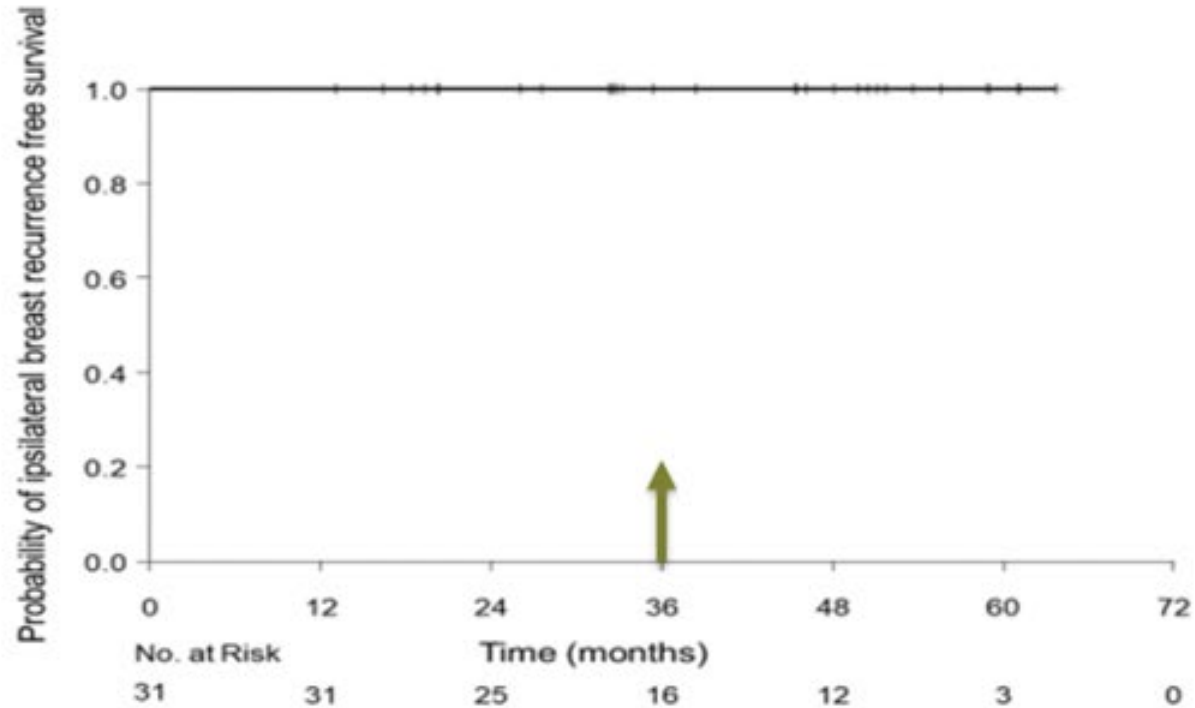
- Multicenter trial 2016-0046: *Eliminating Breast Cancer Surgery in Exceptional Responders With Neoadjuvant Systemic Therapy*
- MD Anderson Cancer Network, UPMC, Mayo Clinic, and Levine Cancer Institute



<https://clinicaltrials.gov/ct2/show/NCT02945579>

Kuerer et al, *Lancet Oncol* 2022

RESULTS: Primary objective IBTR-free survival among patients who did not undergo breast surgery 3-year planned analysis



100% IBTRFS

Secondary
100% OS/DFS

Median follow-up 38.4 months (IQR 27.6–51.8)

HER2+ eBC Highlights

Neoadiuvante > Adiuivante

- nella pratica clinica
- nella ricerca di strategie di potenziamento/depotenziamento (terapia sistemica & locale)

Definizione della risposta patologica

- ancora dicotomica, quindi margini di ulteriore miglioramento

Qualità/organizzazione Breast Unit

- imprescindibile per neoadiuvante