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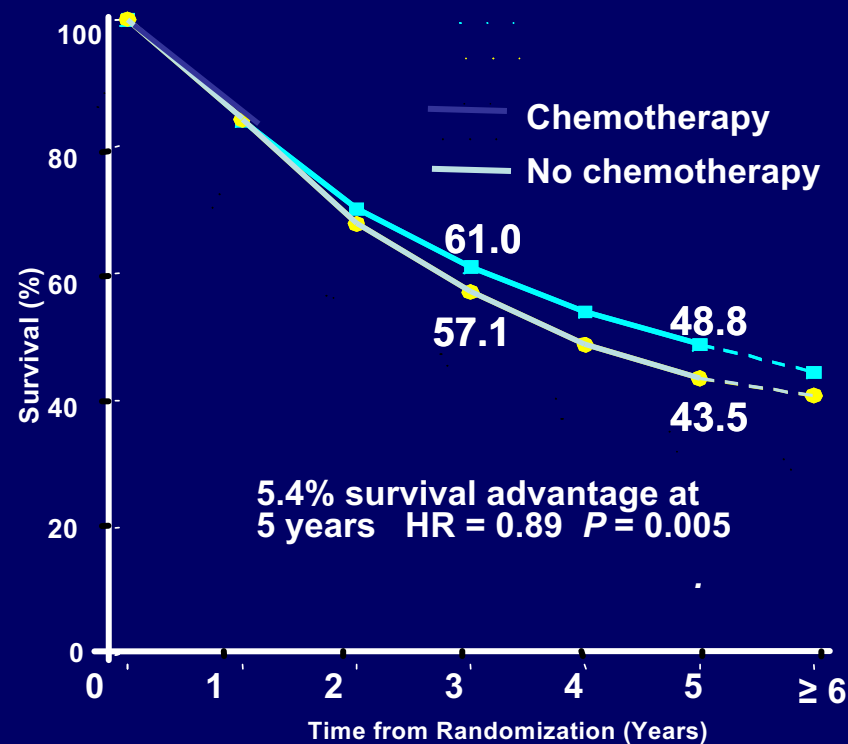
Early Stage and Locally Advanced NSCLC

Paul A. Bunn, Jr, MD, Distinguished Professor and Dudley Endowed Chair,
Univ. of Colorado Cancer Center, Aurora, CO, USA



Meta-analyses of Adjuvant CT and Neoadjuvant CT

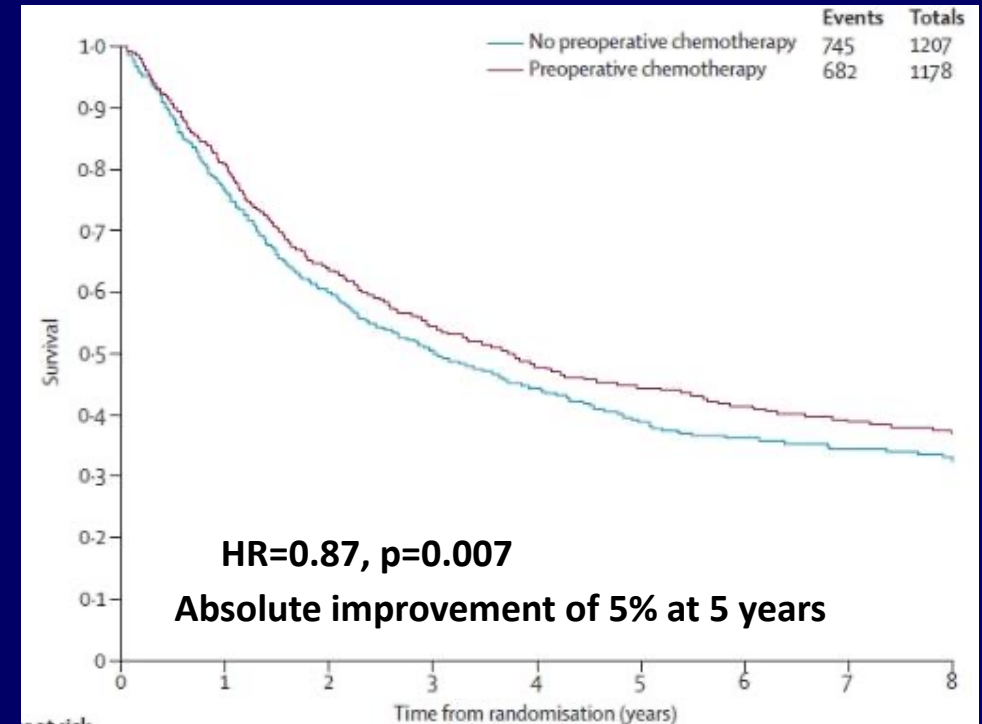
LACE: Pooled Adjuvant Data Overall Survival



Pignon JP, et al. *J Clin Oncol.* 2008;26:3552-3559

Path CR Rates <5%

NSCLC Neoadjuvant Collaborative Group meta-analysis



Lancet 2014;303:1561-71

Efficacy of Preoperative Immunotherapy

Path CR Rates 10-15%

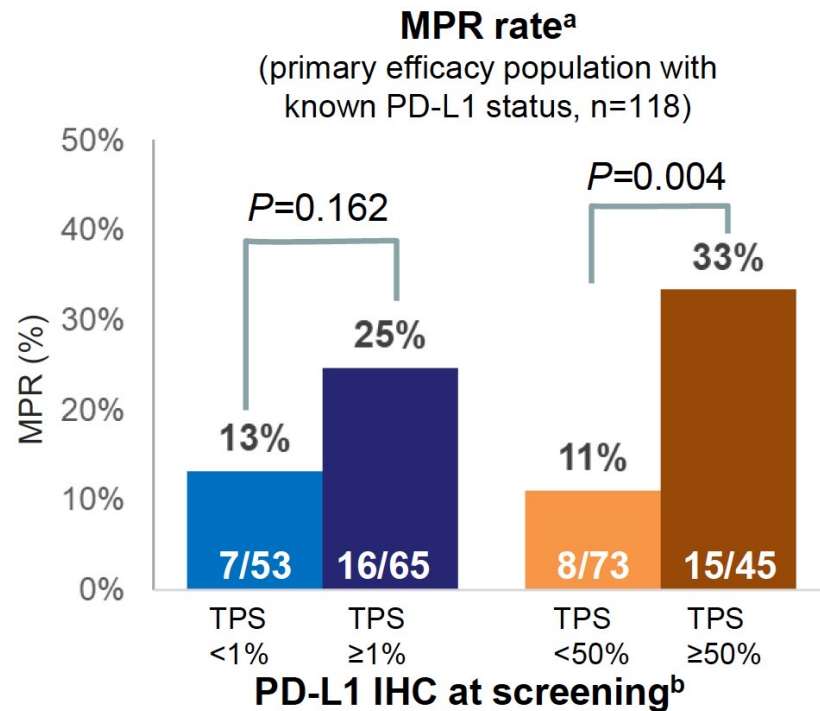
Study	Total n= Squam, %	Stage I/II III	Drug # of preoperative cycles	# taken to surgery(%) #R0	ORR DCR	pCR [^]	MPR [^]	Biomarker Correlation with MPR
PD-(L)1 Monotherapy								
Forde NEJM 2018	21 6 (29%)	66% 33%	Nivo 3 mg/kg x 2	21 (100) 20 R0	10% 95%	10%	45%	PD-L1: No correlation TMB: Correlation (+)
Gao JTO 2021	40 33 (83%)	55% 45%	Sintilimab 200 mg x 2	37 (92.5) 36 R0	20% 90%	16.2%	40.5%	PD-L1: Correlation (+)* TMB: NR
LCMC3	181 69 (38%)	51% 49%	Atezo 1200 mg x 2	159 (88) 145 R0	7%** 95%	7%	21%	PD-L1: No correlation TMB: No correlation
NEOSTAR	23 10 (43%)	78% 22%	Nivo 3 mg/kg x 3	22 (96) 22 R0	22% 87%	10%	19%	PD-L1: Correlation (+) TMB: NR
MK3475-223	15 NR	100% 0%	Pembro 200 mg x 1-2	13 (87) NR	13% NR	15%	31% 40% (2 doses)	PD-L1: No correlation TMB: NR
IFCT-1601 IONESCO	50 21 (42%)	96% 4%	Durva 750 mg x 3	43 (93) 41 R0	9% 87%	7%	18.6%	PD-L1: NR TMB: NR
PRINCEPS	30 NR	70% 30%	Atezo 1200 mg x 1	30 (100) 29 R0	7% 100%	0%	14%	PD-L1: Correlation (+) TMB: NR
Dual Checkpoint Inhibitors								
Reuss JITC 2020	9 1 (11%)	33% 66%	Nivo 3 mg/kg x3, Ipi 1 mg/kg x 1	6 (67%) R0 NR	11% 55%	33%	33% (all pCR)	PD-L1: Correlation (+) TMB: No correlation
NEOSTAR	21 7 (33%)	81% 19%	Nivo 3 mg/mg x 3 Ipi 1 mg/kg x 1	17 (81) 17 R0	19% 81%	38%	44%	PD-L1: Correlation (+) TMB: NR

Squam: squamous; ORR: objective response rate; DCR: disease control rate; pCR: pathologic complete response; MPR: major pathologic response; TMB: tumor mutation burden; nivo: nivolumab; atezo: atezolizumab; pembro: pembrolizumab; durva: durvalumab; ipi: ipilimumab; NR: not reported

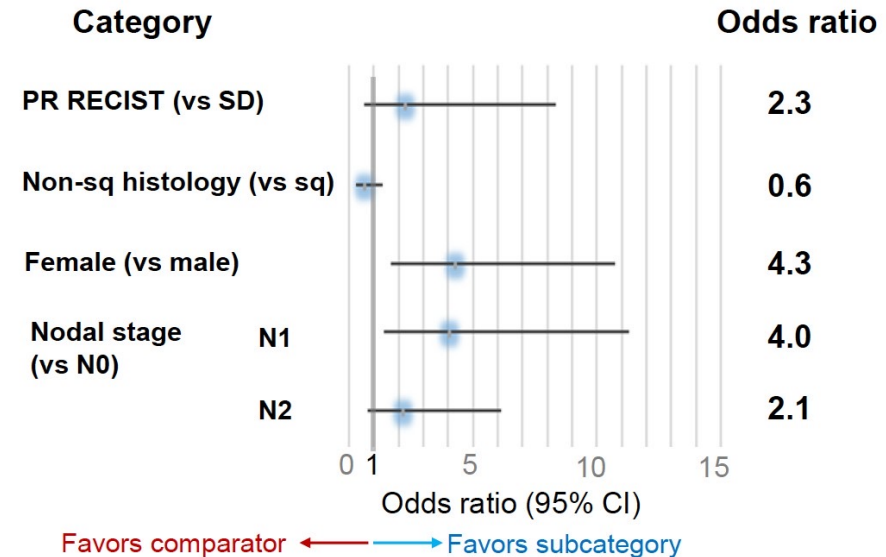
[^]Specimens with pCR also included among those with MPR. The denominator is patients undergoing resection. *Correlation in stromal cells only; **Based on data reported for 82 patients

PD-L1 important with neo-adjuvant atezolizumab – LCMC3

MPR by PD-L1 status at screening and selected patient categories LCMC3



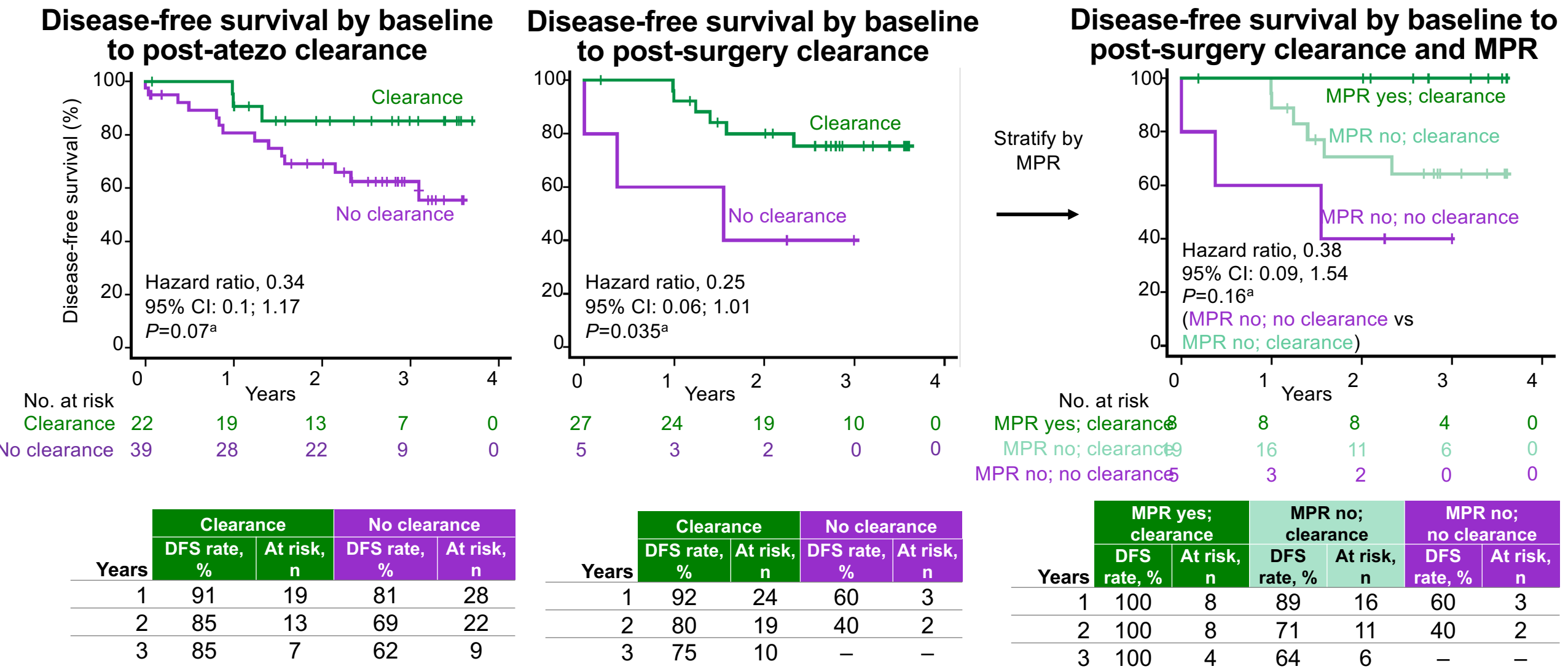
MPR rate for clinical subgroups (n=144)



sq, squamous.

^a Analysis population excluded of EGFR and ALK positive patients. ^b Local TPS score used if central score was not available.

LCMC 3 Atezo Neoadj.: Preliminary results showed improved disease-free survival in patients with ctDNA clearance



Neoadjuvant immuno-chemotherapy clinical trials

Trial	Phase	Enrollment	Stage	Neoadjuvant treatment	MPR	pCR
NCT02716038	II	30	IB-III A*	Atezolizumab + platinum doublet × 4 cycles	57%	33%
NADIM	II	46	III A*	Nivolumab + platinum doublet × 3 cycles	83%	63%
NCT04304248	II	33	III A, T3-4N2 IIIB**	Toripalimab + platinum doublet × 3 cycles	67%	50%
SAKK16/14	II	68	T1-3N2M0, III A(N2)*	Platinum doublet × 3 cycles, followed by durvalumab × 2 cycles	62%	18%
CheckMate816	III	358	IB-III A*	Nivolumab + platinum doublet vs platinum doublet × 3 cycles	36.9% vs 8.9%	24% vs 2.2%

*, per American Joint Committee on Cancer 7th edition
 **, per American Joint Committee on Cancer 8th edition
 pCR, complete pathology response.

Path CR 37-83%

NADIM Phase II (Nivo +CT):PFS & OS

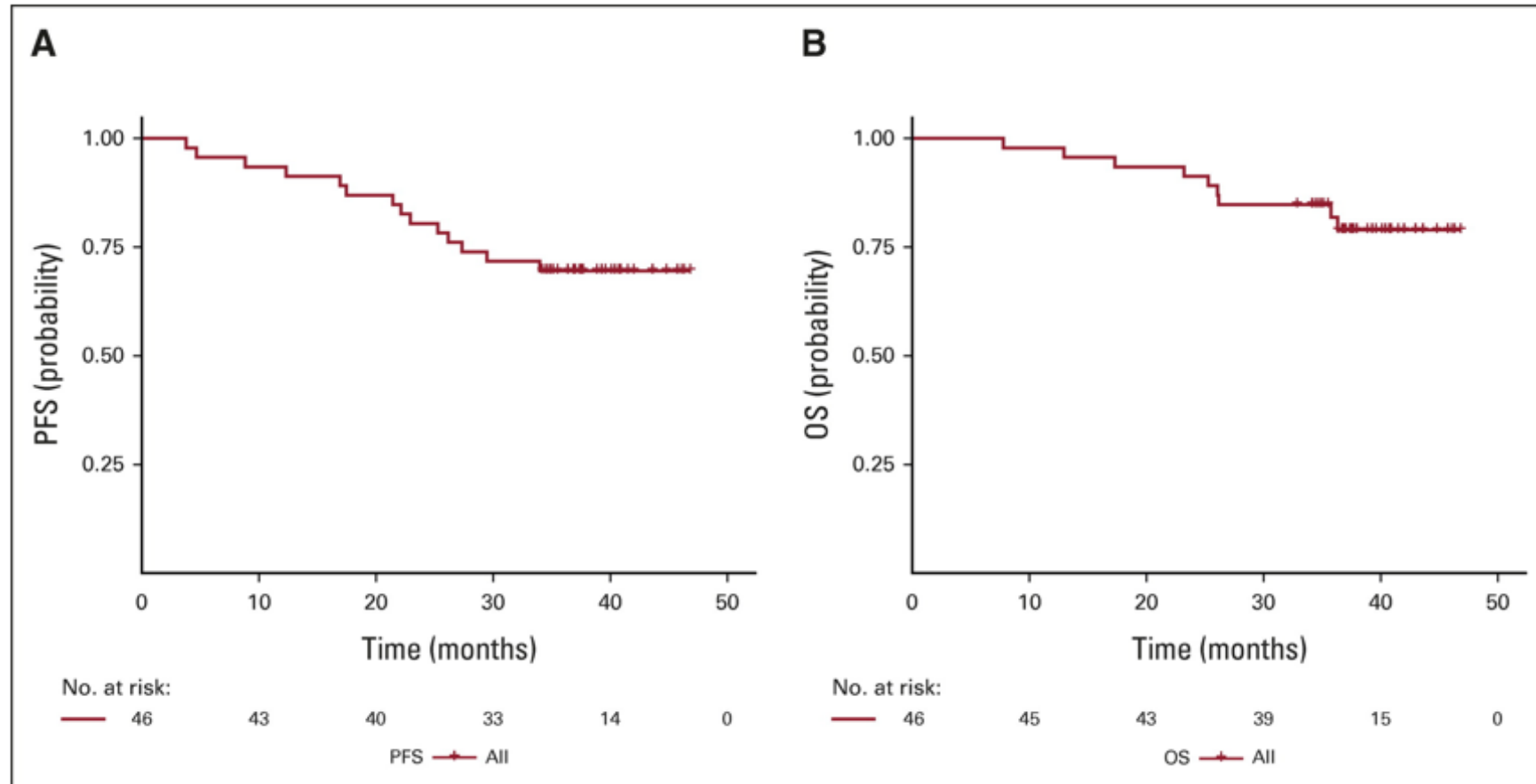
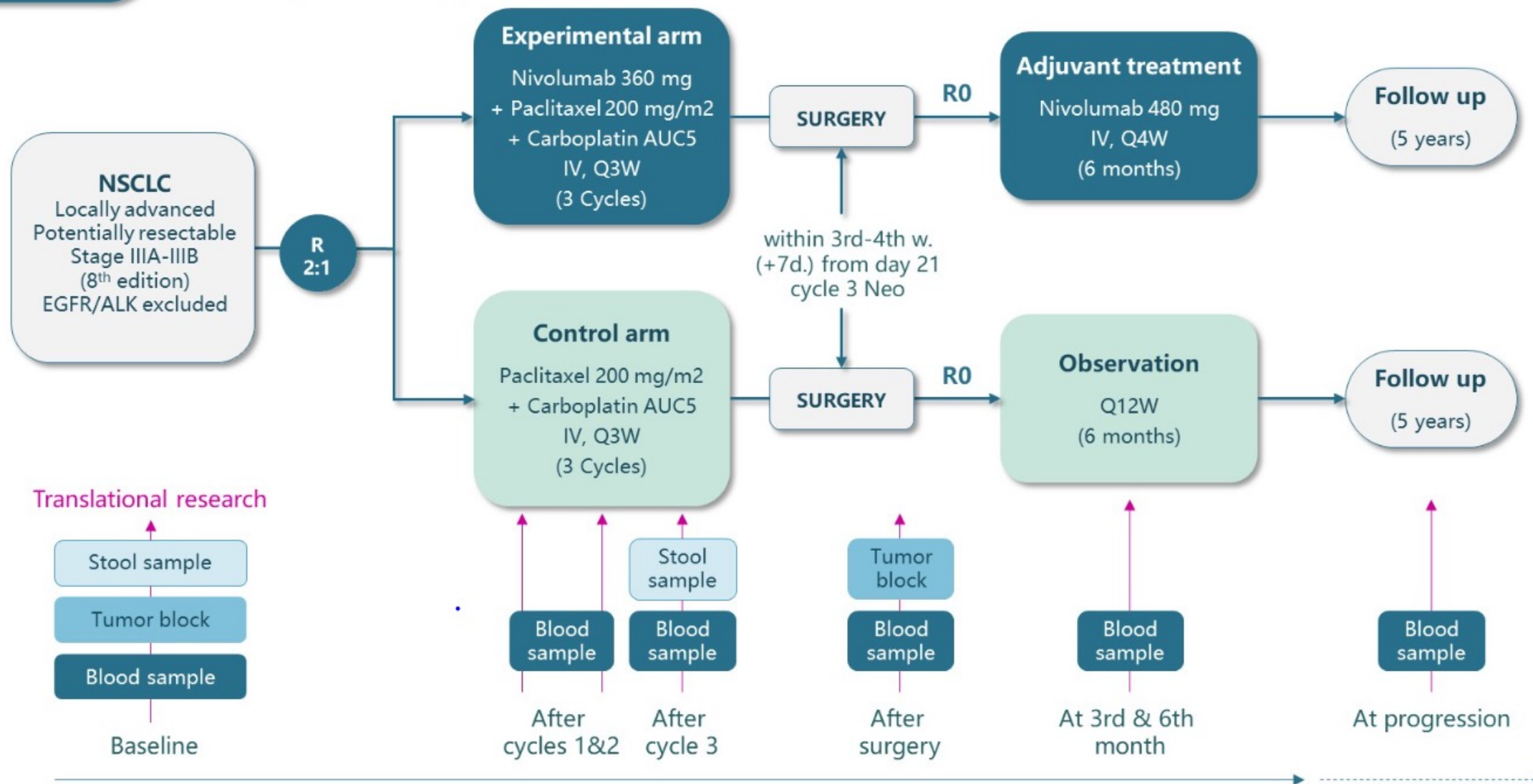


Fig 1. Kaplan-Meier curves for (A) PFS and (B) OS in the ITT population (N = 46). ITT, intention-to-treat; OS, overall survival; PFS, progression-free survival.

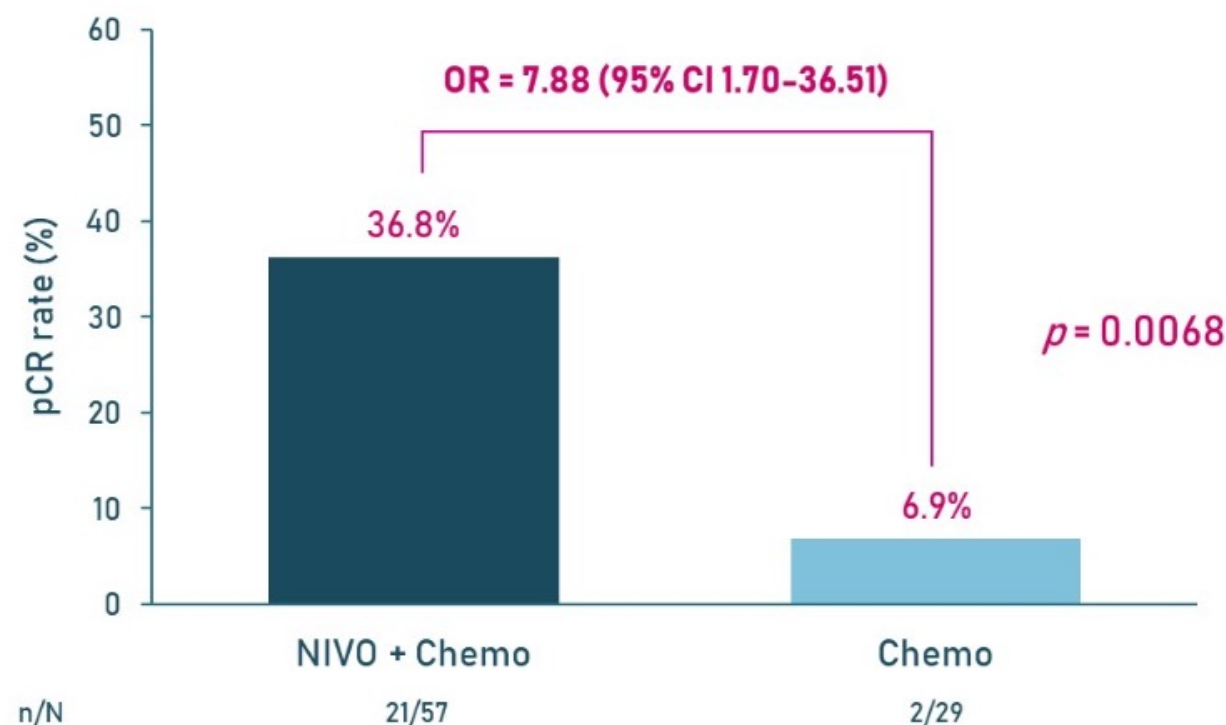
Randomized neoadjuvant trials: CT+ IO vs CT

CANOPY N	NCT 03968419	Canakinumab or pembrolizumab (200 mg) or Canakinumab + Pembrolizumab x 2 cycles → S	IB-III A	110	II	MPR
KEYNOTE 617	NCT 03425643	CT + Pembrolizumab (200 mg) / placebo x 4 cycles → S → Pembrolizumab / Placebo x 13 cycles	IIB-III A	786	III	EFS, OS
CheckMate 816*	NCT 02998528	CT + Nivolumab (360 mg) x 3 cycles → S vs. CT x 3 cycles → S	IB-III A	350	III	EFS, MPR
IMpower 030	NCT 03456063	CT + Atezolizumab` (1200 mg) / placebo x 4 cycles → S → Atezolizumab / Placebo x 16 cycles	II-III B (cT3N2)	374	III	MPR
AEGEAN	NCT 03800134	CT + Durvalumab (1500 mg) / Placebo Q3W x 4 cycles → S → Durvalumab / Placebo Q4W x 12 cycles	IIA-III B	300	III	MPR



NADIM II (NCT03838159) is a randomized, phase 2, open-label, multicentre study evaluating nivolumab + chemotherapy vs chemotherapy as neoadjuvant treatment for potentially resectable NSCLC

pCR^a rate with neoadjuvant NIVO + CT vs CT in the ITT population^b

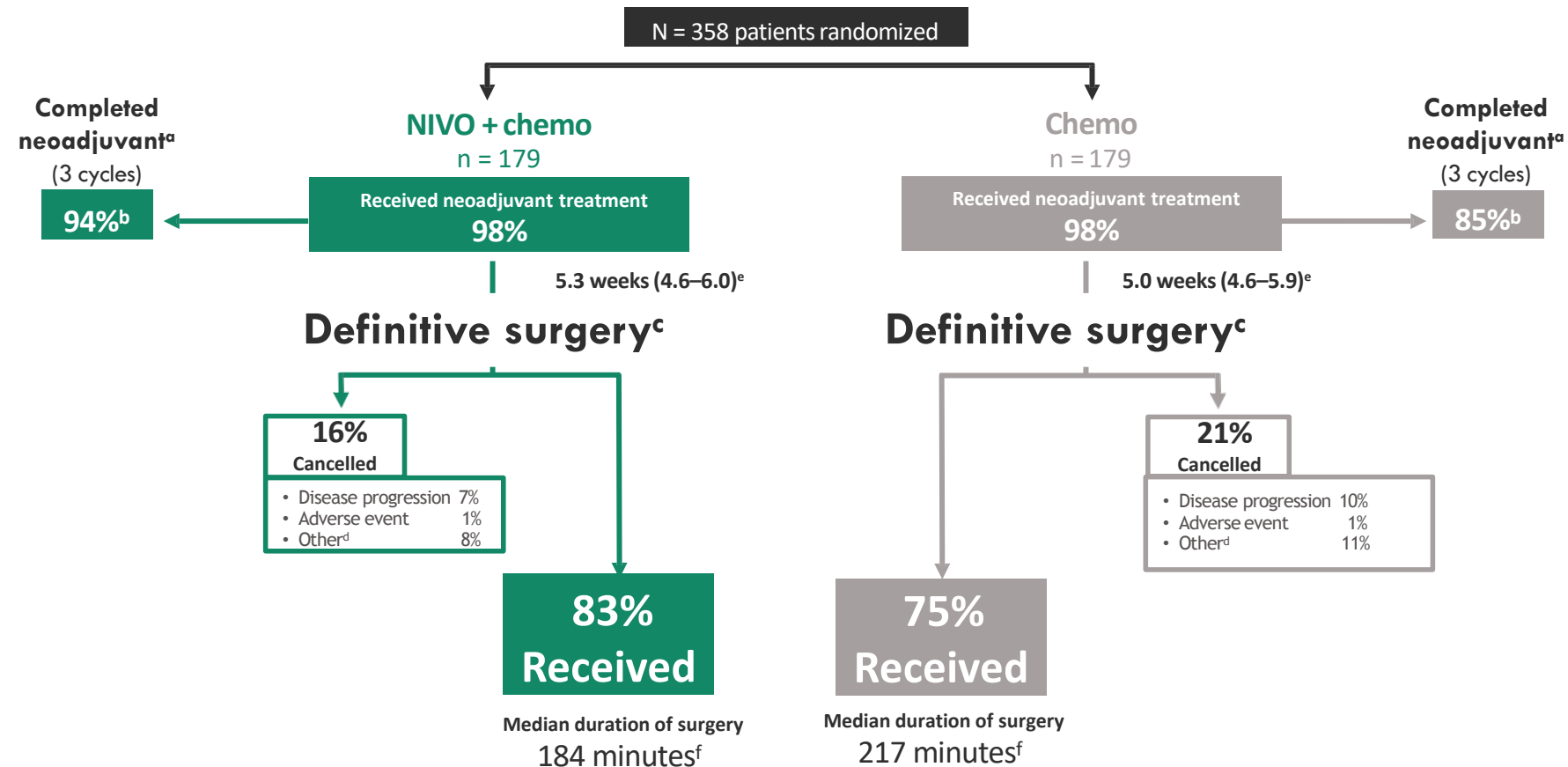


Percentage of patients with a complete response

NNT: 3.34 (2.2–6.95)

^apCR was defined as 0% residual viable tumor cells in both primary tumor (lung) and sampled lymph nodes; ^bPatients who did not undergo surgery were considered as non-responders
Chemo, chemotherapy; ITT, intention-to-treat; Nivo, nivolumab; pCR, pathological complete response; RR, risk ratio

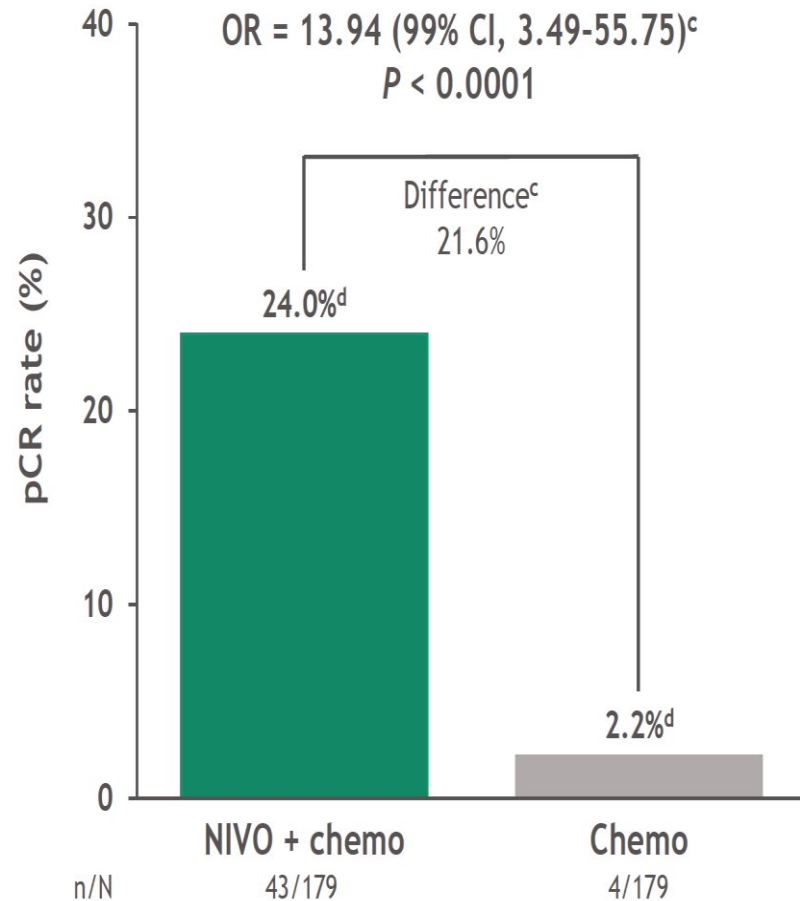
CM816: Treatment and surgery summary: all randomized patients



^aReasons for patients not completing neoadjuvant treatment: study drug toxicity (6% in the NIVO + chemo and 7% in the chemo arm), disease progression (1% in each arm), and other reasons (7% in the chemo arm only; this included AEs unrelated to study drug, patient request to discontinue treatment, patient withdrew consent, and patient no longer meeting study criteria); ^bDenominator based on patients with neoadjuvant treatment; ^cDefinitive surgery not reported: NIVO + chemo, 1%; chemo, 3%; ^dOther reasons included patient refusal, unresectability, and poor lung function; ^eMedian (IQR) time from last dose to definitive surgery; ^fPatients (n) with reported duration of surgery: NIVO + chemo, 122; chemo, 121; IQR for median duration of surgery: NIVO + chemo, 130.0–252.0 minutes; chemo, 150.0–283.0 minutes.

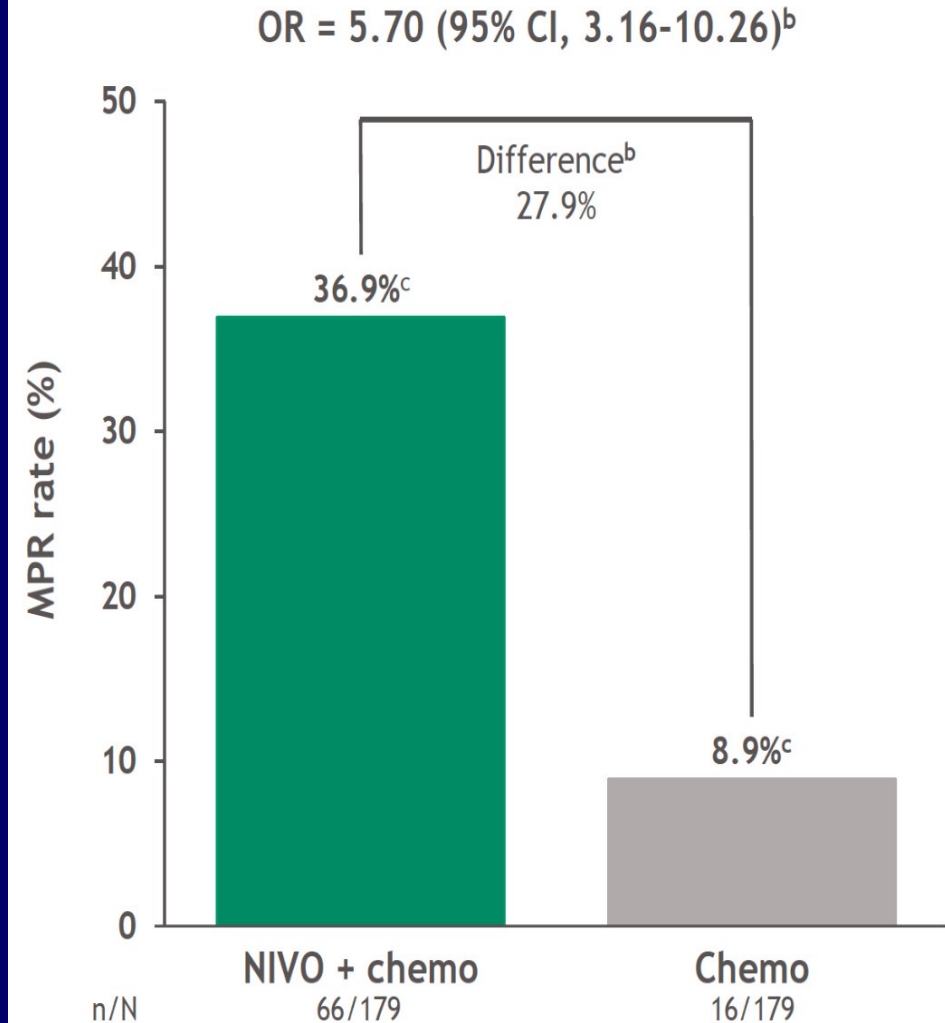
CM816 – pCR and MPR in ITT population

Primary endpoint: ITT (ypT0N0)^b

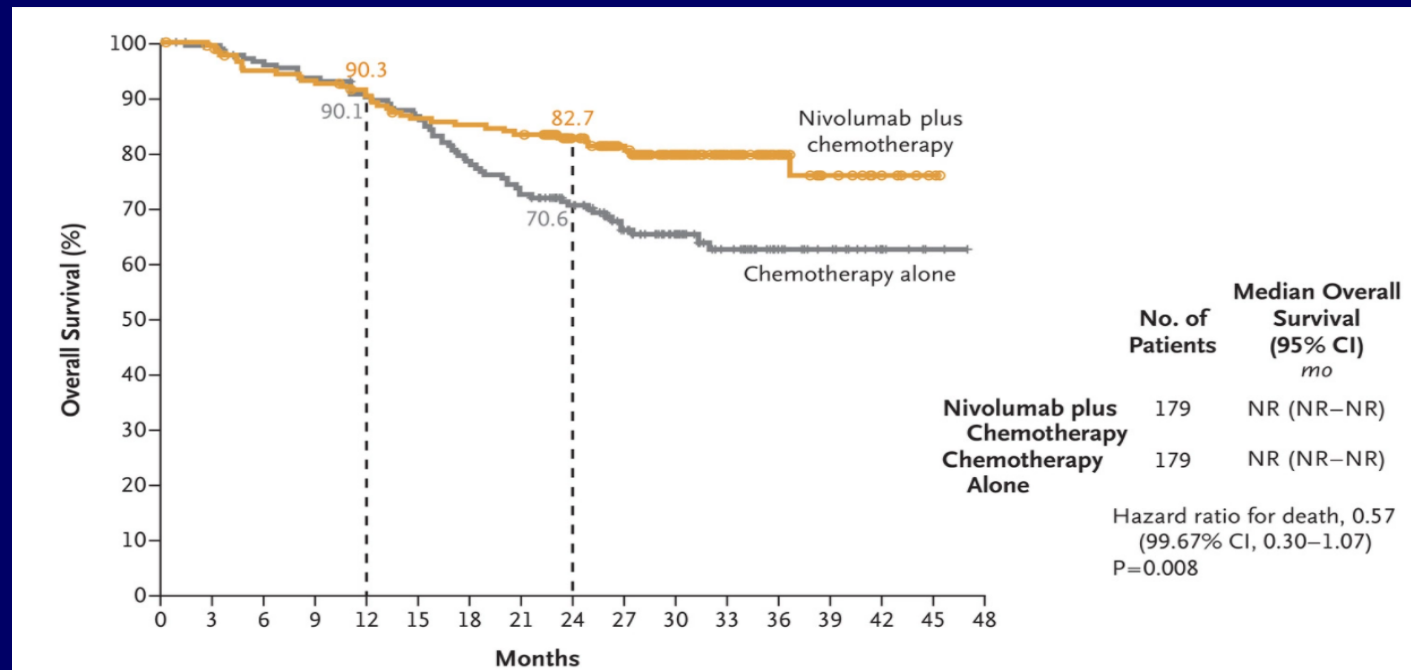
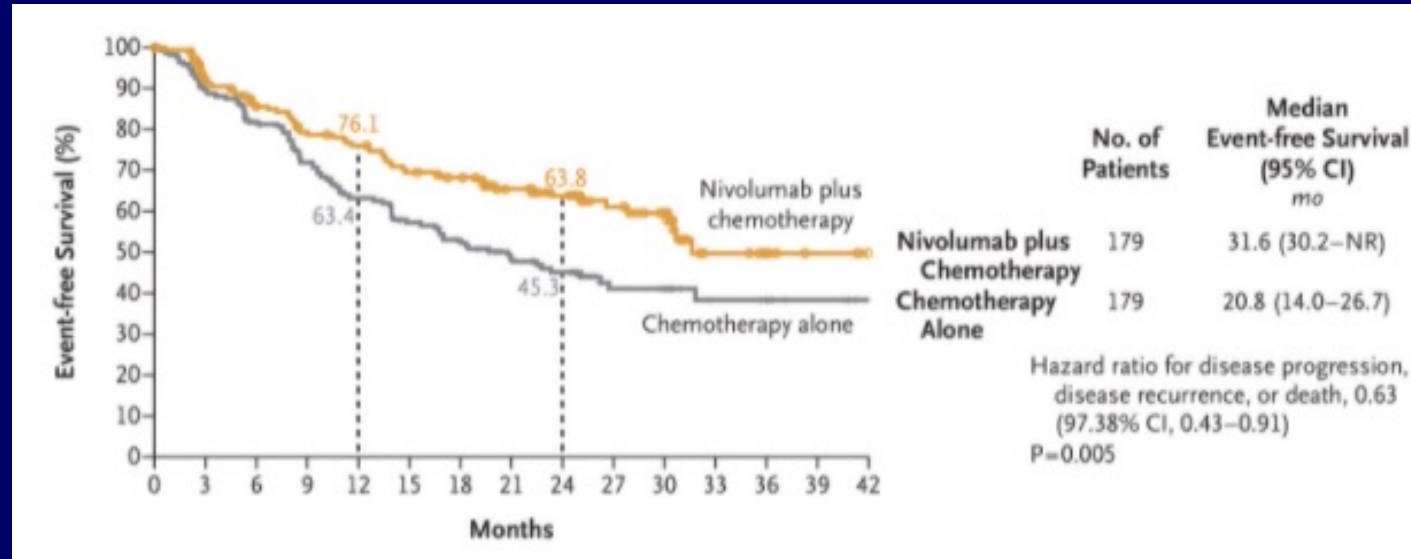


• pCR rate in the exploratory NIVO + IPI arm (ITT) was 20.4% (95% CI, 13.4-29.0)

ITT

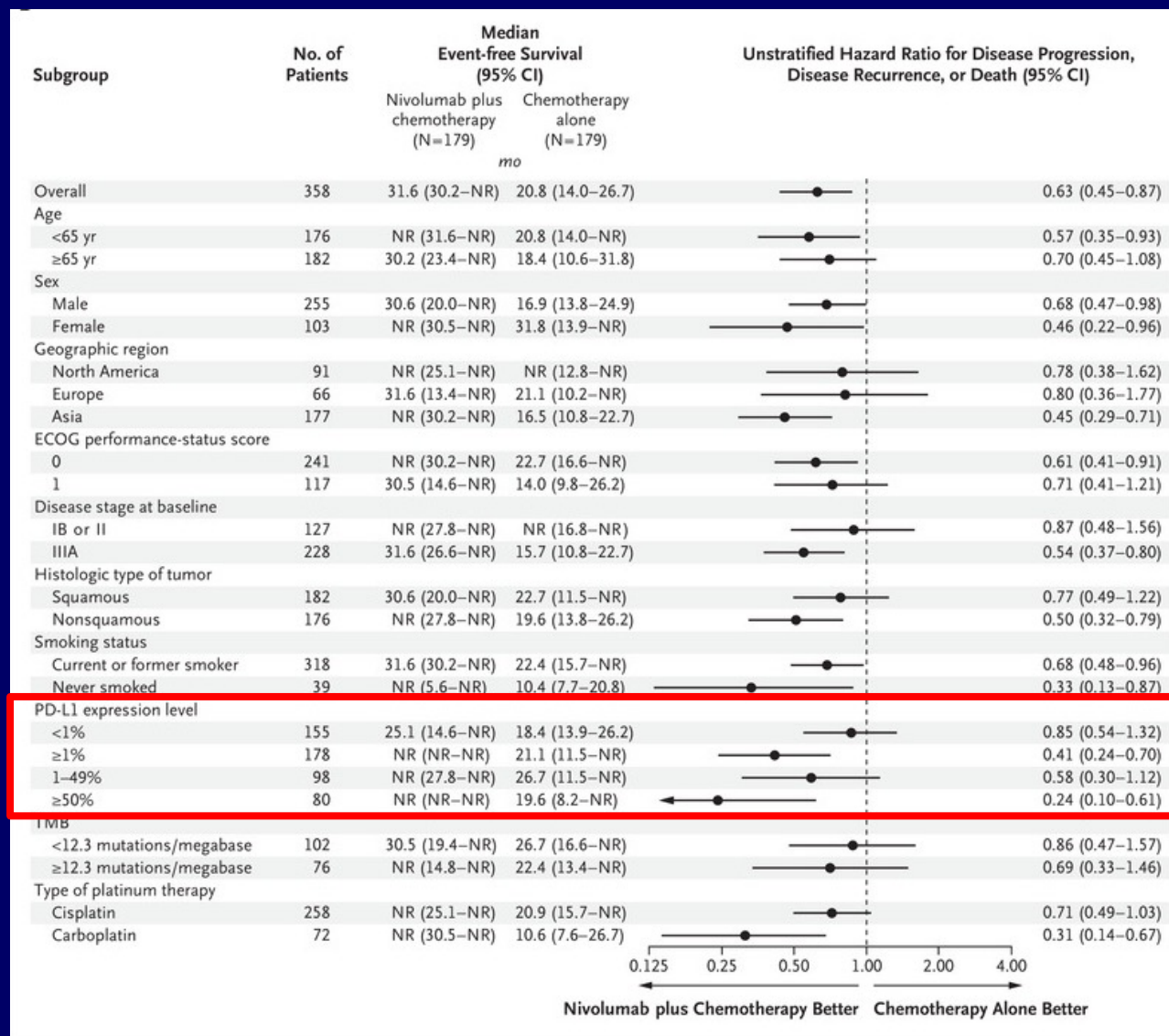


Neoadjuvant Nivo +CT in Early Stage NSCLC



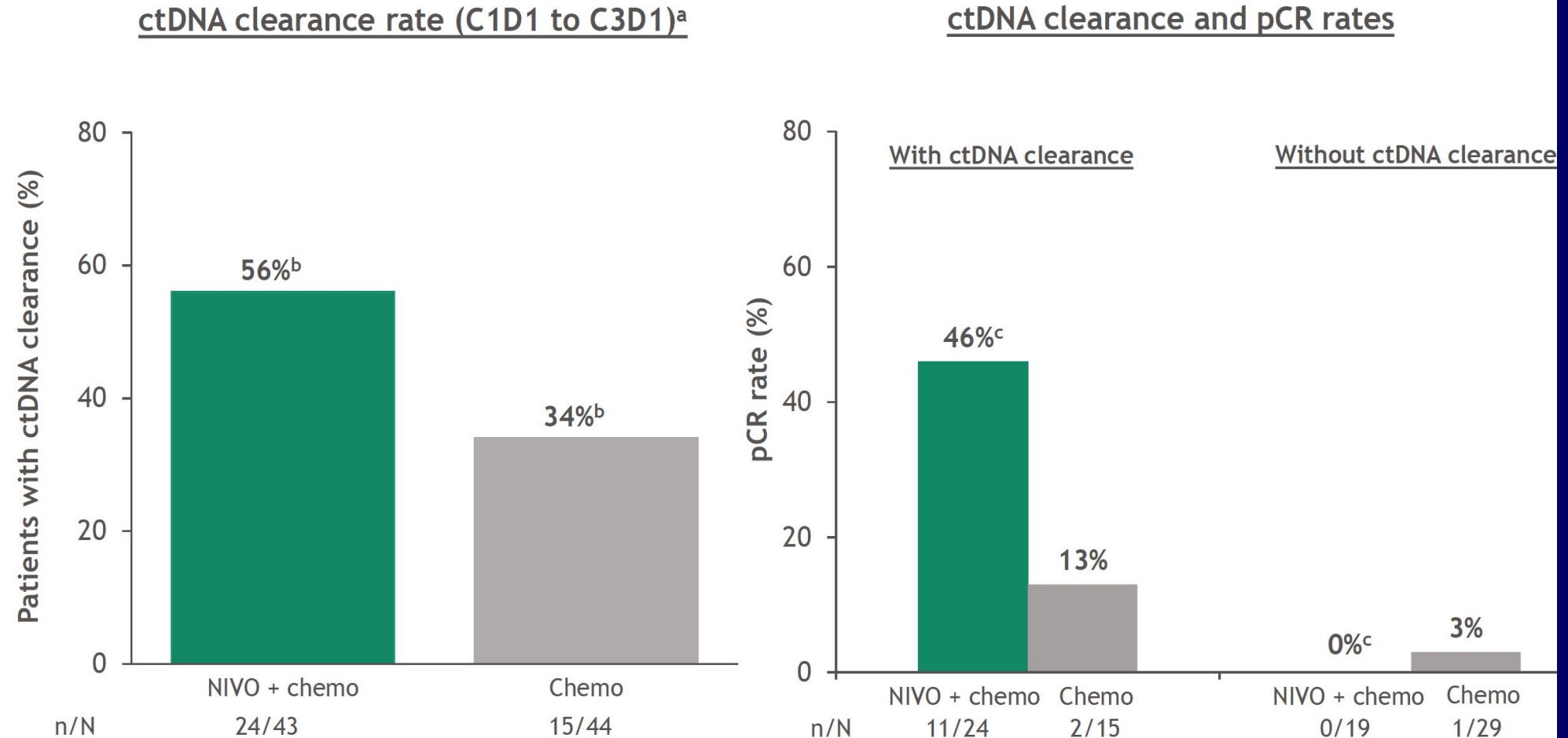
Forde PM et al: Neoadjuvant Nivolumab plus Chemotherapy in resectable lung cancer. NEJM2022

Forest plot of EFS in CM816



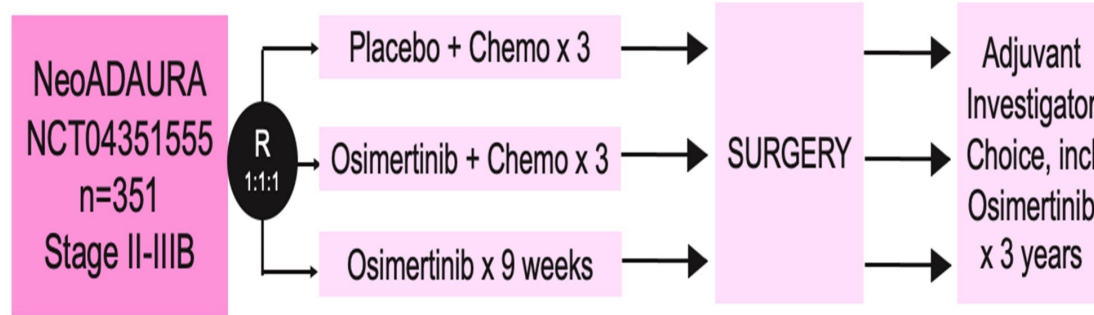
CM816 ctDNA data

ctDNA clearance and association with pathological response



^aPerformed using tumor-guided personalized ctDNA panel (ArcherDX Personalized Cancer Monitoring); 90 patients were ctDNA evaluable and 87 had detectable ctDNA at C1D1; main reason for sample attrition were lack of tissue for WES and lack of quality control pass for tissue and plasma; ^bctDNA clearance 95% CI: NIVO + chemo, 40-71; chemo, 20-50; ^cpCR rates 95% CI for NIVO + chemo: with ctDNA clearance, 26-67; without ctDNA clearance, 0-18.

Ongoing Studies Exploring Neoadjuvant Targeted Therapy



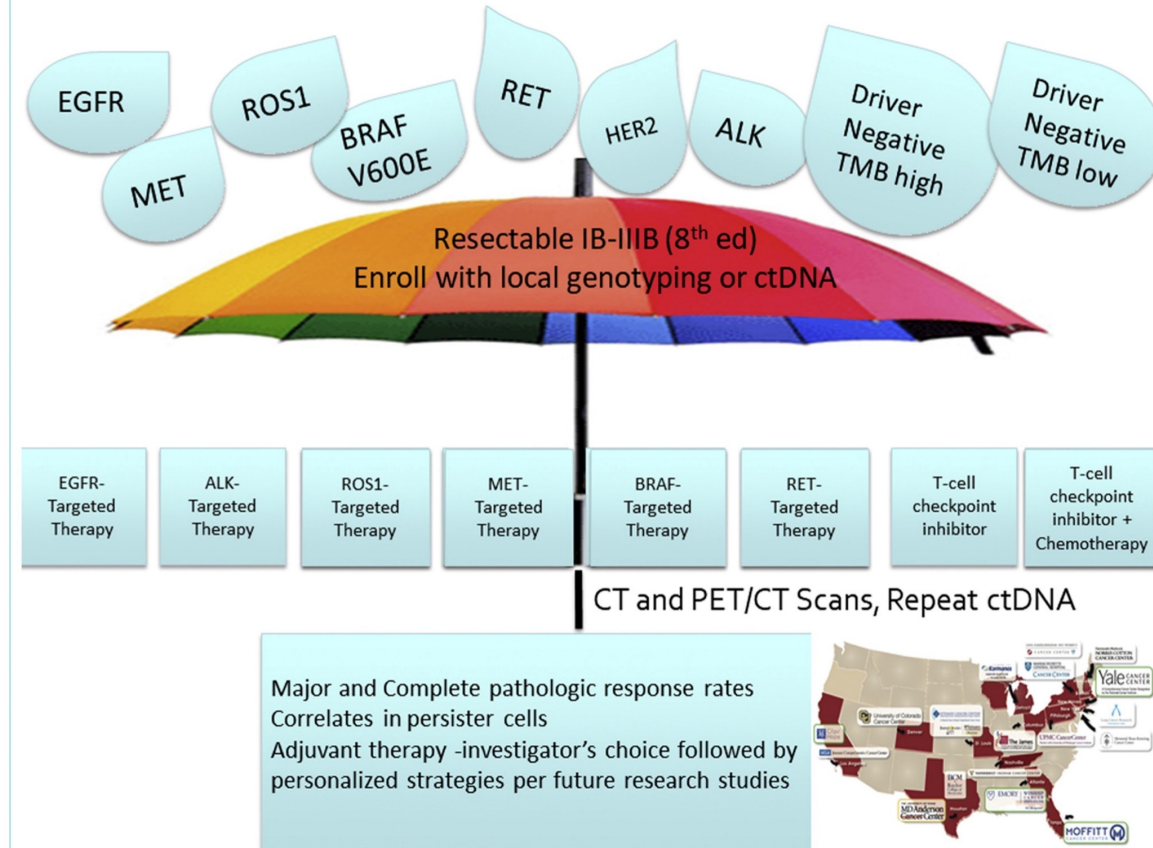
The primary endpoint is pCR

Tsuboi JTO 2021, Blumenthal JTO 2018

Presented By: **Ibiayi Dagogo-Jack MD**

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LCRF LEADER/LCMC4 Study

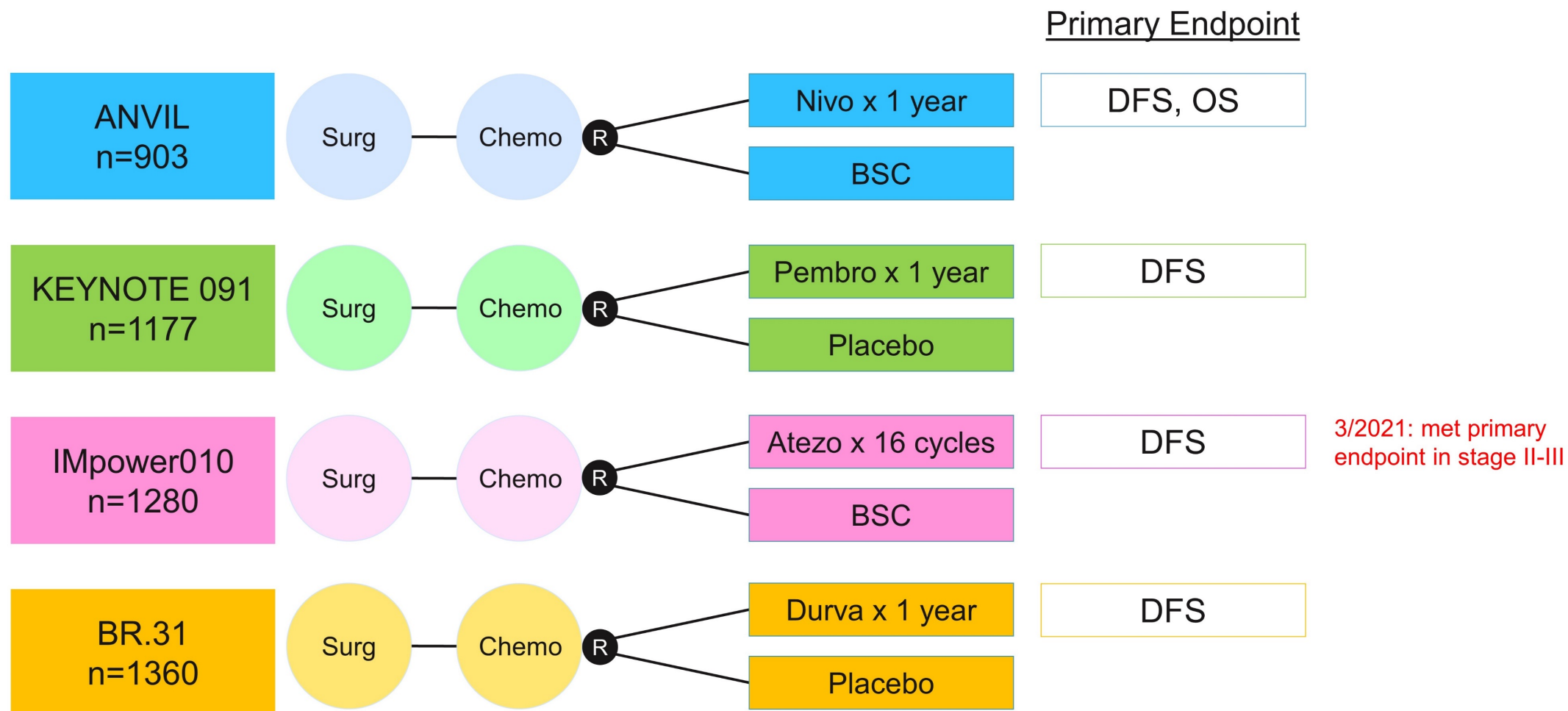


2021 ASCO
ANNUAL MEETING

Major Remaining Questions: Neoadjuvant IO+CT & TKI Rx

- How many pre-op cycles? 2 vs 3
- Need for post-op adjuvant IO?
 - Does pCR matter?
 - Does ctDNA matter?
- Stage 1B included?
- Does PD-L1 status matter?
- Should patients with genetic alterations receive neoadjuvant TKI or CT/IO?

Phase III Studies Exploring Adjuvant Checkpoint Inhibitors

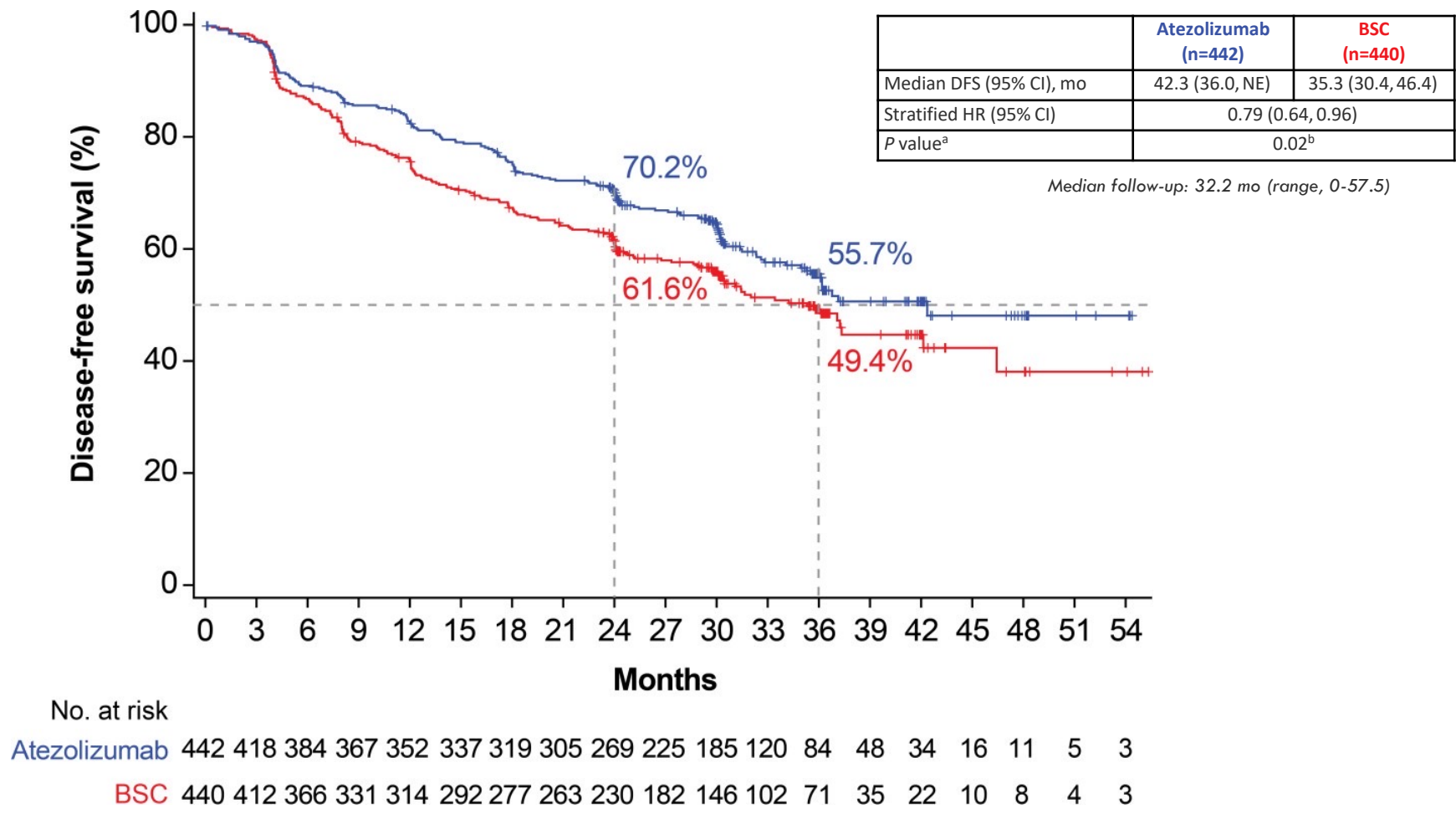


Presented By: **Ibiayi Dagogo-Jack MD**

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2021 ASCO
ANNUAL MEETING

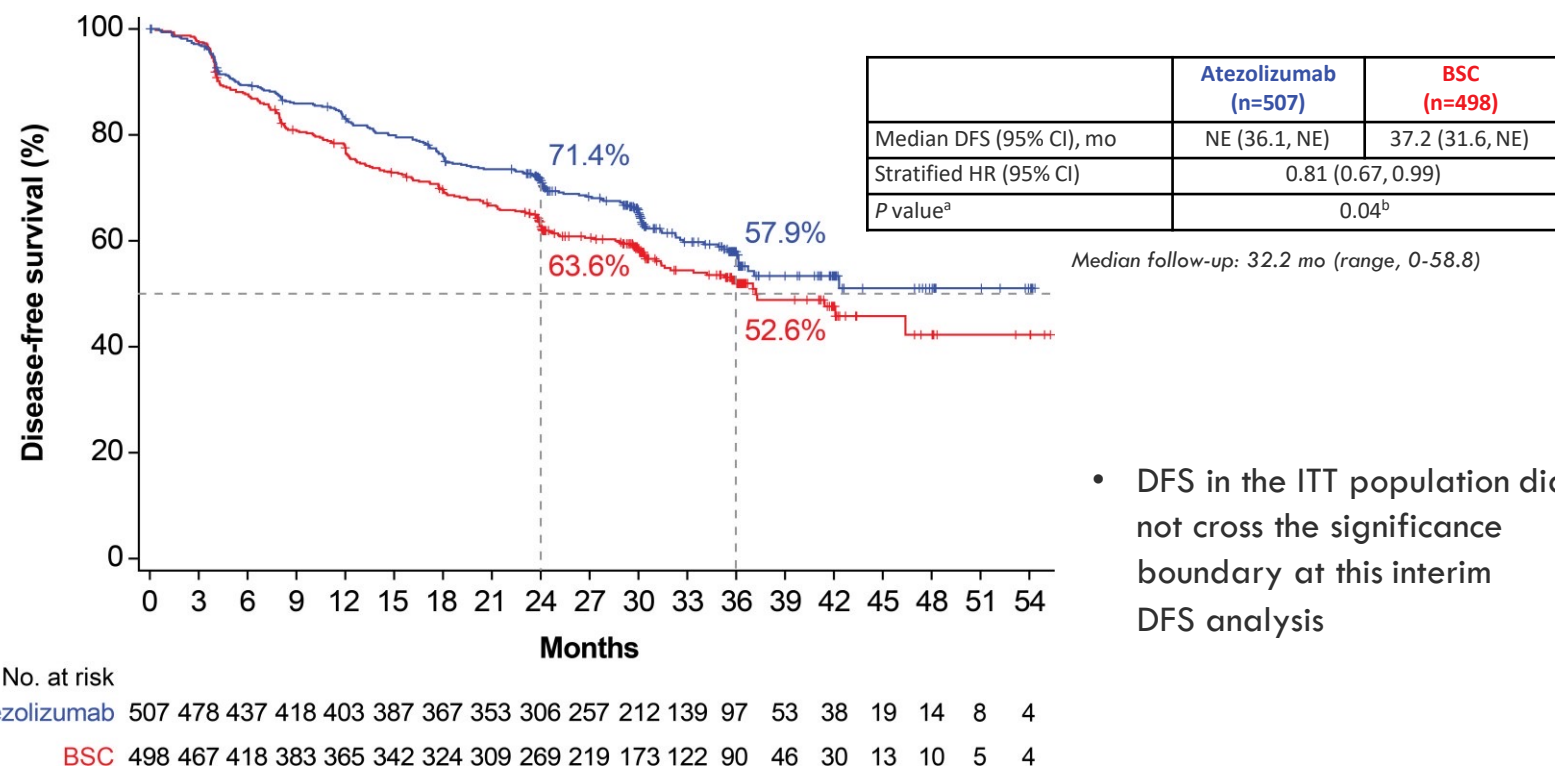
IMpower010: DFS in the all-randomized stage II-IIIa population (primary endpoint)



Dr. Heather A. Wakelee ASCO 2021, abstr 8500 IMpower010 Interim Analysis <https://bit.ly/33t6JJP>

Clinical cutoff: January 21, 2021. ^a Stratified log-rank. ^b Crossed the significance boundary for DFS.

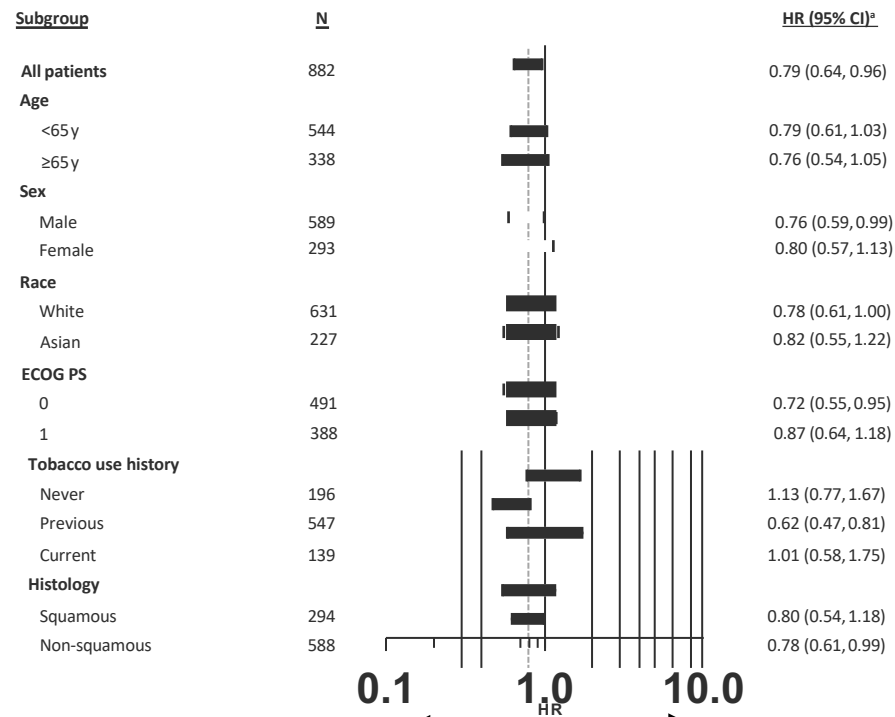
Impower 010: DFS in the ITT population- Exploratory (stage IB-III A; primary endpoint)



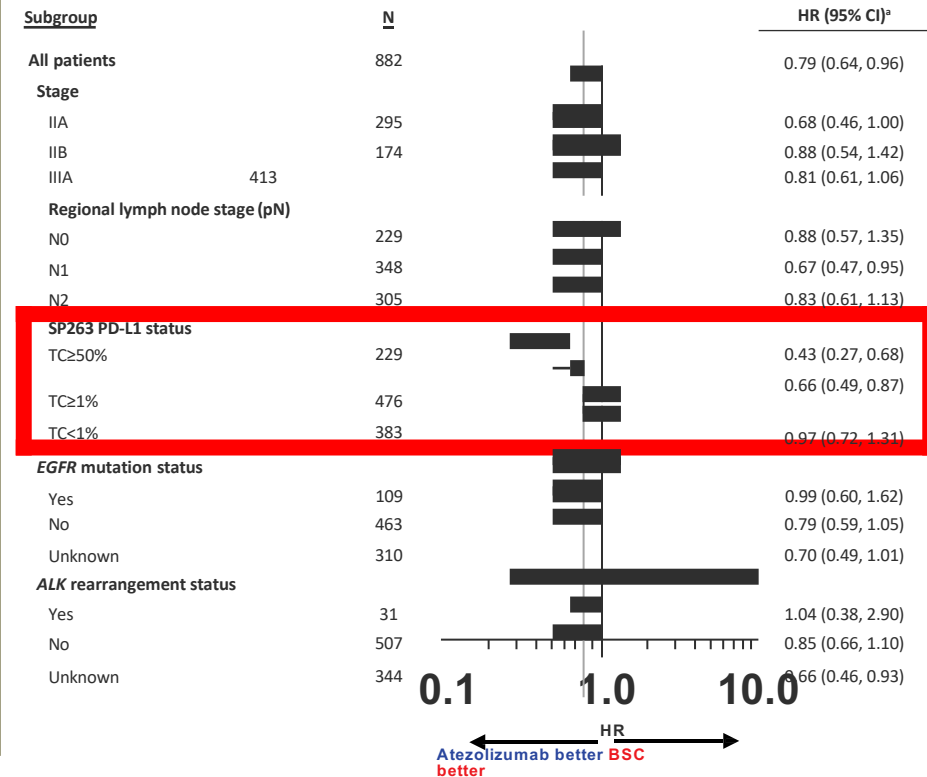
- DFS in the ITT population did not cross the significance boundary at this interim DFS analysis

Clinical cutoff: January 21, 2021. ^a Stratified log-rank. ^b The statistical significance boundary for DFS was not crossed.

Impower 010: DFS in key subgroups of the all-randomized stage II-IIIA population



Clinical cutoff: January 21, 2021. ^a Stratified for all patients; unstratified for all other subgroups.

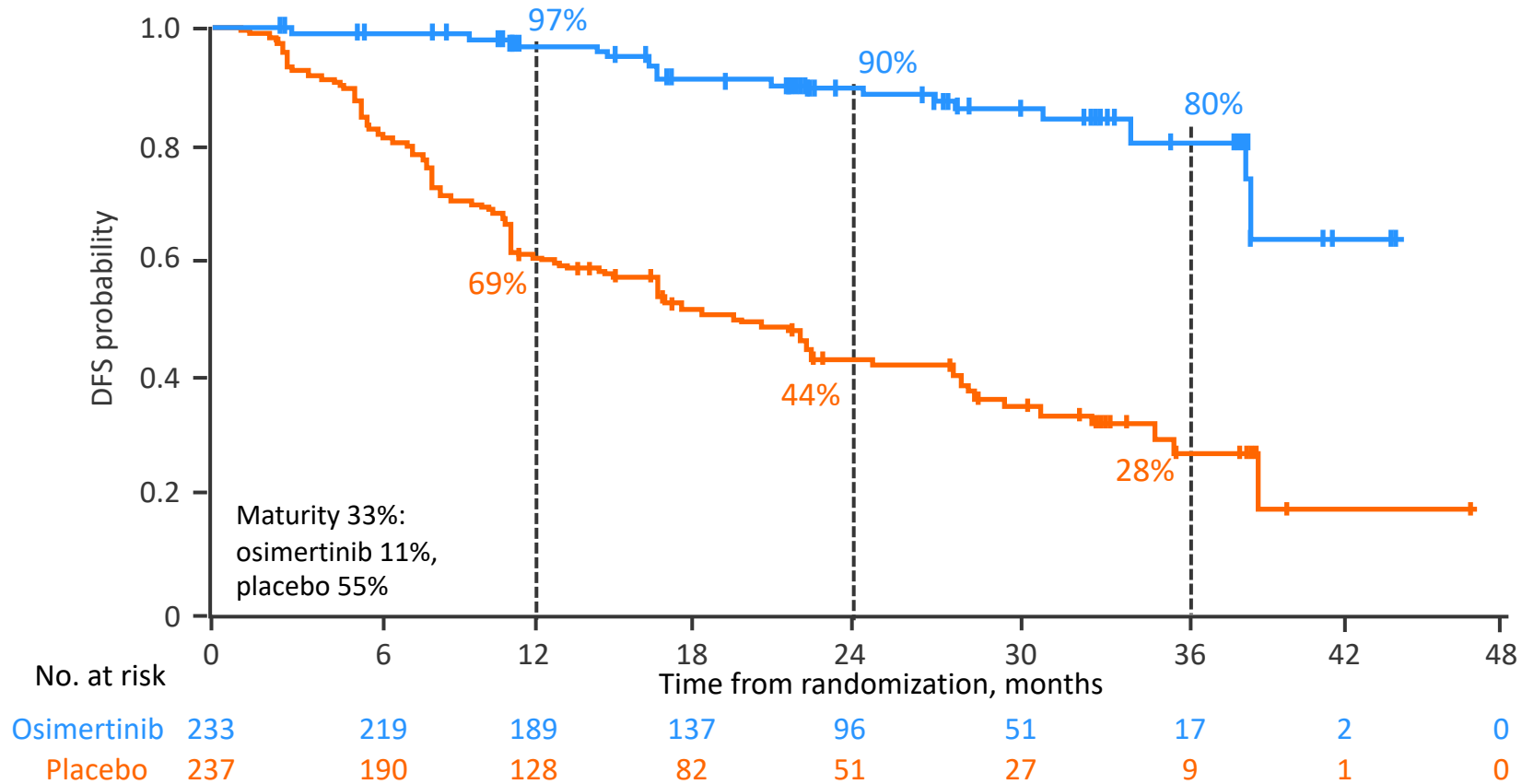


Dr. Heather A. Wakelee ASCO 2021, abstr 8500

IMpower010 Interim Analysis

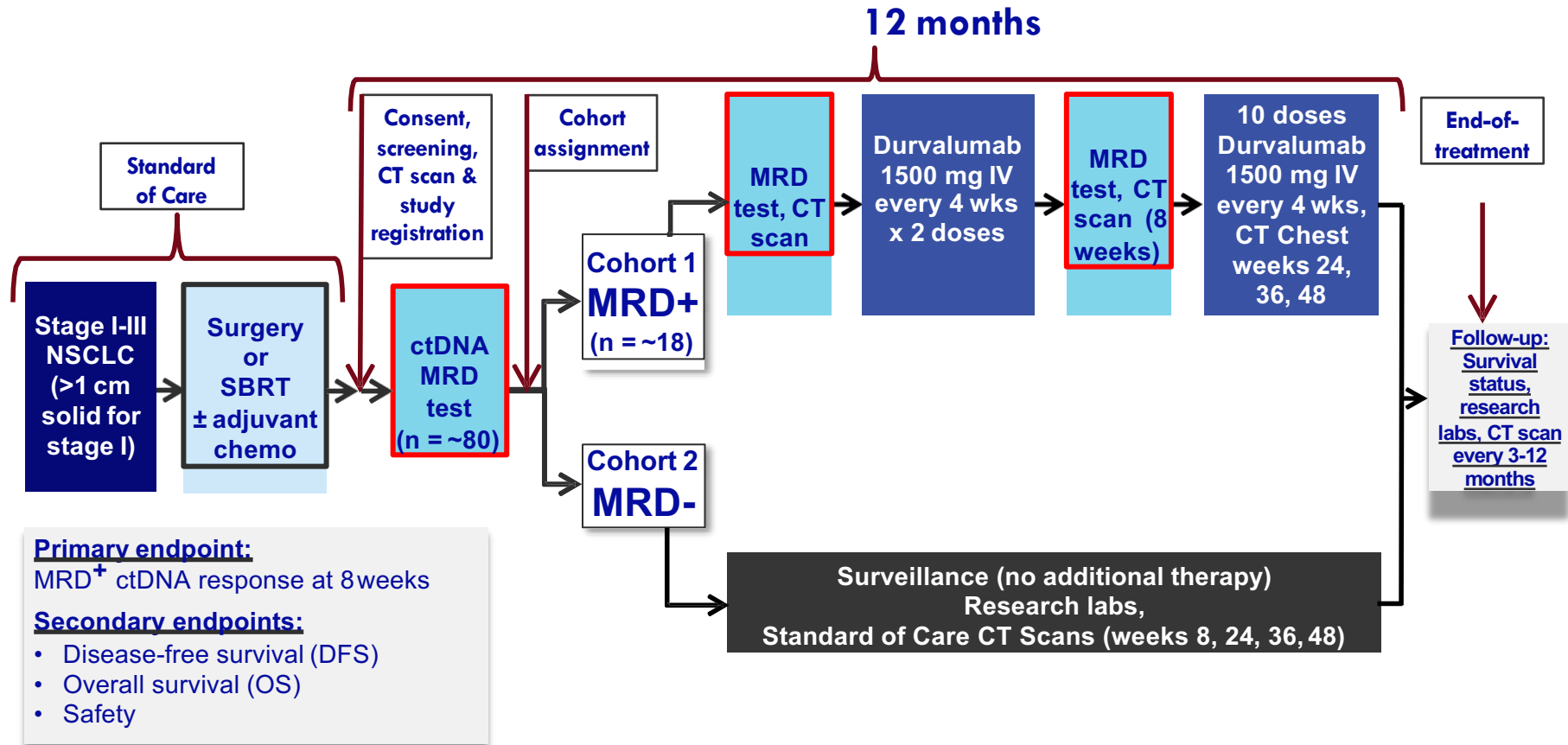
<https://bit.ly/33t6JJp>

ADURA OS Results



Median DFS, months (95% CI)	
– Osimertinib	NR (38.8, NC)
– Placebo	20.4 (16.6, 24.5)
HR (95% CI)	0.17 (0.12, 0.23); p<0.0001
Maturity 33%: osimertinib 11%, placebo 55%	

Adjuvant Durvalumab for Early Stage NSCLC with ctDNA MRD after surgery – ongoing trial



Major Remaining Questions: Adjuvant IO+CT & TKI Rx

- Should patients with ctDNA neg receive any adjuvant IO?
- Optimal duration of IO?
- What about PD-L1 negative?
- What about stage IB?
- What to do for those with other molecular alterations?

PACIFIC: Phase III, Randomized, Double-blind, Placebo-controlled, Multicenter, International Study in unresectable stage III NSCLC

- Patients with stage III, locally advanced, unresectable NSCLC who have not progressed following definitive platinum-based cCRT (≥2 cycles)
- 18 years or older
- WHO PS score 0 or 1
- Estimated life expectancy of ≥12 weeks
- Archived tissue was collected

All-comers population

1–42 days
post-cCRT

R

Durvalumab
10 mg/kg q2w for
up to 12 months
N=476

2:1 randomization,
stratified by age, sex,
and smoking history
N=713

Placebo
10 mg/kg q2w for
up to 12 months
N=237

Co-primary endpoints

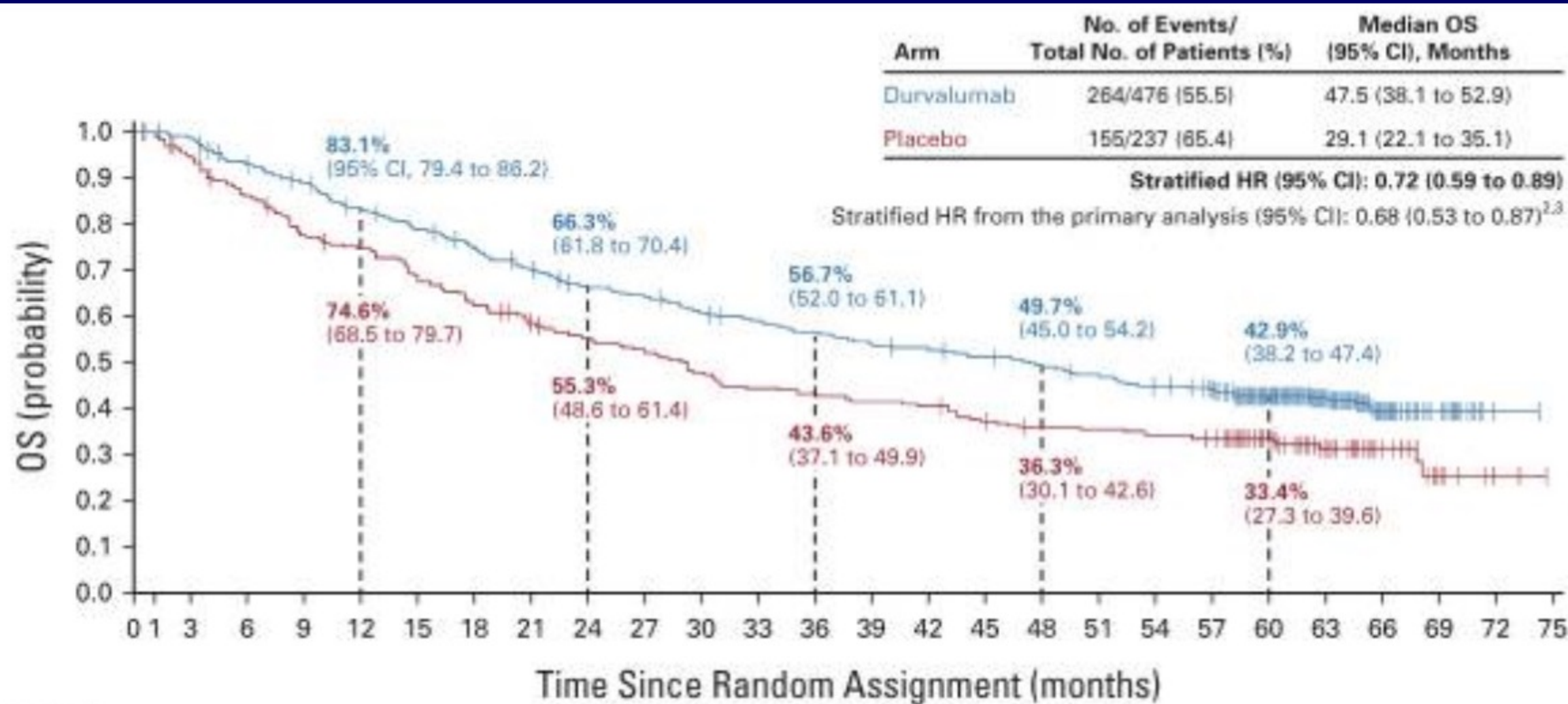
- PFS by BICR using RECIST v1.1*
- OS

Key secondary endpoints

- ORR (per BICR)
- DoR (per BICR)
- Safety and tolerability
- PROs

*Defined as the time from randomization (which occurred up to 6 weeks post-cCRT) to the first documented event of tumor progression or death in the absence of progression.
ClinicalTrials.gov number: NCT02125461 BICR, blinded independent central review; cCRT, concurrent chemoradiation therapy; DoR, duration of response; NSCLC, non-small cell lung cancer; ORR, objective response rate; OS, overall survival; PFS, progression-free survival; PROs, patient-reported outcomes; PS, performance status; q2w, every 2 weeks; RECIST, Response Evaluation Criteria in Solid Tumors; WHO, World Health Organization

PACIFIC: OS (ITT)

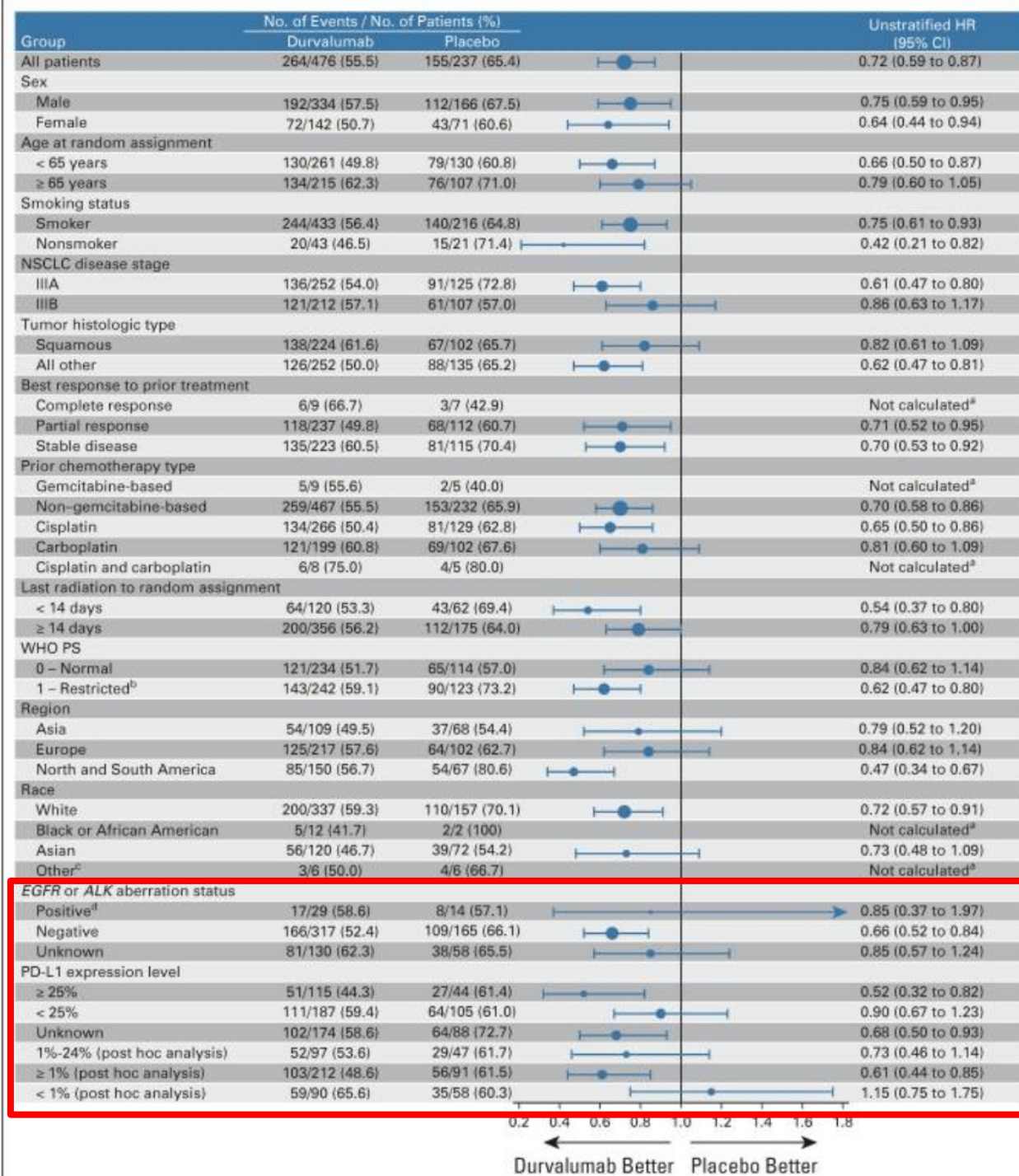


PACIFIC: updated safety summary

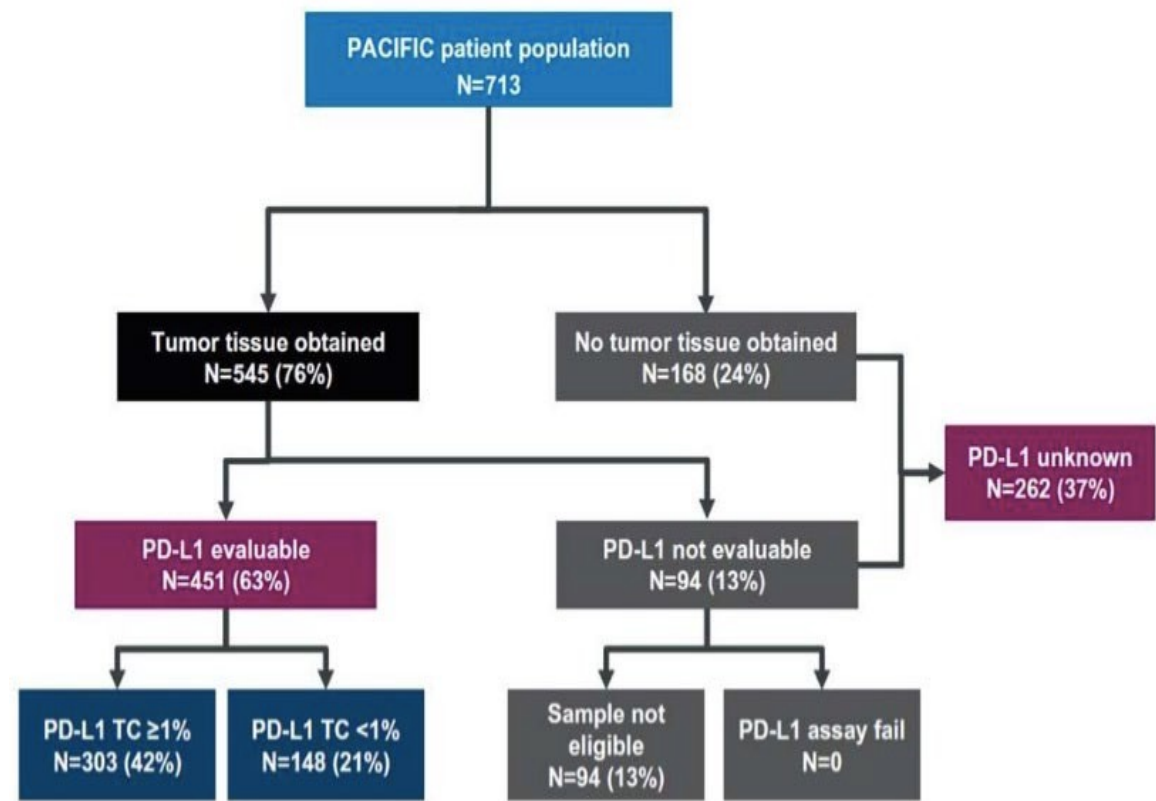
	Durvalumab (N=475)	Placebo (N=234)
Any-grade all-causality AEs, n (%)	460 (96.8)	222 (94.9)
Grade 3/4	145 (30.5)	61 (26.1)
Outcome of death	21 (4.4)	15 (6.4)
Leading to discontinuation	73 (15.4)	23 (9.8)
Serious AEs, n (%)	138 (29.1)	54 (23.1)
Any-grade pneumonitis/radiation pneumonitis, n (%)	161 (33.9)	58 (24.8)
Grade 3/4	17 (3.6)	7 (3.0)
Outcome of death	5 (1.1)	5 (2.1)
Leading to discontinuation	30 (6.3)	10 (4.3)

Forest Plot of OS results From Pacific Trial

Spigel DR et al
JCO 40:1271-1274,2022

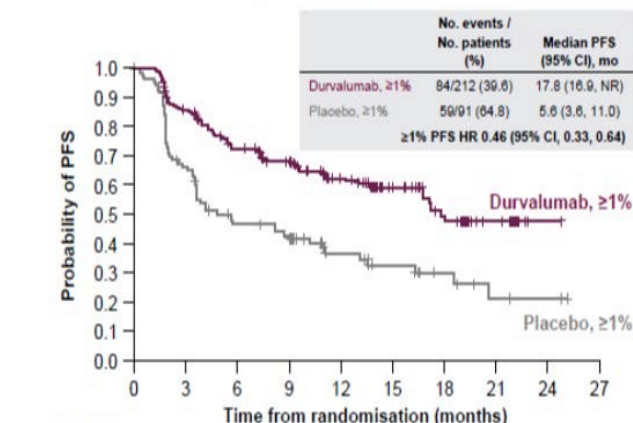


Subgroup analysis by PD-L1 status



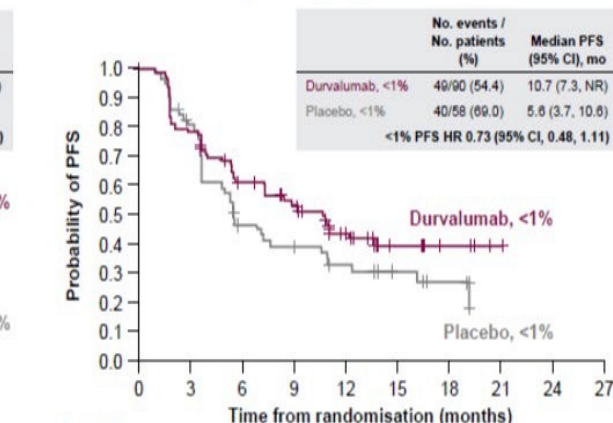
- PD-L1 testing was not required
- 37% of patients with unknown PD-L1 status
- PD-L1 expression-level cutoff of 1% was part of an unplanned post-hoc analysis requested by a health authority

PFS (BICR) by PD-L1 TC ≥1%

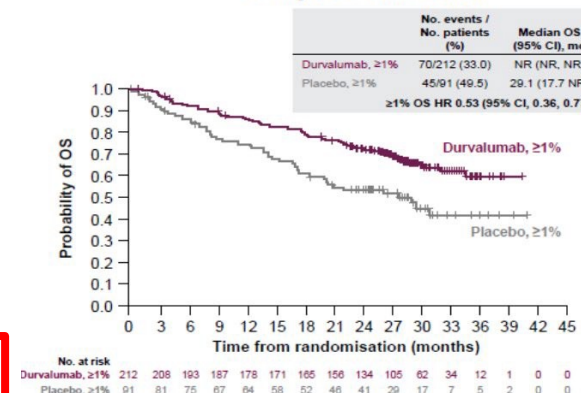


mo, months; NR, not reached; TC, tumour cell

PFS (BICR) by PD-L1 TC <1%

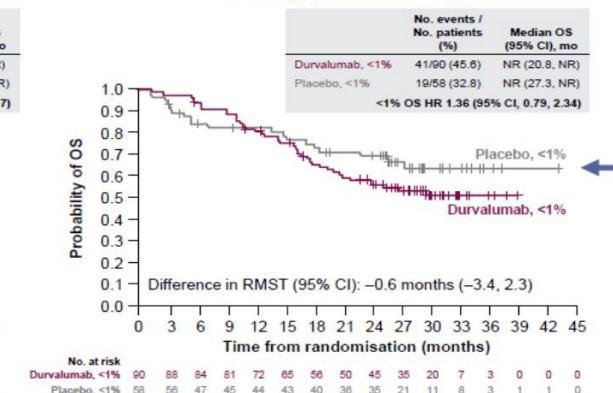


OS by PD-L1 TC ≥1%



RMST, restricted mean survival time

OS by PD-L1 TC <1%



- In the PD-L1 TC <1% subgroup, the number of events are low and overall the subgroup is small
- Imbalances in baseline characteristics

PFS DCO: 13 February 2017; OS DCO: 22 March 2018

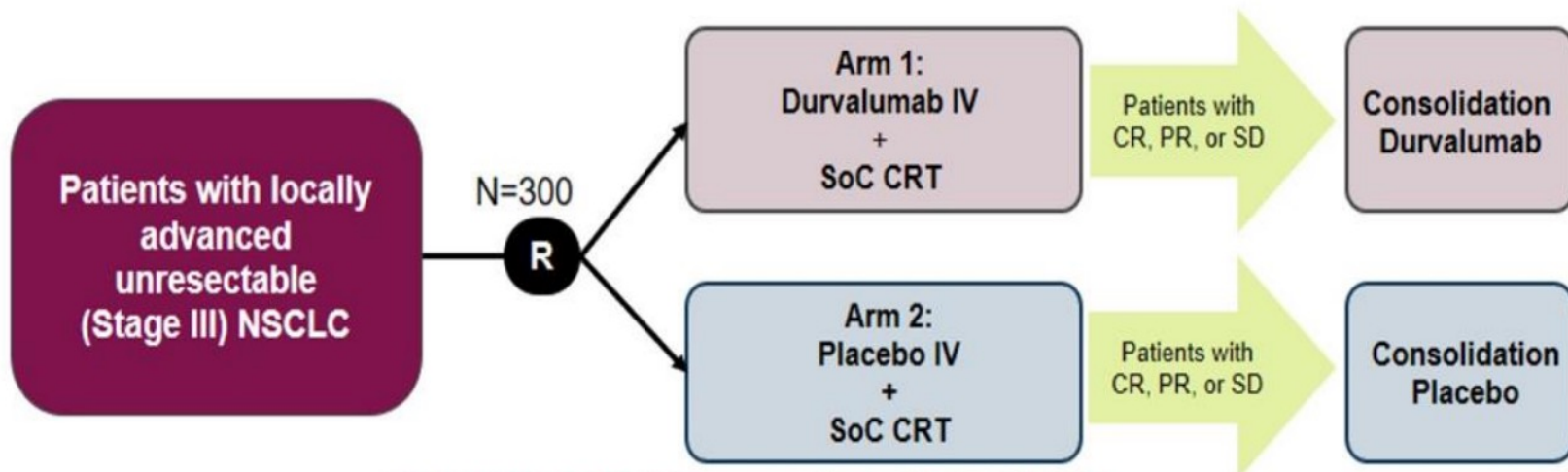
Concurrent CT-RT + immunotherapy in unresectable stage III

- ETOP-NICOLAS Phase II nivolumab
- KEYNOTE-799 Phase II pembrolizumab
- DETERRED Phase II atezolizumab
- PACIFIC-2 Phase III durvalumab
- CheckMate73L Phase III nivolumab
- NCT03840902 Phase II M7824

UPFRONT DURVALUMAB WITH CONCURRENT CHEMO/XRT

PACIFIC 2: Study Design^{1,2}

- Phase 3, randomized, double-blind, placebo-controlled, multicenter, global study



Co-primary endpoints

- PFS
- ORR

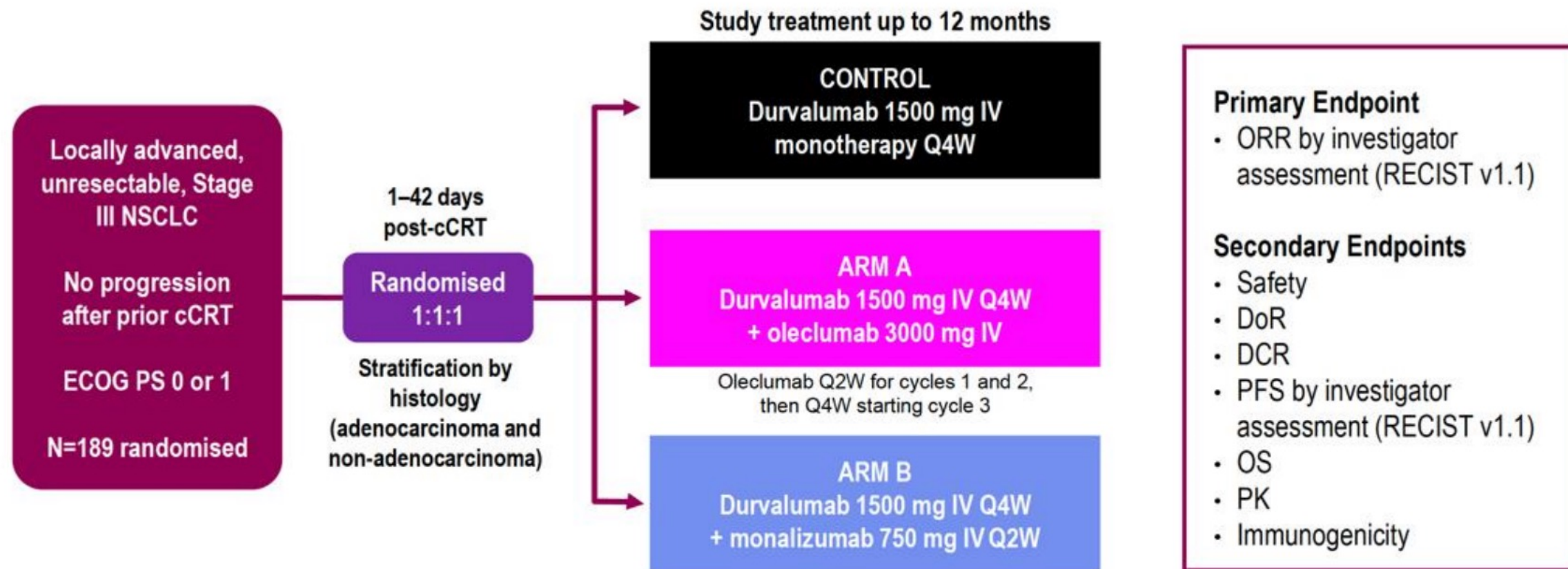
Secondary endpoints

- OS
- PK of durva in blood in combo with CRT
- Immunogenicity
- HRQoL
- DoR
- PFS2
- TTDM
- Rate of complete response

- Activated: 4/18
- N: 300
- Ex-US
- Treat until PD
- Upfront CRT & durva
- Dosing Interval/length
- PD-L1 Status

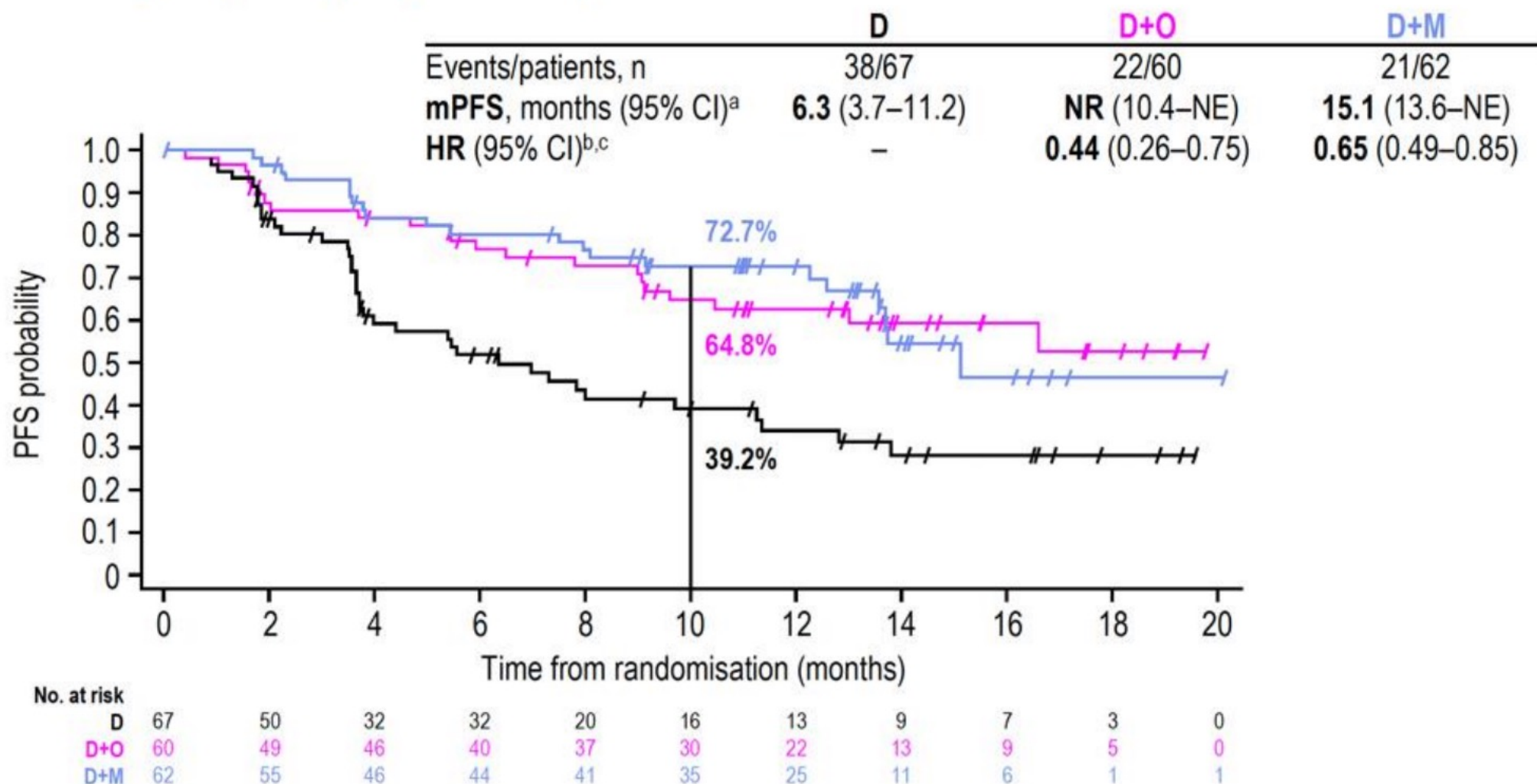
• COMPLETED ACCRUAL

COAST: Phase 2, randomised open-label study



- A planned sample size of 60 patients per arm was designed to provide acceptable precision in estimating antitumour activities in an early phase setting
- Between Jan 2019 and Jul 2020, 189 patients were randomised of whom 186 received D (n=66), D+O (n=59) or D+M (n=61)
- As of 17 May 2021, all patients had a minimum of 10 months potential follow-up and the median actual follow-up was 11.5 months (range, 0.4–23.4; all patients)

PFS by investigator assessment (interim analysis; ITT population)



Data cutoff: 17 May 2021 (median follow-up of 11.5 months; range, 0.4–23.4)

^aInterim analysis was performed when all patients had a 10-month minimum potential follow-up; Kaplan-Meier estimates for PFS, PFS rate and 95% CIs

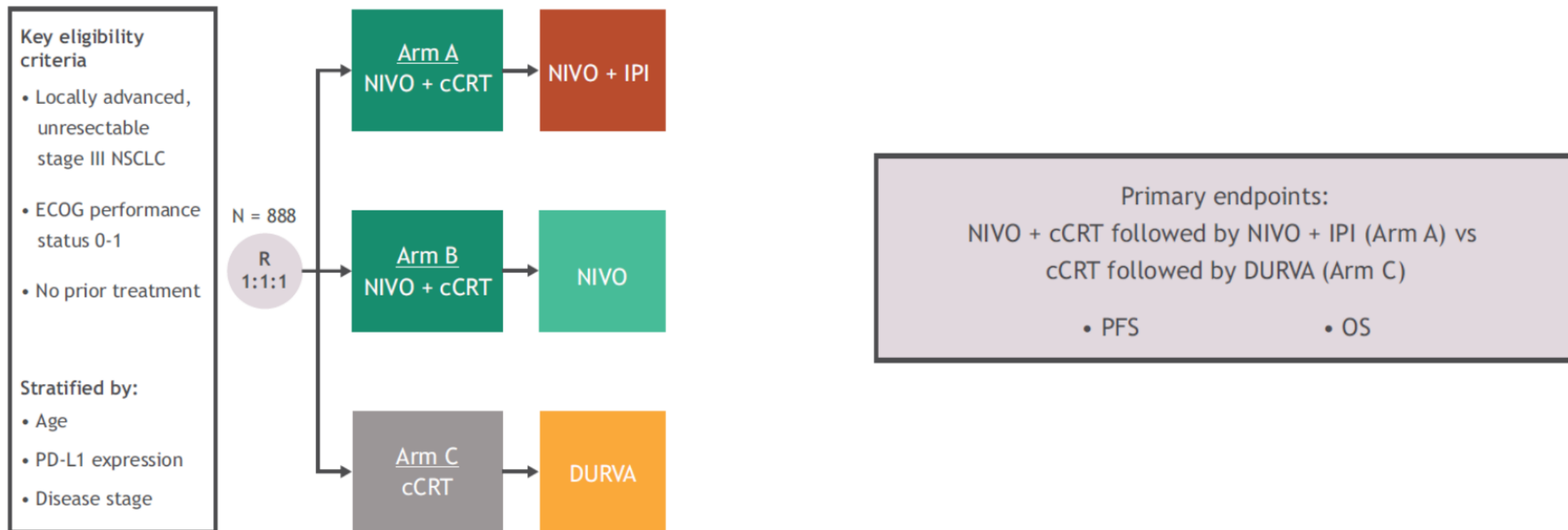
^bPFS HR and 95% CI estimated by Cox regression model, stratified by histology (adenocarcinoma and non-adenocarcinoma)

^cCompared with the 67 and 64 patients in the D arm enrolled concurrently with patients in the D+O and D+M arms, respectively

CI, confidence interval; HR, hazard ratio; ITT, intention to treat; mPFS, median PFS; NE, not estimable; NR, not reached

CheckMate 73L

A phase 3 study comparing nivolumab plus concurrent CRT followed by nivolumab ± ipilimumab versus cCRT followed by durvalumab for previously untreated, locally advanced stage III NSCLC



Study Design KEYLYNK 012

Patients:

- Stages IIIA, IIIB, and IIIC NSCLC
- ECOG PS 0-1
- Adequate pulmonary function (PFT)

Stratification:

- Stage (IIIA vs IIIB/IIIC)
- Tumor histology (squamous vs nonsquamous)
- PD-L1 tumor proportion score (≥50% vs <50%)
- Region (East Asia vs North America/Western Europe/UK vs other)

Randomization
1:1
N = 870

Arm A

Platinum doublet
+
Pembrolizumab
200 mg
X1 cycles

Arm B

Platinum doublet
+
Pembrolizumab
200 mg
X1 cycles

Arm C

Platinum doublet
+
Placebo
X1 cycles

Thoracic Radiotherapy

Platinum doublet +
Pembrolizumab
200 mg Q3W
X 2 cycles

Platinum doublet+
Pembrolizumab
200 mg Q3W
X 2 cycles

Platinum doublet
+
Placebo x 2
cycles

Pembrolizumab
200 mg Q3W
X 17 cycles
+
Olaparib Placebo
X 12 Months

Pembrolizumab
200 mg Q3W
X 17 cycles
+
Olaparib
300mg BID
X 12 Months

Durvalumab
10 mg/kg Q2W
X 12 Months

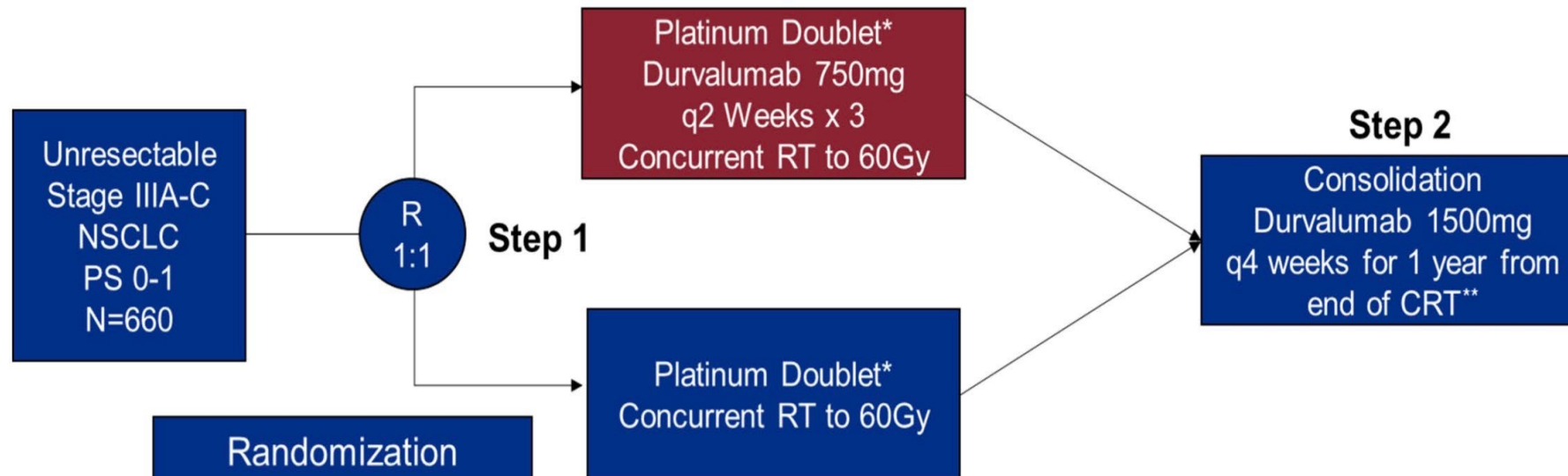
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Primary Endpoints: PFS/OS

Secondary Endpoints: ORR, DOR, PRO

Exploratory Endpoints: Biomarker evaluation, PDL1 and outcomes, TTST and TTR

Randomized Phase III Trial of MEDI4736 (durvalumab) as Concurrent and Consolidative Therapy Alone for Unresectable Stage 3 NSCLC: A trial of the ECOG-ACRIN Research Group (EA5181)



Randomization

Stratified by:

- 1) Planned chemotherapy
- 2) Age
- 3) Sex
- 4) Stage (IIIA vs IIIB vs IIIC)

*Investigator choice

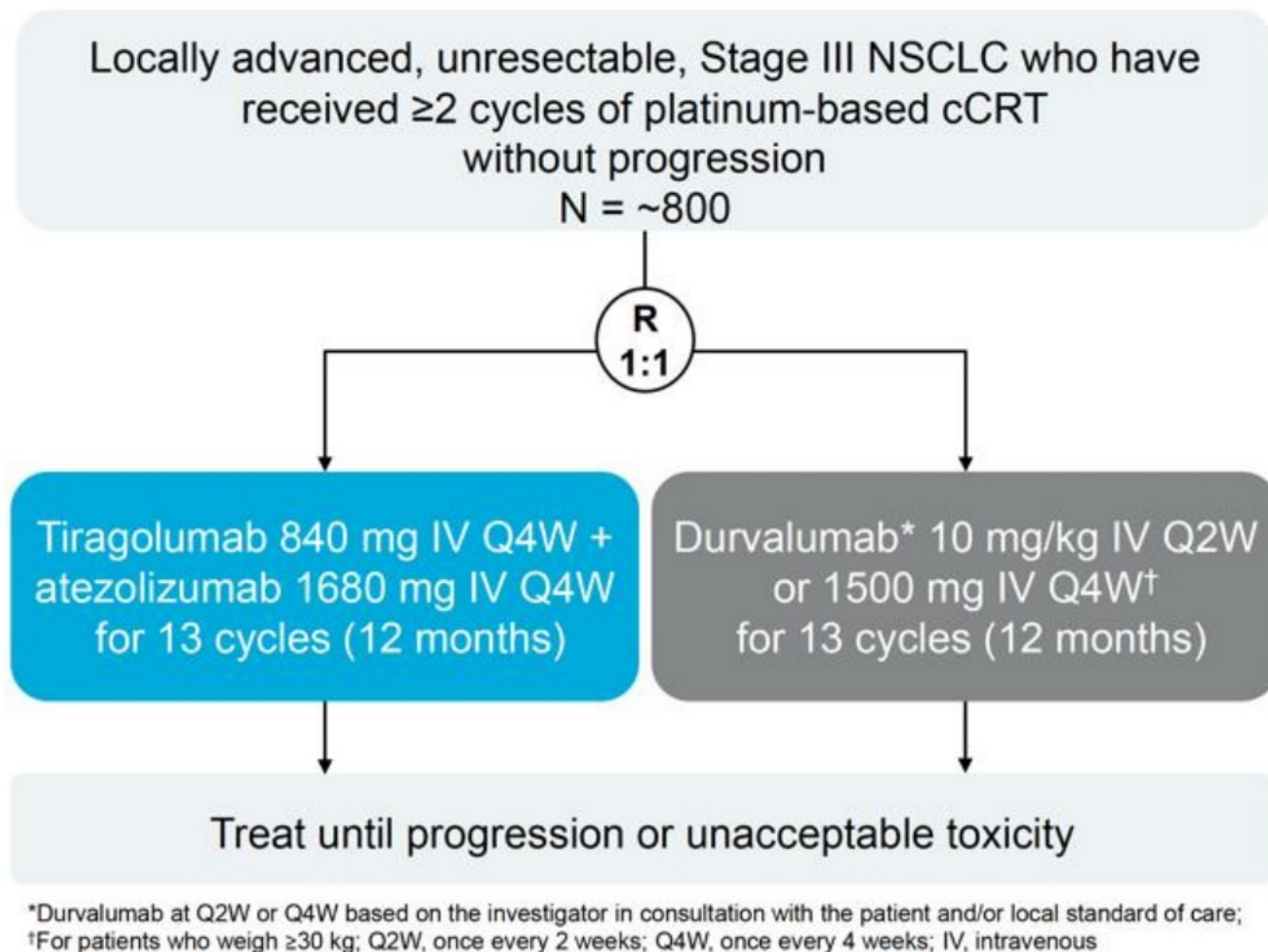
Cisplatin 50 mg/m² D1, 8, 29, 36; etoposide 50 mg/m² D1-5, 29-33

Cisplatin 75 mg/m² D1, 22; pemetrexed 500 mg/m² D1, 22 (nonsquamous only)

Carboplatin AUC 2 D1, 8, 15, 22, 29, 36; paclitaxel 45 mg/m² D1, 8, 15, 22, 29, 36

**Starting within 14 days of CRT unless toxicity has not resolved to \leq grade 2, but not later than 45 days post-CRT

SKYSCRAPER-03:



Primary endpoint:
PFS by independent review facility assessment per RECIST v1.1

Key secondary endpoints:
OS, investigator-assessed PFS, ORR, DOR, PFS and OS rates at 12, 18 and 24 months

Safety, pharmacokinetics, immunogenicity and biomarkers will also be evaluated

Stage I NSCLC: SBRT + IO Combinations

Study Name	Phase	Arm I SBRT	Arm II SBRT + IO	Placebo	Primary Endpoints
PACIFIC-4 N = 706	III	Standard of care 3, 4, 5 or 8 fraction regimens	SBRT followed by Durvalumab 1500 mg Q 4 w x 24 months	Yes	PFS
SWOG/NRG S1914 N = 480	III	Standard of care 3-5 fractions	Atezolizumab x Q 3 w x 2 → SBRT + Atezolizumab → Atezolizumab (8 cycles total)	No	EFS, OS
KEYNOTE-867 N = 530	III	Standard of care 3 – 5 fractions	SBRT followed by Pembrolizumab 200 mg Q 3 week x 12 months	Yes	OS