



POST ESMO

from
BARCELONA



to
REAL WORLD



— ROMA —

NH Collection Vittorio Veneto - C.so d'Italia, 1

2 - 3 Dicembre 2019

Sessione BREAST

Nuove prospettive ABC

GIULIANA D'AURIA
UOC Oncologia ASL Roma 2
Osp Pertini-S.Eugenio-CTO



Disclosures

Scientific advisory board, meeting, congress:

- ✓ Novartis
- ✓ Roche
- ✓ Pfizer
- ✓ Pierre Fabre
- ✓ Eisai
- ✓ Amgen

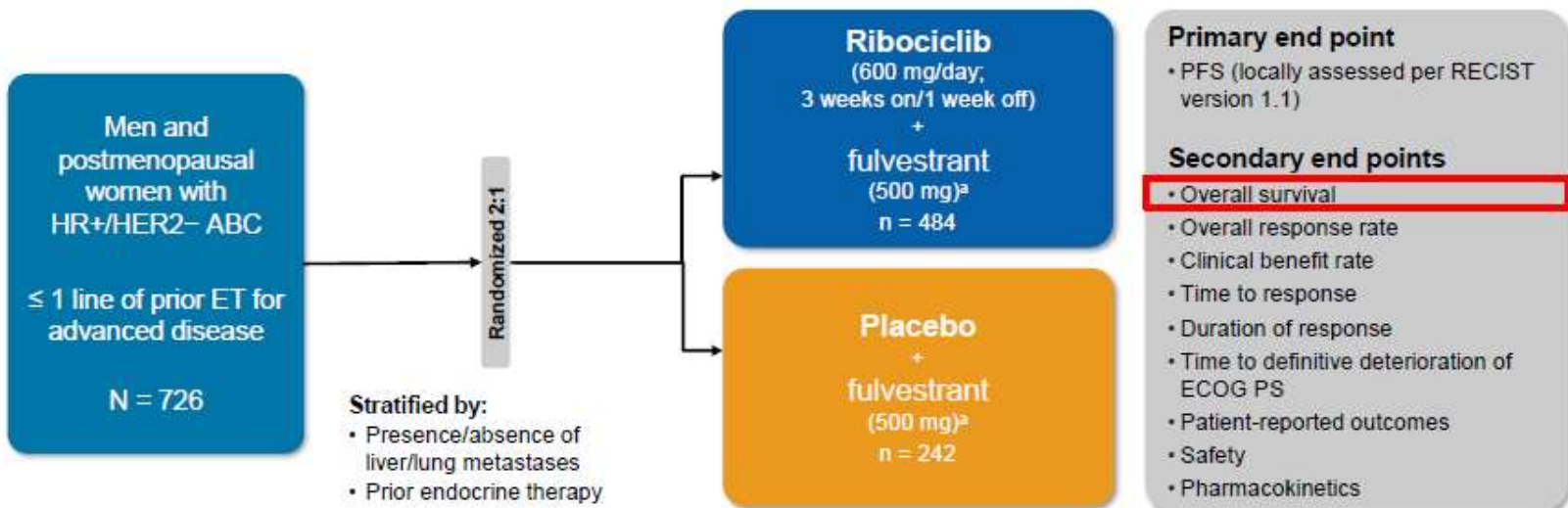


OUTLINE

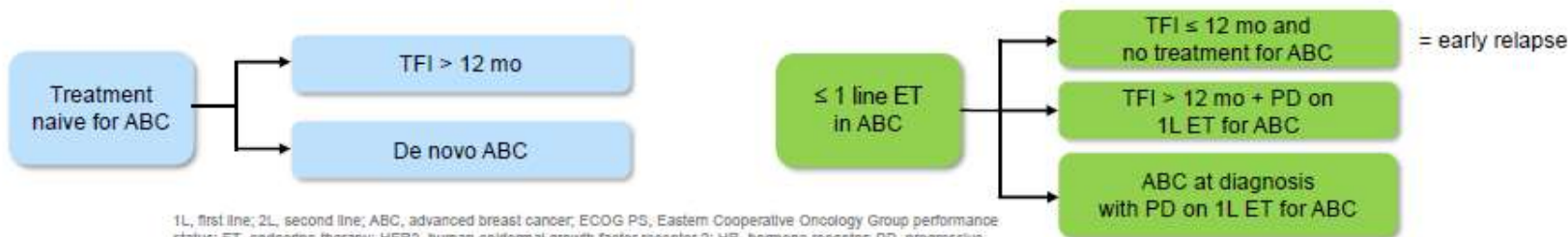
- ✓ **Monaleesa 3 & Monarch 2**
- ✓ **BROCADE 3**
- ✓ **Keynote-119**

MONALEESA 3

MONALEESA-3 Study Design



Patient population definitions



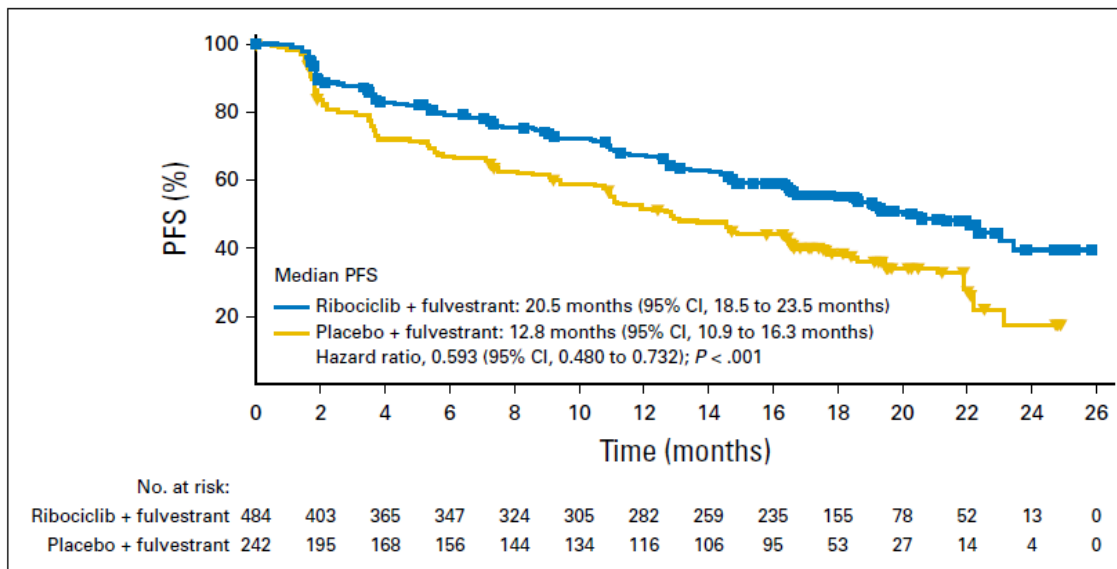
1L, first line; 2L, second line; ABC, advanced breast cancer; ECOG PS, Eastern Cooperative Oncology Group performance status; ET, endocrine therapy; HER2, human epidermal growth factor receptor 2; HR, hormone receptor; PD, progressive disease; PFS, progression-free survival; RECIST, Response Evaluation Criteria In Solid Tumors; TFI, treatment-free interval.
^a Fulvestrant 500 mg intramuscularly every 28 days plus an additional dose on Cycle 1, Day 15.
 Slamon DJ, et al. *J Clin Oncol*. 2018;36:2465-247.

RIBOCICLIB I-II line: Monaleesa 3

726 pts ER+ HER2- I line ~50%

Prior endocrine therapy setting		
(Neo)adjuvant	289 (59.7)	142 (58.7)
Advanced	110 (22.7)	40 (16.5)

Cut-off 12 mos



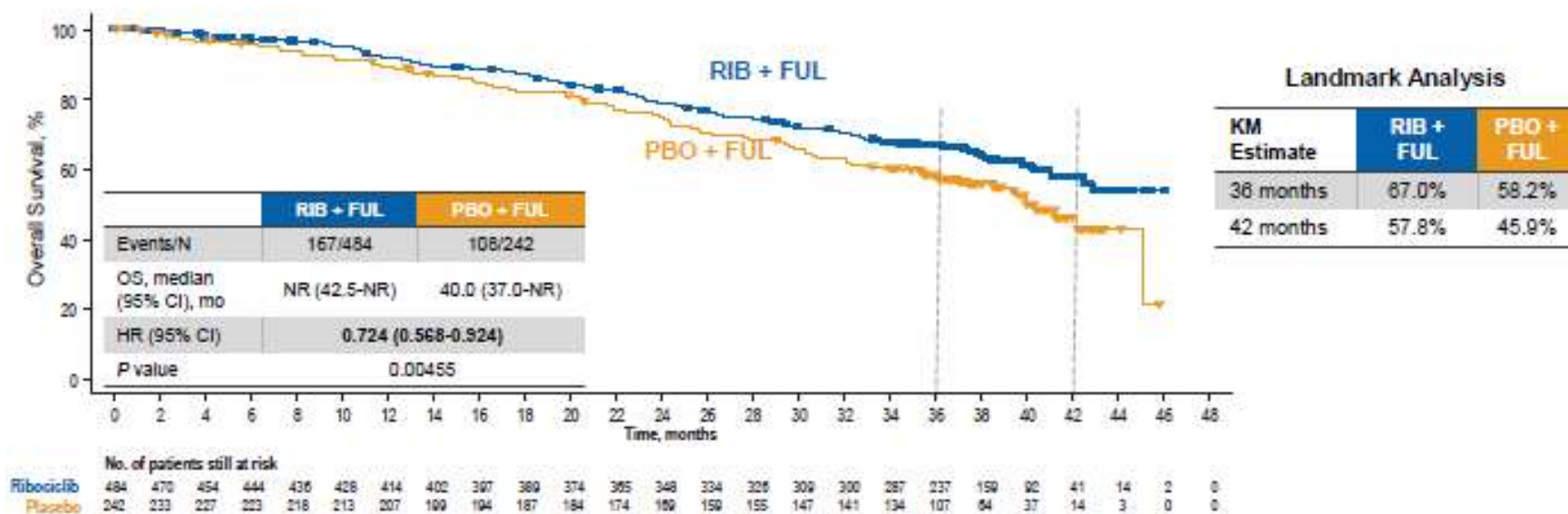
PFS 20.5 months vs 12.8 months

HR 0.59

MONALEESA 3

Overall Survival

The reduction in relative risk of death with RIB was 28%

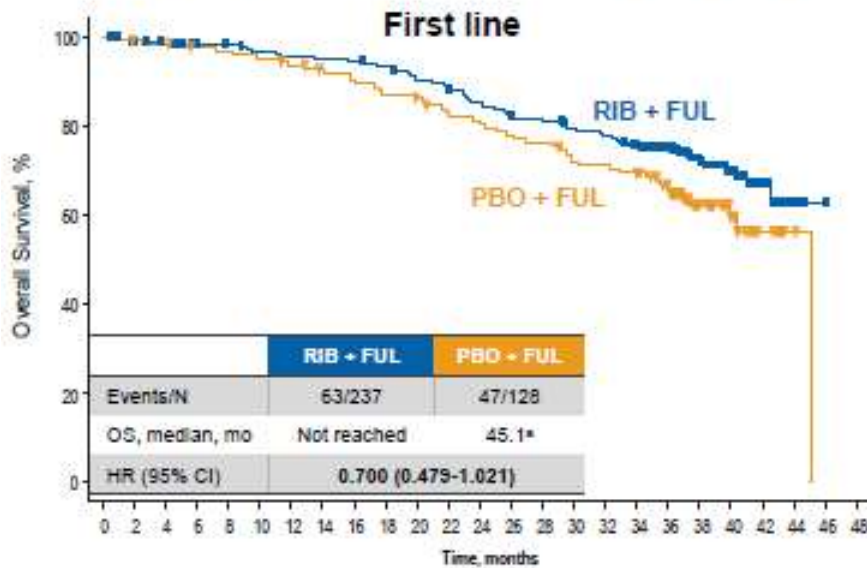


- The *P* value of 0.00455 crossed the prespecified boundary to claim superior efficacy ($P < 0.01129$)

MONALEESA 3

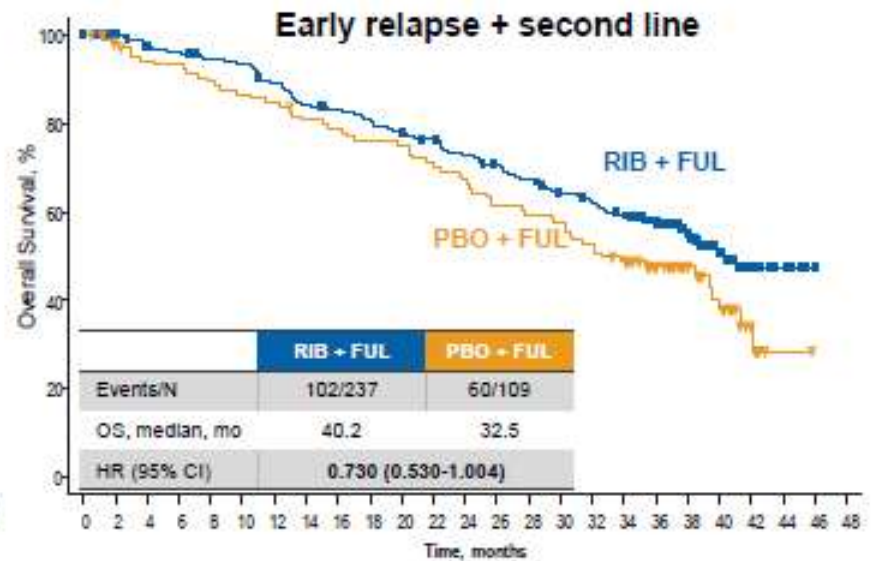
Overall Survival by Line of Therapy

OS by line of therapy was consistent with overall population



No. of patients still at risk

Time, months	0	2	4	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40	42	44	46	48
Ribociclib	237	229	222	217	214	210	207	206	205	202	194	190	182	174	173	168	163	157	138	92	54	22	8	1	0
Placebo	128	126	120	122	121	119	118	113	110	106	104	99	97	93	91	85	84	82	70	40	21	8	2	0	0

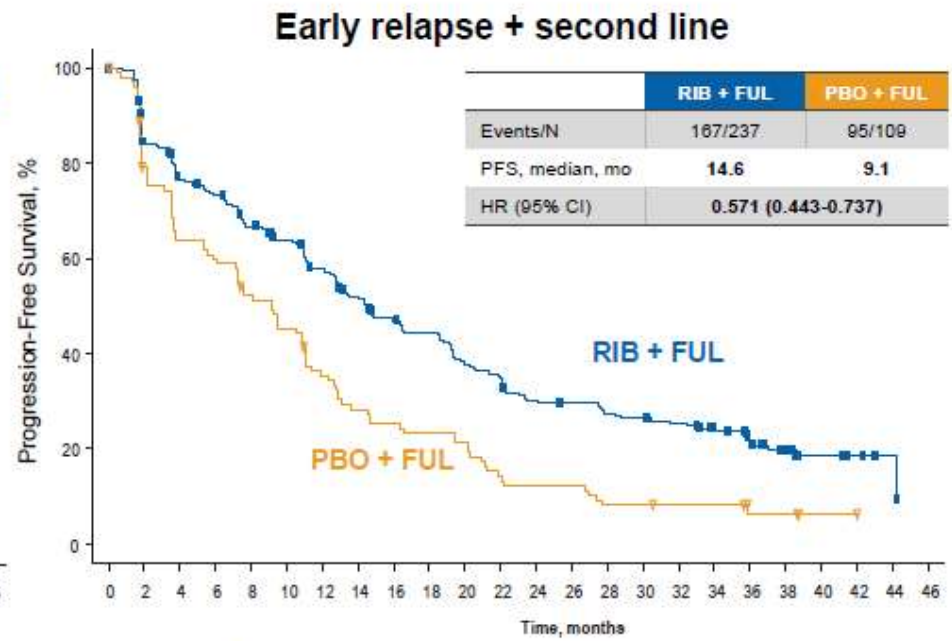
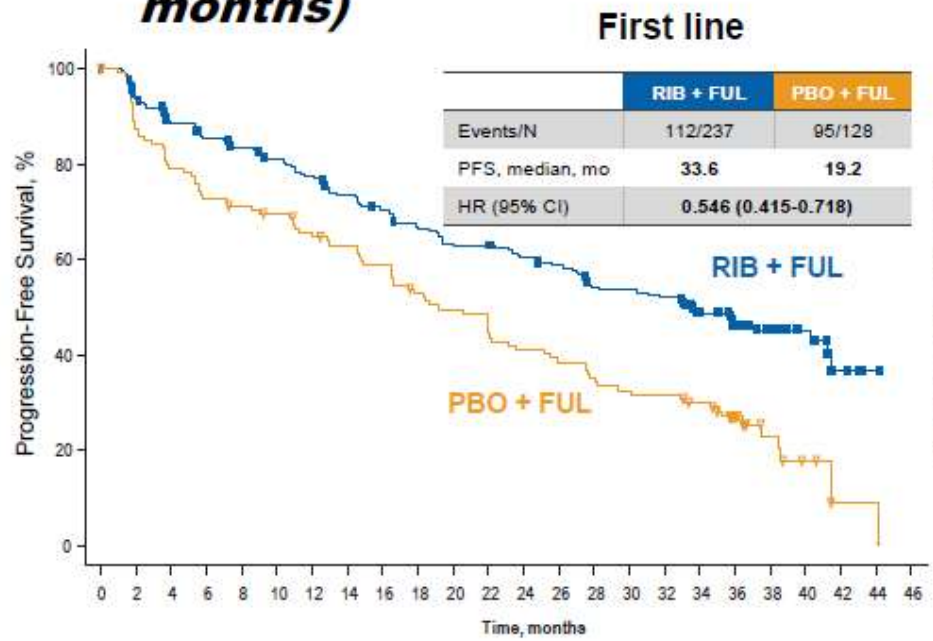


No. of patients still at risk

Time, months	0	2	4	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40	42	44	46	48
Ribociclib	237	231	222	218	213	210	199	188	184	179	172	167	158	152	145	135	129	122	94	63	36	17	7	1	0
Placebo	109	103	98	97	93	90	88	83	81	78	77	72	69	63	61	59	54	49	35	23	15	8	1	0	0

MONALEESA 3

Progression-Free Survival by Line of Therapy Median PFS for RIB + FUL is now reached in first line (33.6 months)



No. of patients still at risk

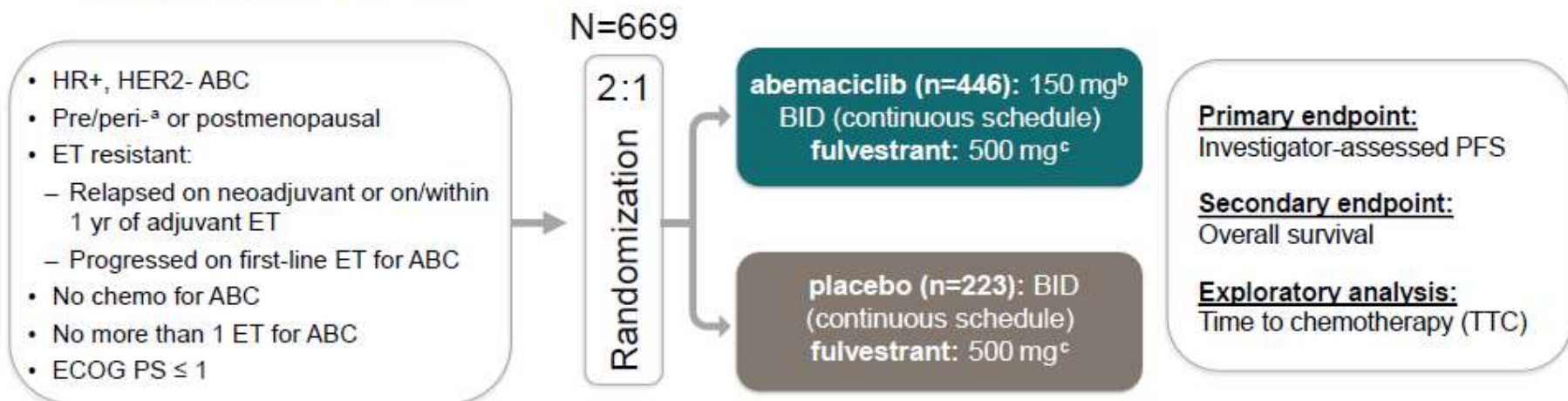
Time (months)	0	2	4	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40	42	44	46
Ribociclib	237	204	187	178	171	164	157	147	140	132	125	123	117	113	102	101	98	84	63	44	20	7	2	0
Placebo	128	109	99	91	88	85	78	75	70	62	58	52	48	45	41	38	37	33	17	9	5	1	1	0

No. of patients still at risk

Time (months)	0	2	4	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40	42	44	46
Ribociclib	237	189	168	160	144	134	119	105	93	87	74	69	58	56	52	50	47	41	27	19	9	4	2	0
Placebo	109	82	66	62	53	46	35	28	25	23	21	14	12	12	8	8	7	7	3	3	1	1	0	0

MONARCH 2

STUDY DESIGN



Stratification factors:

- Metastatic site (visceral, bone only, or other)
- ET resistance (primary or secondary)^{7,8}

- Data cut-off: 20 June 2019
- Median follow-up: 47.7 months
 - 17% patients (abemaciclib arm) vs 4% (placebo arm) remained on treatment

^aRequired to receive GnRH agonist

^bDose reduced by protocol amendment in all new and ongoing patients from 200 mg to 150 mg BID after 178 patients enrolled

^cFulvestrant administered per label

Abbreviations: N, number of patients in population; n, number of patients

⁷Cardoso et al. *Breast.* 2017;35:203-217; ⁸Cardoso et al. *Ann Oncol.* 2017;28(12):3111

ABEMACICLIB I & II line: Monarch 2

**669 pts ER+ HER2-
17% PREMENOPAUSAL**

Primary resistance 25%

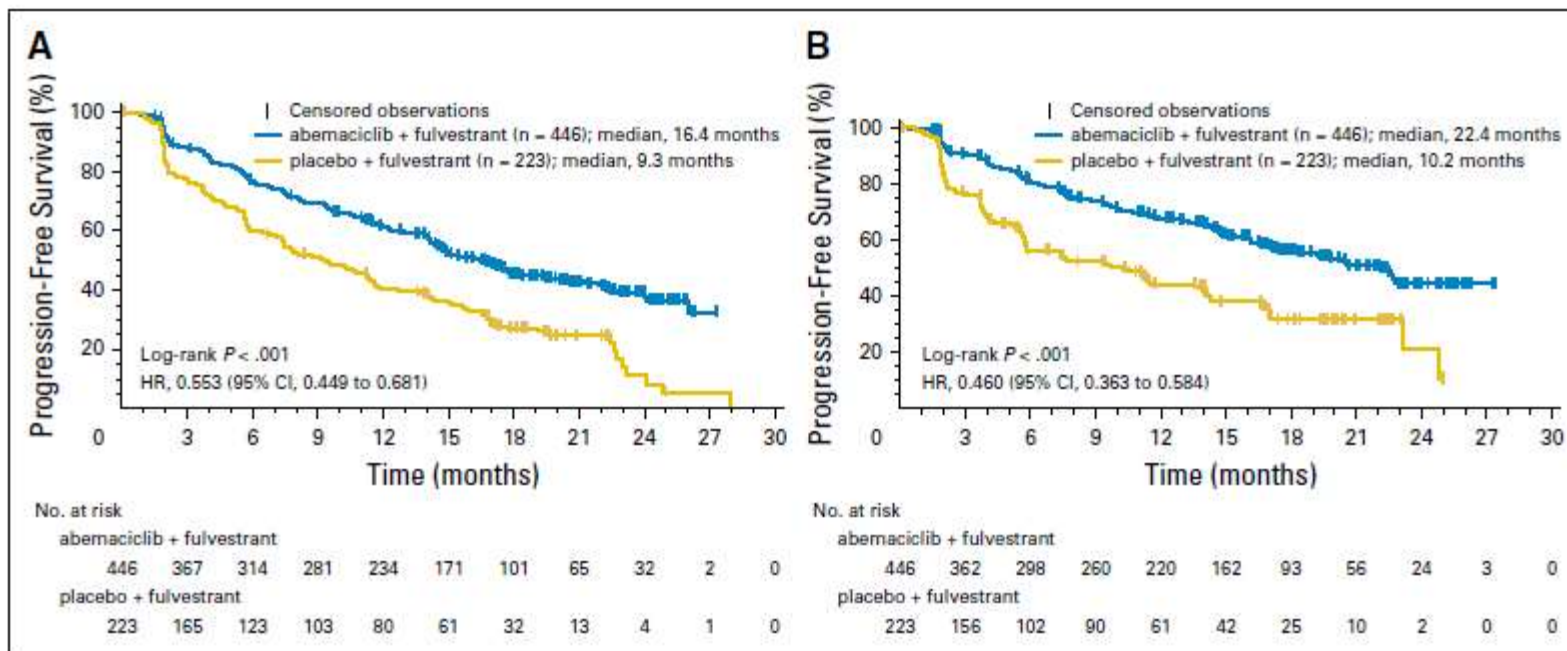


Fig 2. Kaplan-Meier plots of progression-free survival. (A) Investigator-assessed and (B) independent central review of intent-to-treat population. HR, hazard ratio.

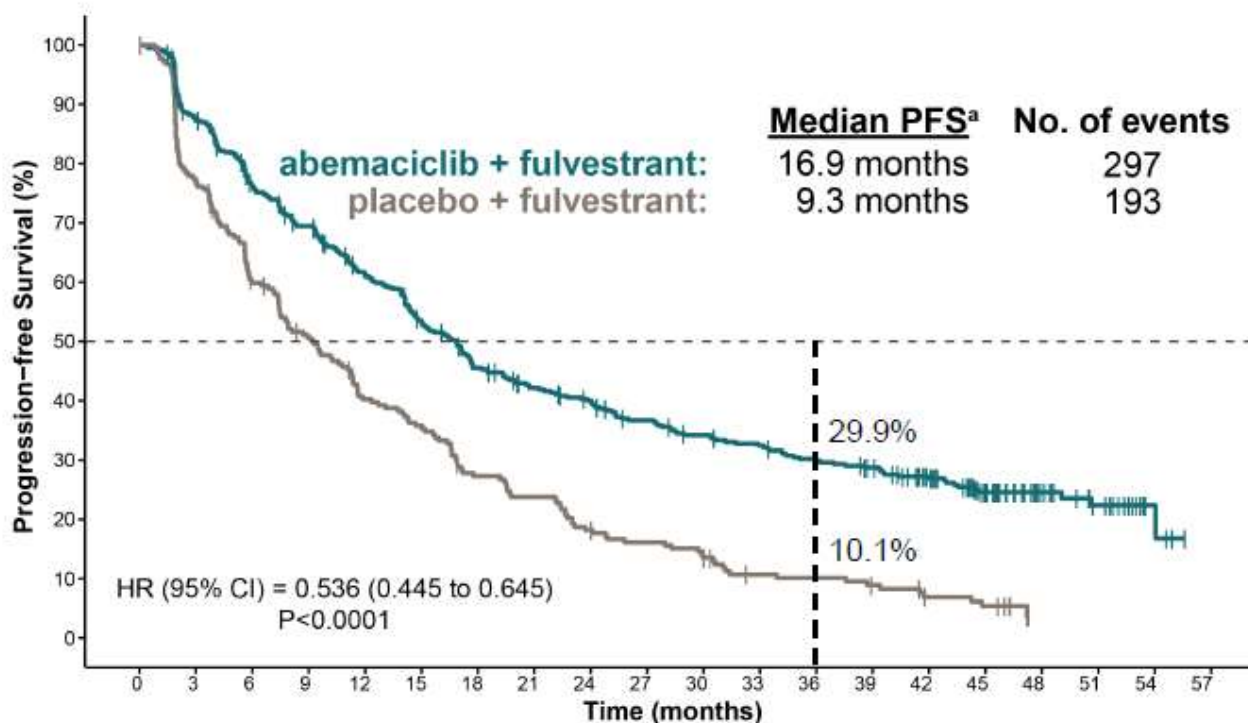
PFS 16.4 months vs 9.3 months

HR 0.55

Sledge, JCO 2017

MONARCH 2

UPDATED PROGRESSION-FREE SURVIVAL



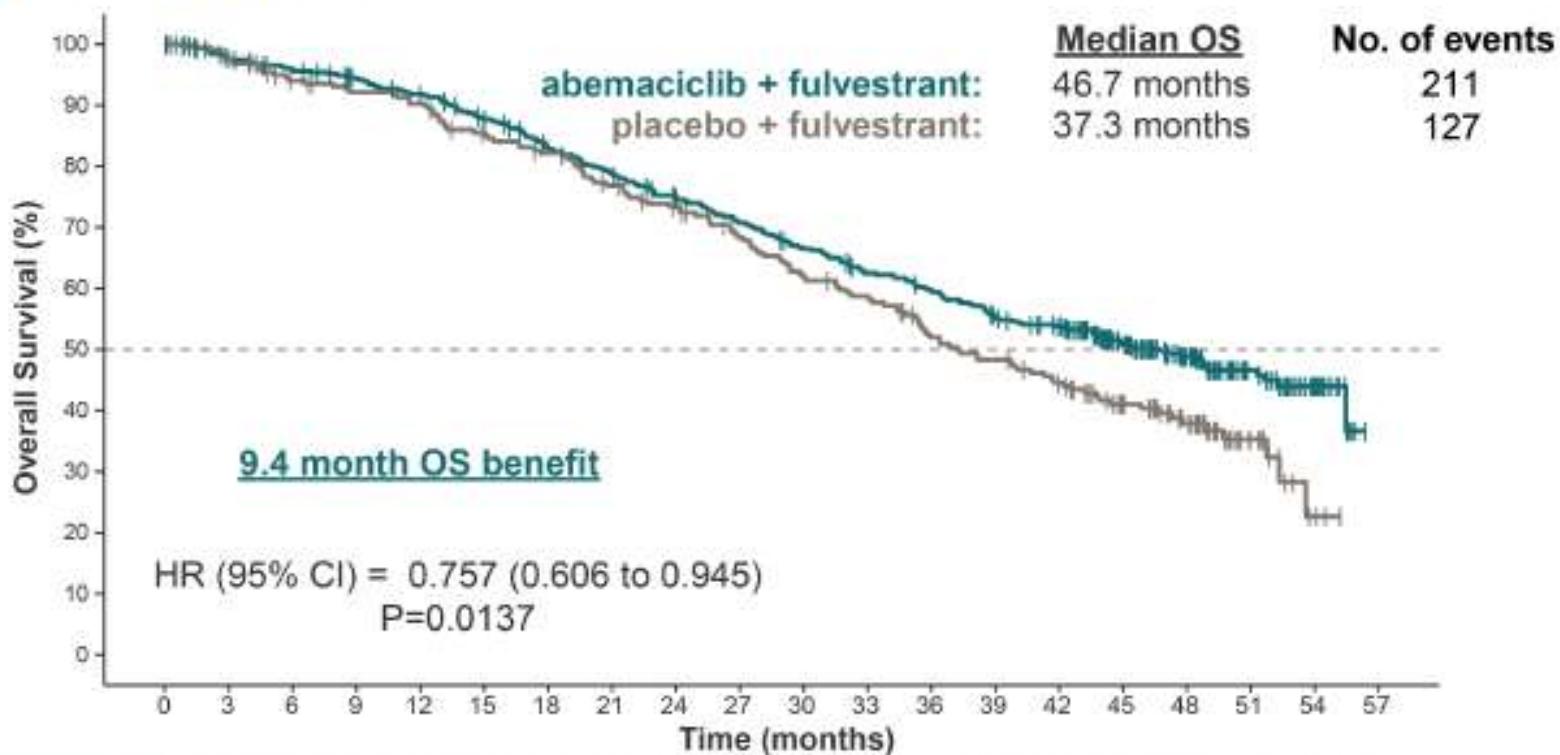
No. at risk

	0	3	6	9	12	15	18	21	24	27	30	33	36	39	42	45	48	51	54	57
abemaciclib + fulvestrant	446	365	312	280	242	208	176	158	147	132	121	114	104	97	78	53	28	18	4	0
placebo + fulvestrant	223	165	124	103	81	72	54	47	36	31	26	18	17	14	9	7	0	0	0	0

^aPFS results at primary analysis: Median: 16.4 vs 9.3 months (HR: 0.553; 95% CI: 0.449, 0.681; P < 0.001), 222 events abemaciclib arm vs 157 events placebo arm

MONARCH 2

OVERALL SURVIVAL

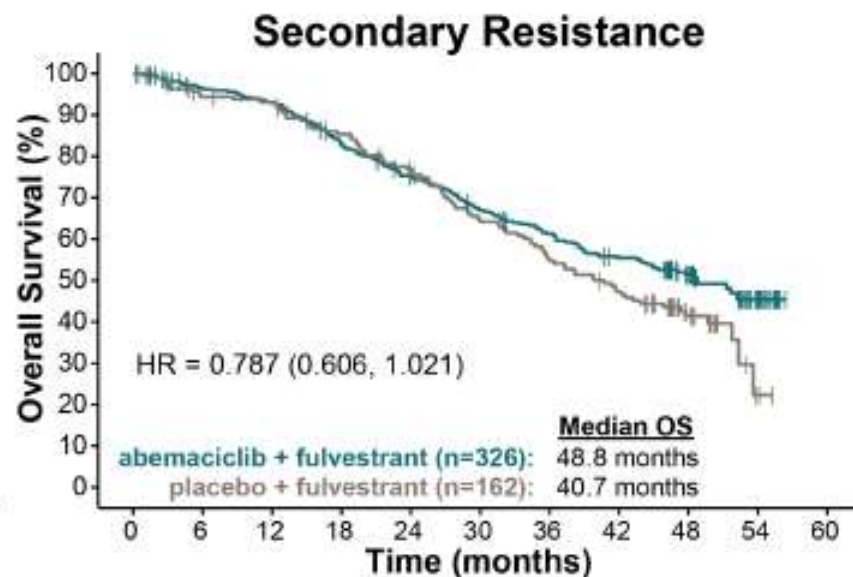
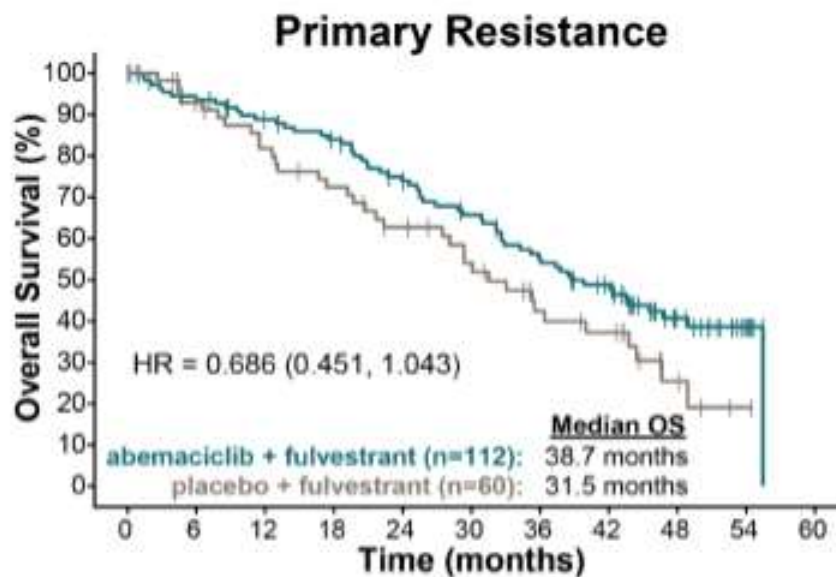


No. at risk

	0	3	6	9	12	15	18	21	24	27	30	33	36	39	42	45	48	51	54	57
abemaciclib + fulvestrant	446	422	410	397	384	364	339	321	302	284	265	246	234	214	202	157	101	58	23	0
placebo + fulvestrant	223	214	201	195	191	178	170	158	148	135	122	115	99	92	82	62	42	15	3	0

MONARCH 2

OVERALL SURVIVAL BY RESISTANCE TO ENDOCRINE THERAPY^a



^aInteraction P-value: 0.588

Definitions of endocrine resistance in ER+ MBC



PRIMARY ENDOCRINE RESISTANCE

Relapse while on the first 2 years of adjuvant ET, or PD within first 6 months of 1st line ET for MBC, while on ET

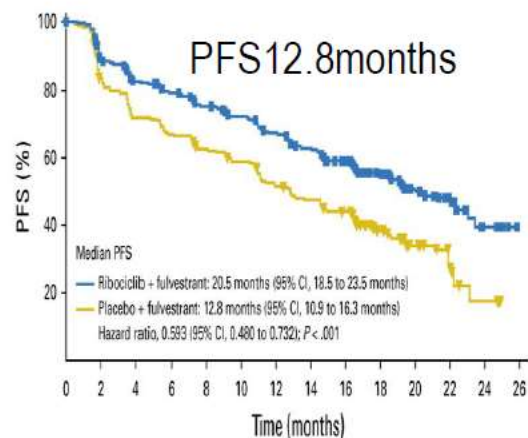


SECONDARY (ACQUIRED) ENDOCRINE RESISTANCE

Relapse while on adjuvant ET but after the first 2 years, or relapse within 12 months of completing adjuvant ET, or PD ≥ 6 months after initiating ET for MBC, while on ET

PFS data of fulvestrant + CDK 4/6 inhibitor Phase III trials in ET pretreated

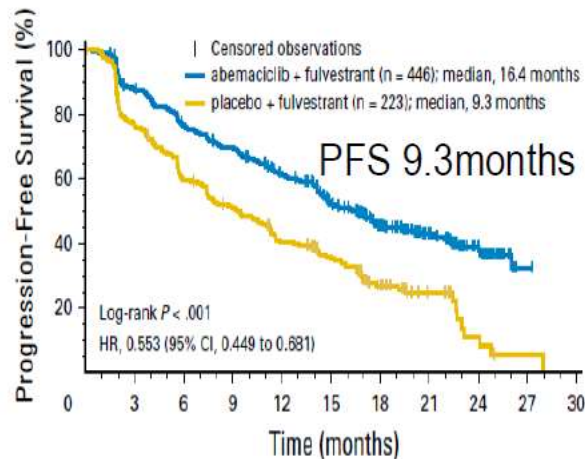
MONALEESA-3¹



No. at risk:

Ribociclib + fulvestrant	484	403	365	347	324	305	282	259	235	155	78	52	13	0
Placebo + fulvestrant	242	195	168	156	144	134	116	106	95	53	27	14	4	0

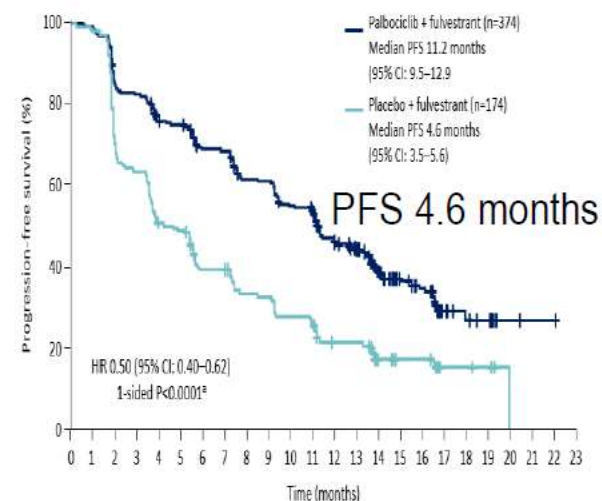
MONARCH-2²



No. at risk

abemaciclib + fulvestrant	446	367	314	281	234	171	101	65	32	2	0
placebo + fulvestrant	223	165	123	103	80	61	32	13	4	1	0

PALOMA-3³



Number of patients at risk

PAL + FUL	347	324	276	271	245	242	215	214	189	188	168	162	137	119	69	45	38	15	12	9	2	1	1	0
PCB + FUL	174	162	112	105	83	80	61	61	51	50	43	41	29	29	15	11	11	4	4	3	1	0	0	0

Level of pretreatment increases and PFS in control arm decreases

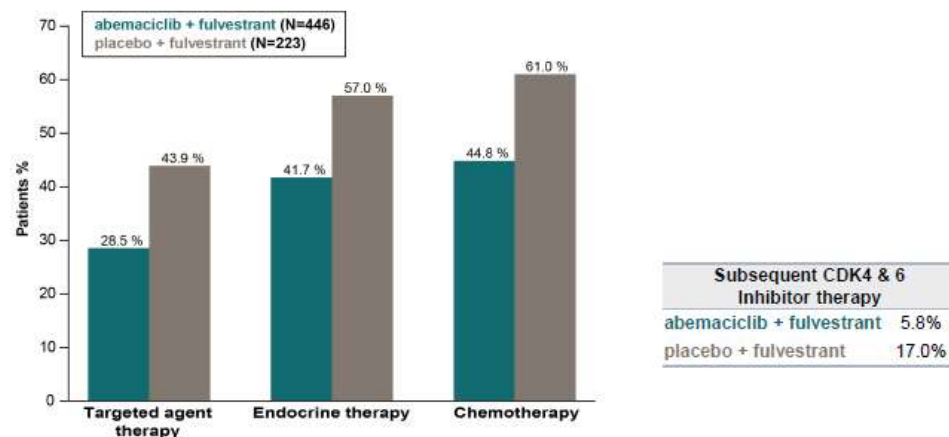
Monaleesa 3 e Monarch 2

Subsequent Therapy After Discontinuation

First Subsequent Therapy After Discontinuation by Type, n (%) ^a	RIB + FUL n = 484	PBO + FUL n = 242
	n discontinued = 362	n discontinued = 209
Any medication	295 (81.5)	177 (84.7)
Chemotherapy alone	84 (23.2)	42 (20.1)
Chemotherapy + hormone therapy/other ^b	46 (12.7)	33 (15.8)
Hormone therapy alone	94 (26.0)	38 (18.2)
Hormone therapy + other ^c	66 (18.2)	61 (29.2)
Targeted therapy alone	5 (1.4)	3 (1.4)

- CDK4/6 inhibitors as any line of subsequent therapy after discontinuation were received by 11% of patients in the RIB arm and 25% of patients in the PBO arm

POST DISCONTINUATION THERAPY

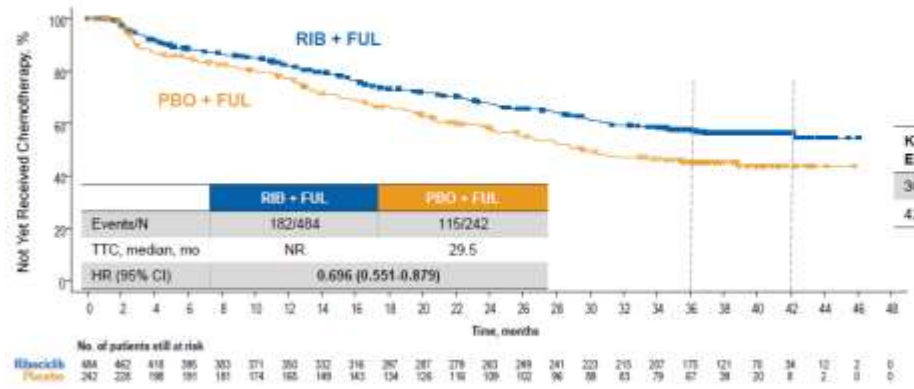


At the time of data cutoff, a total of 584 patients in the ITT population had discontinued from study treatment (82.7% (n=369) in abemaciclib arm, 96.4% (n=215) in the placebo arm)

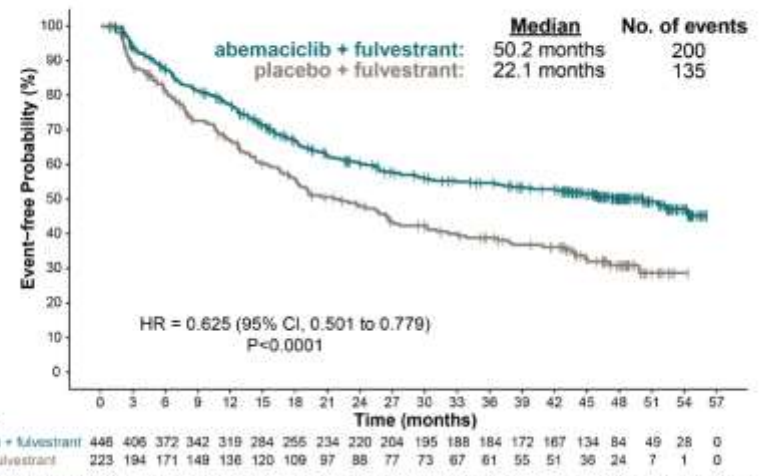
Monaleesa 3 e Monarch2

Time to First Chemotherapy

Time to first chemotherapy was longer with RIB + FUL



EXPLORATORY ANALYSIS: TIME TO CHEMOTHERAPY^a



^aTime to chemotherapy was analyzed from randomization to initiation of first post discontinuation chemotherapy (censoring patients who died prior to initiation of chemotherapy)



OUTLINE

- ✓ **Monaleesa 3 & Monarch 2**
- ✓ **BROCADE 3**
- ✓ **Keynote-119**

OLYMPIA-D & EMBRACA; Phase III PARPi Trials

Pts with HER2-negative MBC with deleterious or suspected deleterious gBRCA mutation; previous anthracycline and taxane, ≤ 2 previous lines of CT* for metastatic disease; if HR+, not suitable for ET or progressed on ≥ 1 ET (N = 302)

2:1

Olaparib 300 mg PO BID (n = 205)

CT* on 20-d cycles (n = 97)

Pts with HER2-negative LABC or MBC with deleterious or suspected deleterious gBRCA mutation; stratified by previous lines of CT* 0 or ≥ 1 if Hs CNS met or not

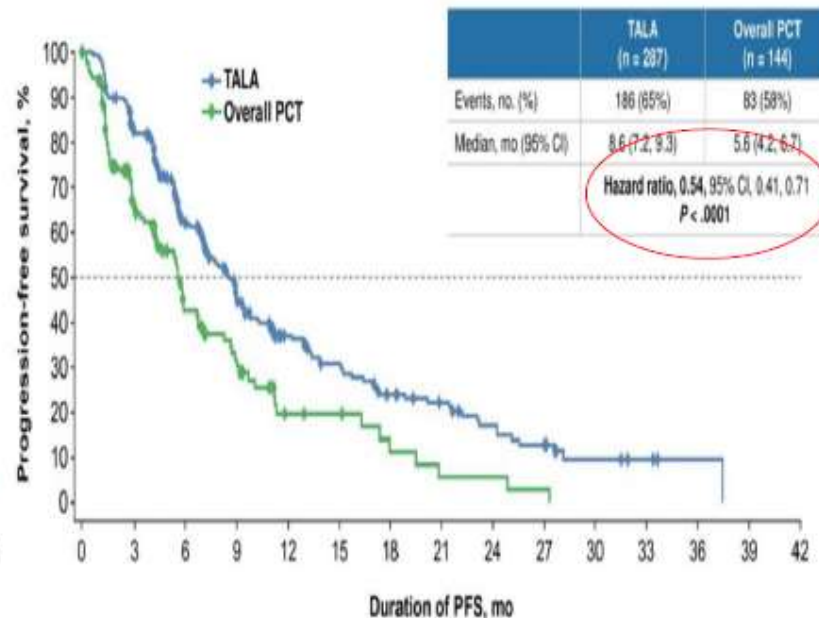
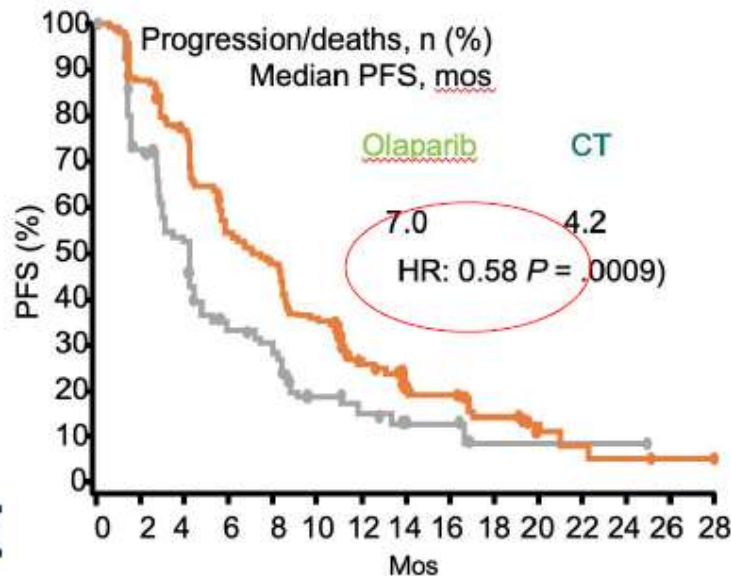
2:1

Talazoparib 1 mg PO QD (n = 287)

CT on 21(28-d) cycles (n = 144)

OLYMPIAD

EMBRACA



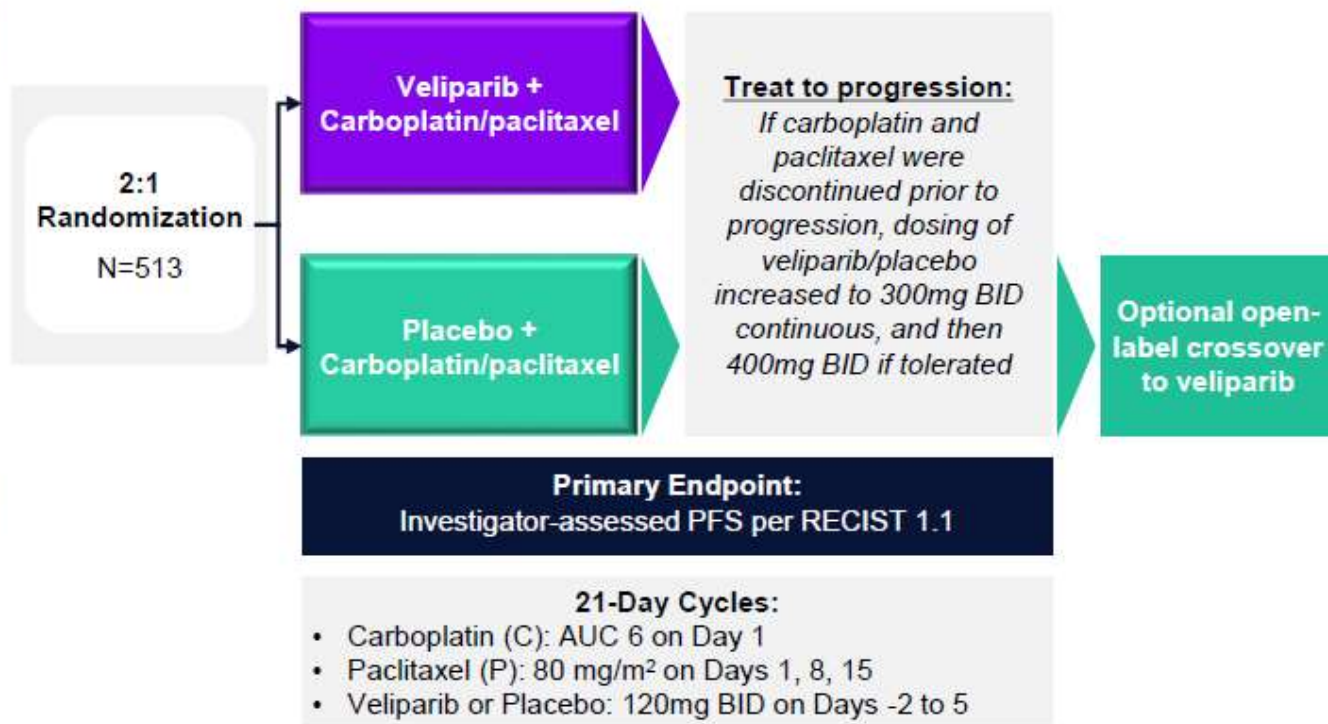
Study Design: BROCADE3 (NCT02163694)

Patient Population

- Advanced HER2-negative breast cancer
- Germline *BRCA1* or *BRCA2* mutation
- ≤2 prior lines cytotoxic therapy for metastatic disease
- ≤1 prior lines of platinum; no progression ≤12 months of completing

Stratification Factors

- Hormone Receptor Expression
- Prior Platinum
- CNS Metastasis



Patient Characteristics (2)

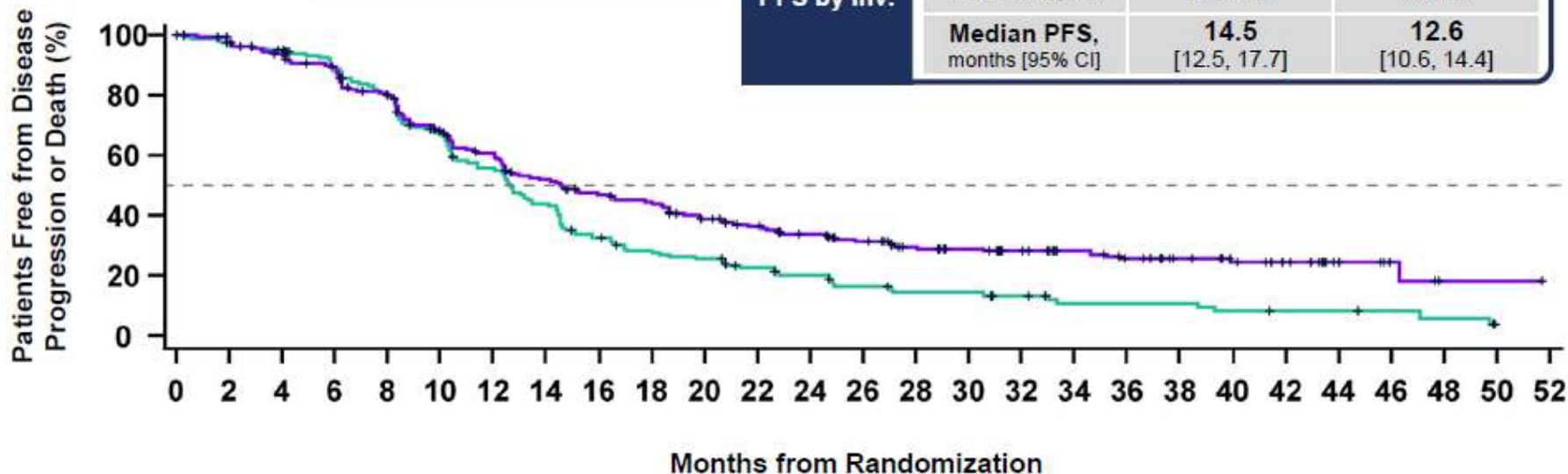
Characteristic, no. (%)	Veliparib + C/P (N = 337)	Placebo + C/P (N = 172)
Hormone Receptor Expression		
ER and/or PgR pos	174 (52)	92 (54)
ER and PgR neg	163 (48)	80 (47)
BRCA Mutation Status		
BRCA1 Mutation	177 (53)	89 (52)
BRCA2 Mutation	167 (50)	86 (50)
Measurable Disease		
Yes	285 (85)	143 (84)
No	52 (15)	28 (16)
ECOG Performance Status		
0	208 (62)	102 (59)
1	121 (36)	63 (37)
2	8 (2)	7 (4)

Characteristic, no. (%)	Veliparib + C/P (N = 337)	Placebo + C/P (N = 172)
Prior Platinum		
Yes	27 (8)	16 (9)
No	310 (92)	156 (91)
Prior (Neo)-Adjuvant Chemotherapy		
Yes	236 (70)	113 (66)
No	101 (30)	59 (34)
Prior Chemotherapy for Metastatic Disease		
Yes	63 (19)	33 (19)
No	274 (81)	139 (81)
History of CNS Metastases		
Yes	16 (5)	10 (6)
No	320 (95)	161 (94)

Primary Endpoint: PFS by Investigator Assessment

HR 0.705
[95% CI 0.566-0.877], p = 0.002

PFS by Inv.	Veliparib + C/P	Placebo + C/P
	PFS Events, n/N	217/337
Median PFS, months [95% CI]	14.5 [12.5, 17.7]	12.6 [10.6, 14.4]

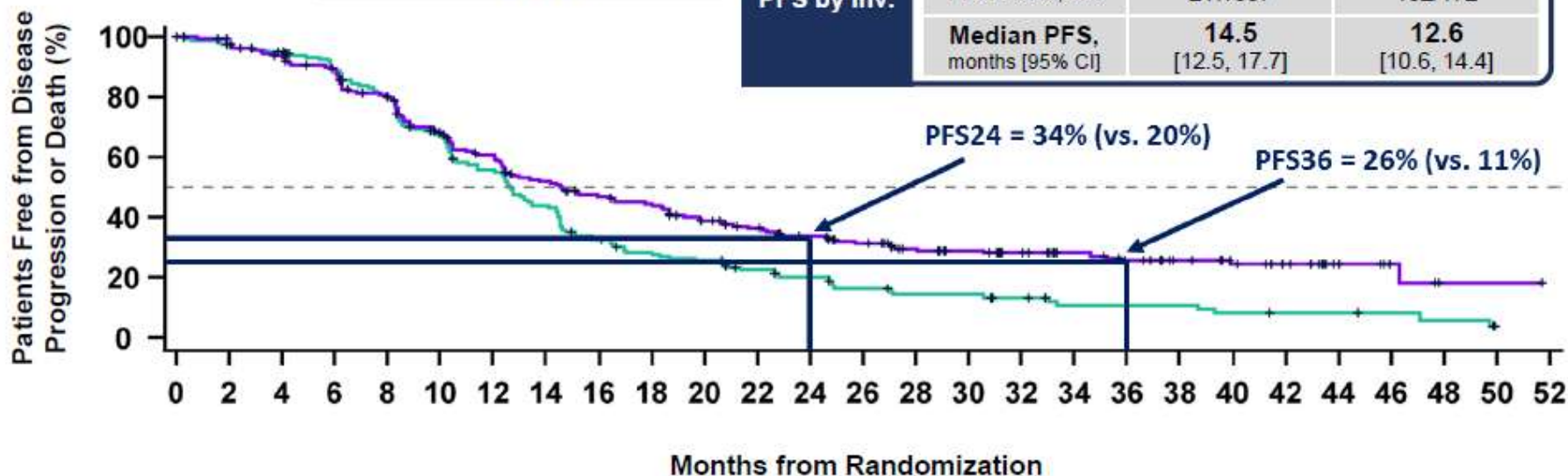


	No. at Risk																										
Control	172	160	153	140	123	99	82	64	47	39	35	27	23	18	15	15	12	8	8	8	6	5	5	4	3	0	
Veliparib	337	316	301	282	250	207	181	154	137	126	107	92	81	72	60	51	45	38	32	25	20	16	8	4	1	1	0

Primary Endpoint: PFS by Investigator Assessment

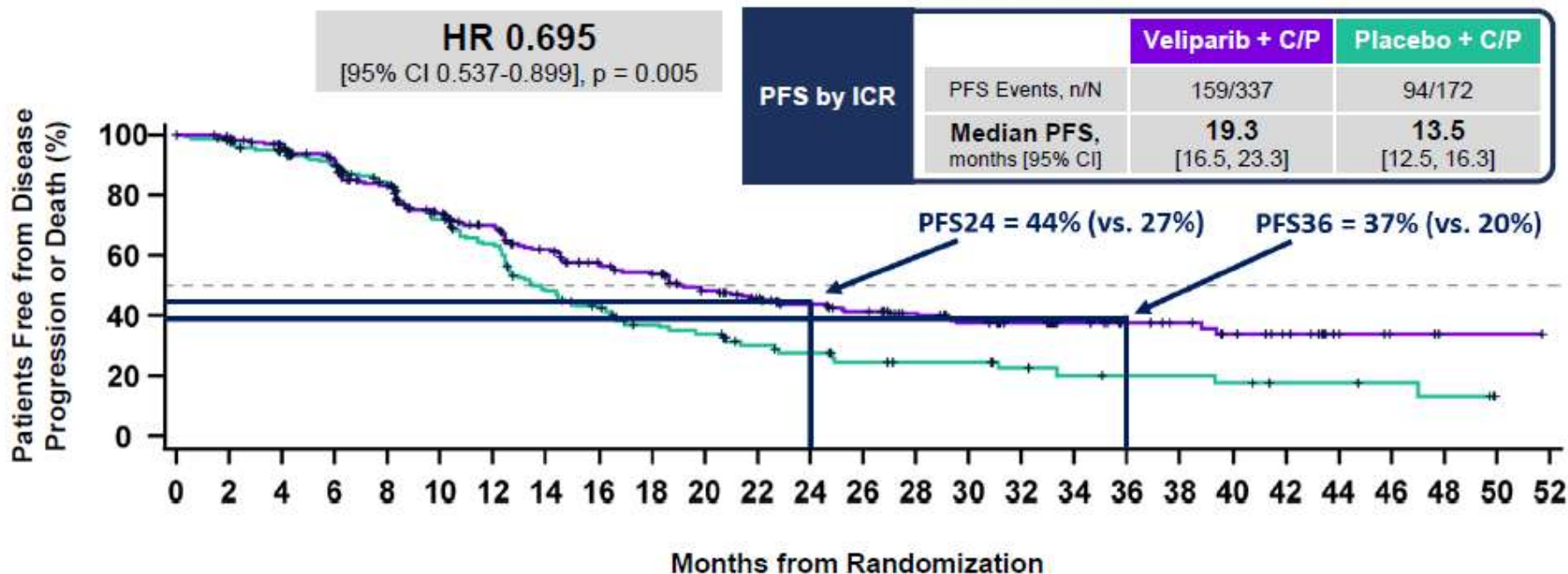
HR 0.705
[95% CI 0.566-0.877], p = 0.002

PFS by Inv.	Veliparib + C/P	Placebo + C/P
	PFS Events, n/N	217/337
Median PFS, months [95% CI]	14.5 [12.5, 17.7]	12.6 [10.6, 14.4]



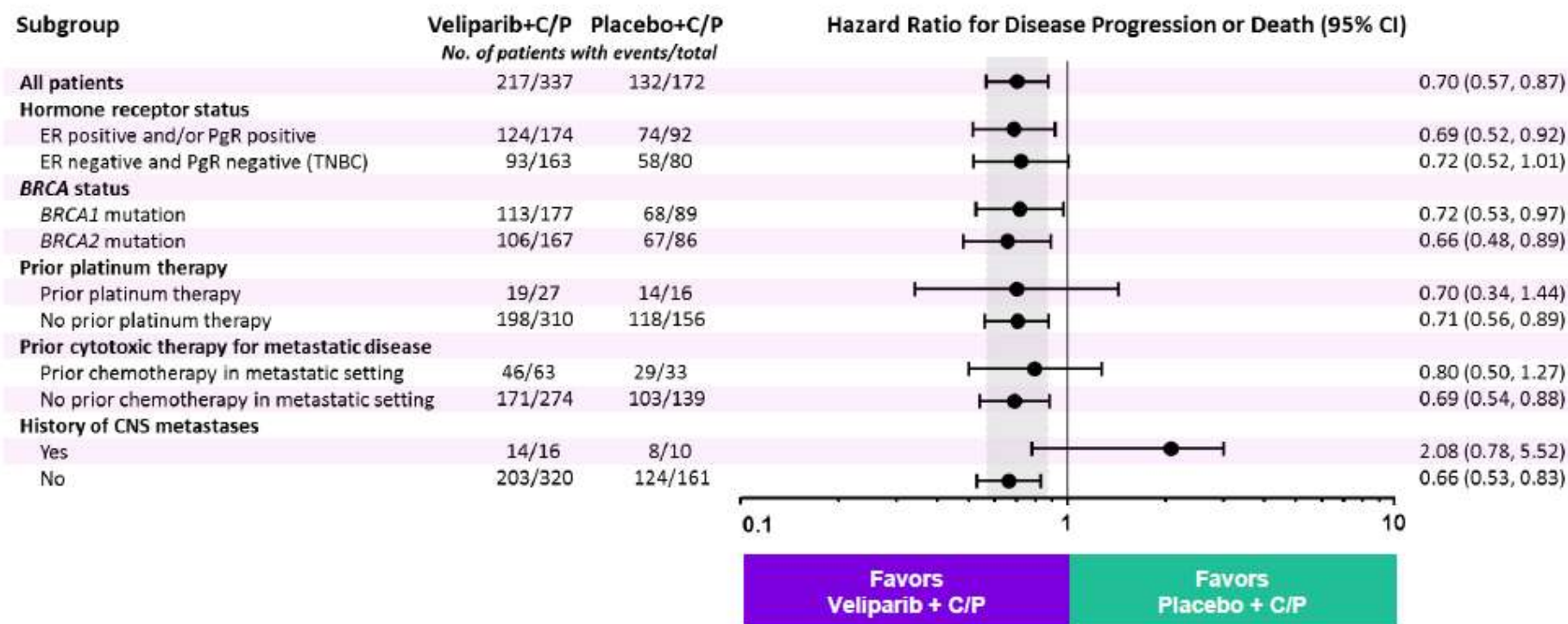
	No. at Risk																										
Control	172	160	153	140	123	99	82	64	47	39	35	27	23	18	15	15	12	8	8	8	6	5	5	4	3	0	
Veliparib	337	316	301	282	250	207	181	154	137	126	107	92	81	72	60	51	45	38	32	25	20	16	8	4	1	1	0

Primary Endpoint: PFS by Independent Central Review

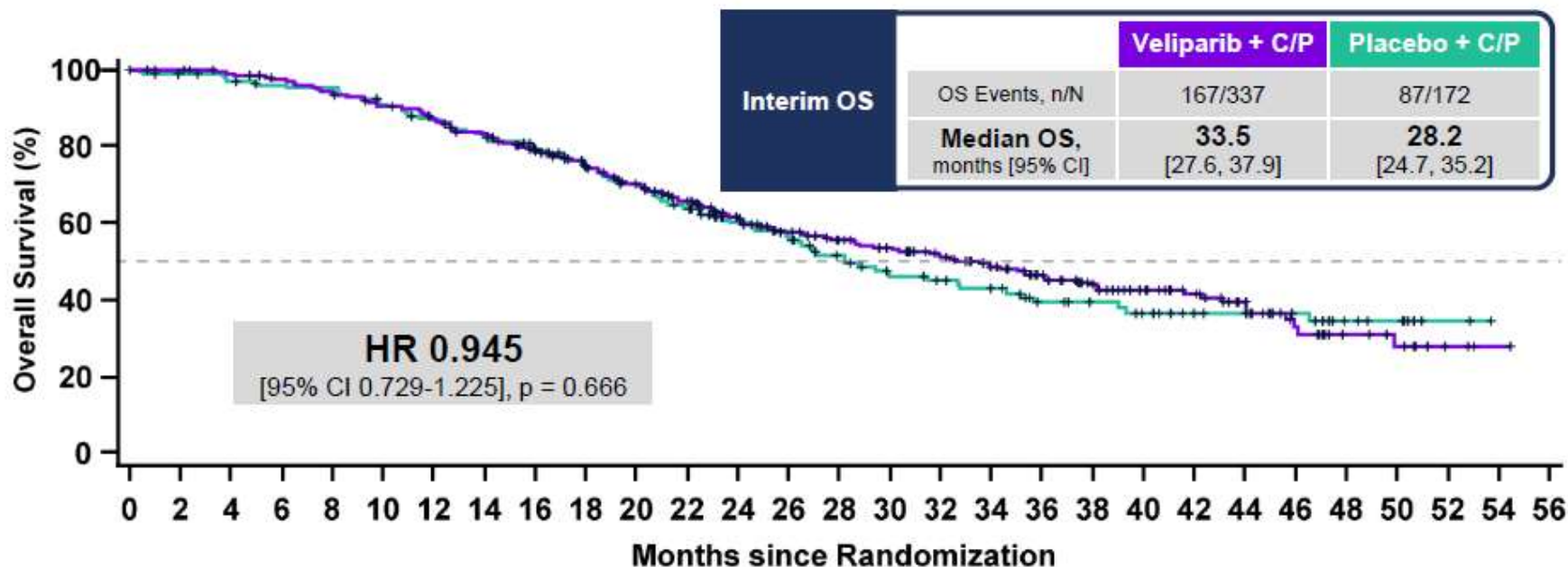


	No. at Risk																										
Control	172	159	149	137	120	93	75	53	43	33	30	23	20	16	14	14	11	9	8	8	7	5	5	4	3	0	
Veliparib	337	317	300	273	238	201	180	151	132	120	101	89	76	68	56	46	41	35	28	25	19	15	7	4	1	1	0

PFS Subgroup Analysis (Investigator-Assessed)



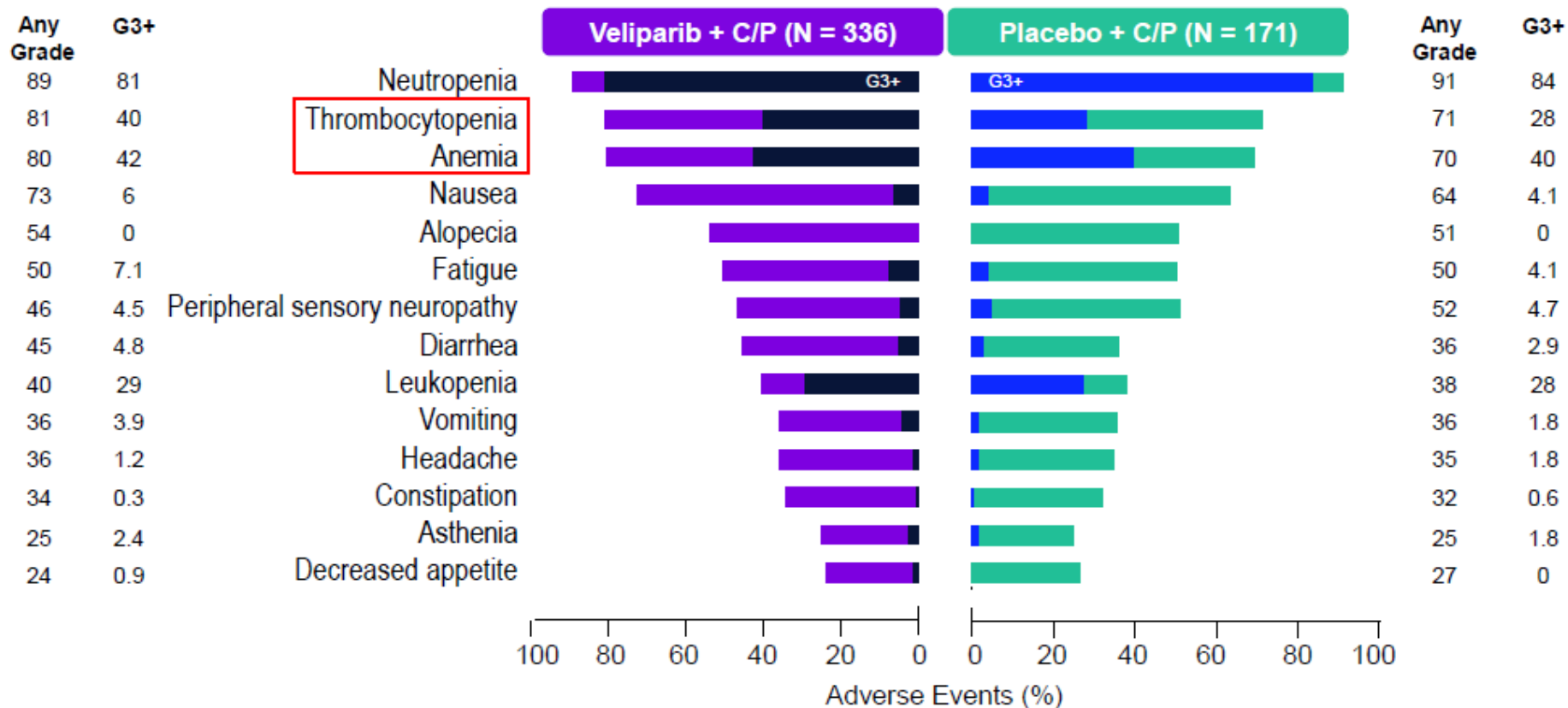
Secondary Endpoint: Overall Survival (Interim Analysis)



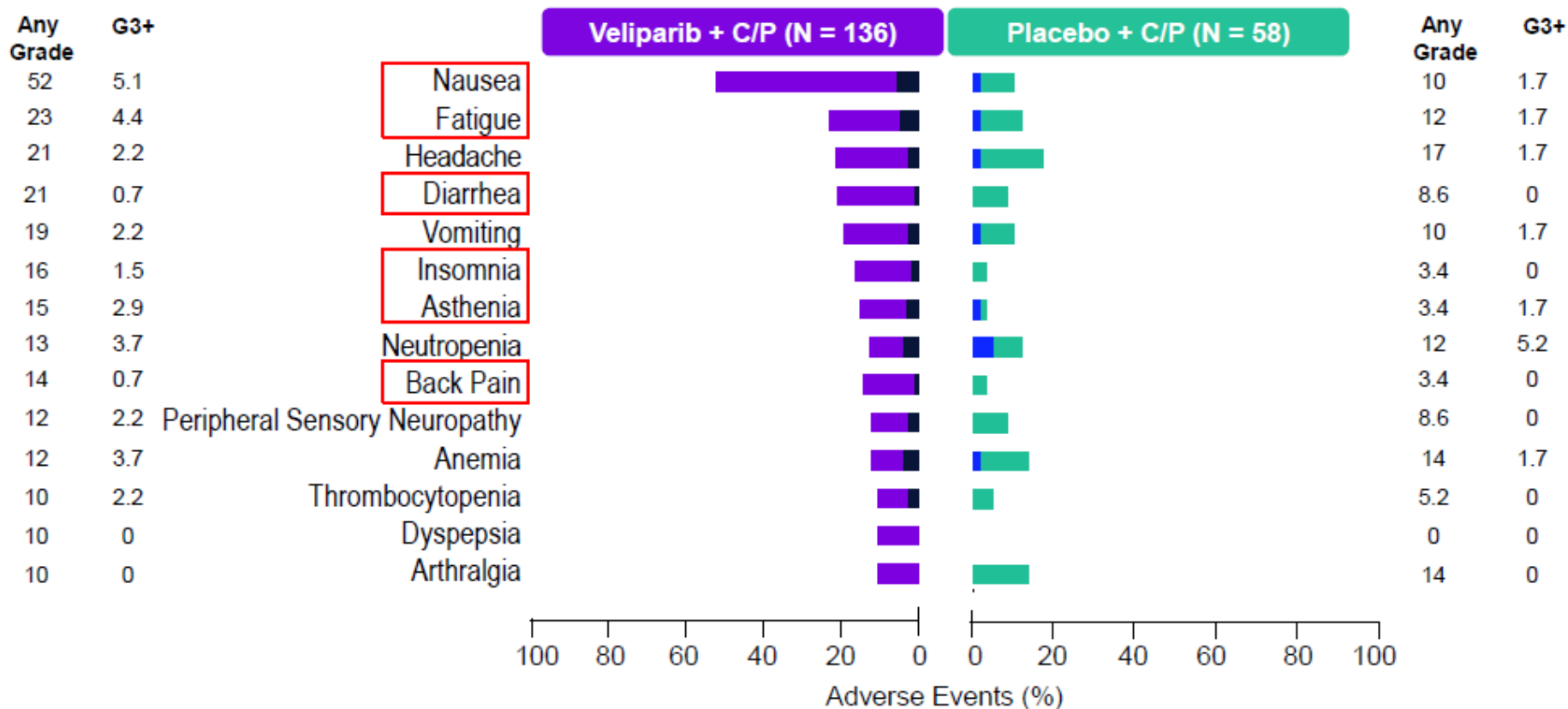
No. at Risk

	0	2	4	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40	42	44	46	48	50	52	54	56
Control	172	166	162	158	157	149	141	134	125	111	102	90	75	68	57	47	44	40	32	29	25	19	18	15	9	7	2	0	
Veliparib	337	332	326	318	307	294	281	265	247	223	203	185	161	145	132	117	106	90	76	62	50	41	30	18	11	8	3	1	0

Common Adverse Events (Entire Treatment Period)



Common Adverse Events (Blinded Monotherapy)



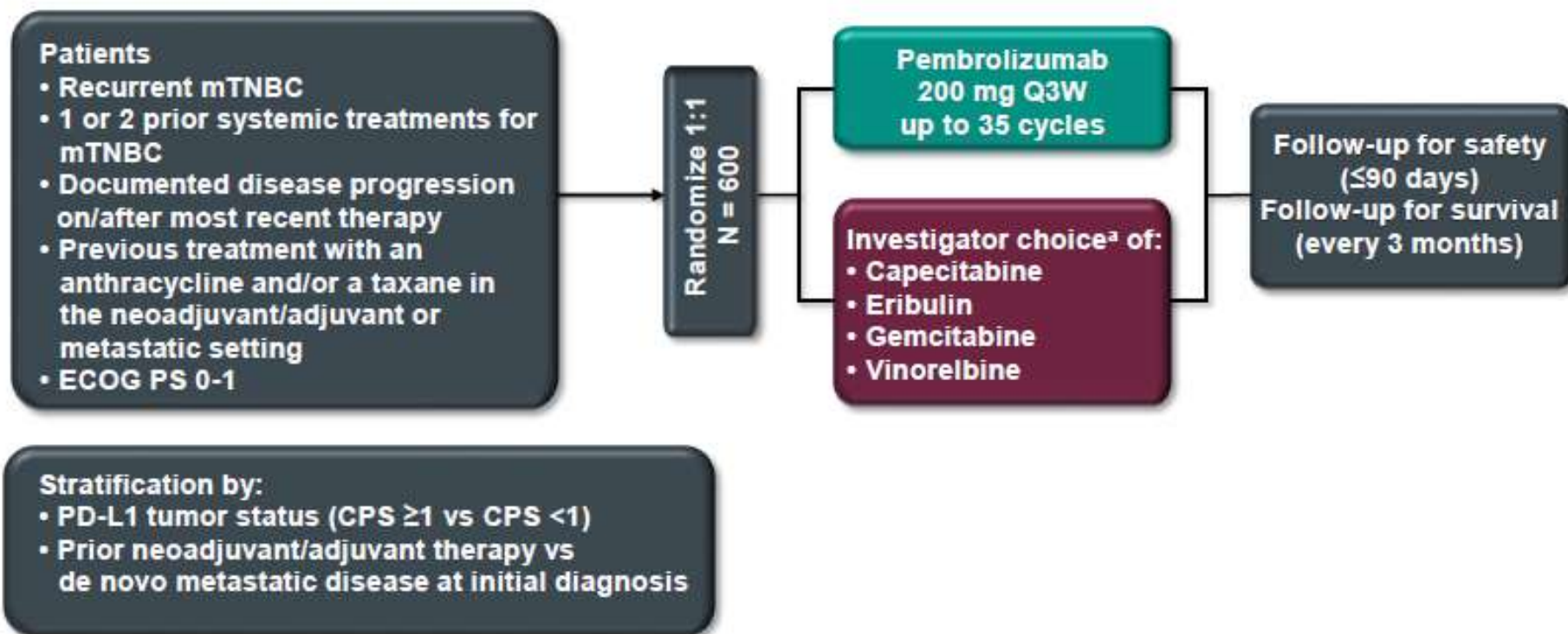
All-grade AEs in ≥10% of patients. Red boxes indicate differences ≥10% in any grade AEs between arms. G3+: Grade 3 or Higher. C/P: Carboplatin and Paclitaxel



OUTLINE

- ✓ **Monaleesa 3 & Monarch 2**
- ✓ **BROCADE 3**
- ✓ **Keynote-119**

KEYNOTE-119 Study Design (NCT02555657)



ECOG PS = Eastern Cooperative Oncology Group performance status; mTNBC = metastatic triple-negative breast cancer; PD-L1 = programmed death ligand 1; Q3W = every 3 weeks.
^aMaximum enrollment cap of 60% of total enrollment for each chemotherapy drug.

Baseline Characteristics

Characteristic, n (%)	Pembro N = 312	Chemo N = 310
Age, median (range), y	50 (28 – 85)	50 (25 – 79)
<65 years	264 (84.6)	260 (83.9)
Post-menopausal	238 (76.3)	239 (77.1)
ECOG PS		
0	169 (54.2)	158 (51.0)
1	141 (45.2)	151 (48.7)
No. prior lines		
1	187 (59.9)	187 (60.3)
2	124 (39.7)	123 (39.7)

Characteristic, n (%)	Pembro N = 312	Chemo N = 310
Prior neoadjuvant/adjuvant	246 (78.8)	246 (79.4)
Time to progression on 1L		
<6 mo	156 (50.0)	151 (48.7)
≥6 mo	156 (50.0)	159 (51.3)
Chemotherapy received		
Eribulin	-	167 (53.9)
Capecitabine	-	85 (27.4)
Vinorelbine	-	43 (13.9)
Gemcitabine	-	15 (4.8)

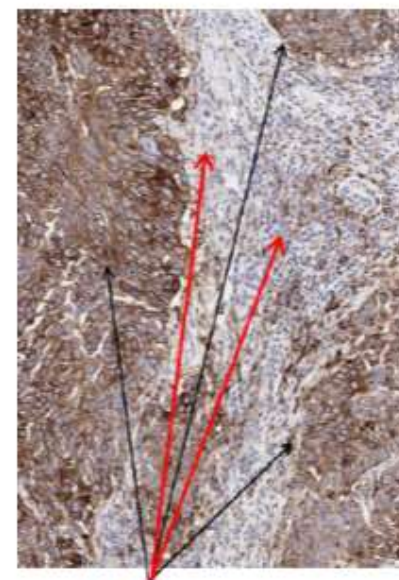


PD-L1 Expression Analysis

- Measure of PD-L1 expression: combined positive score (CPS)

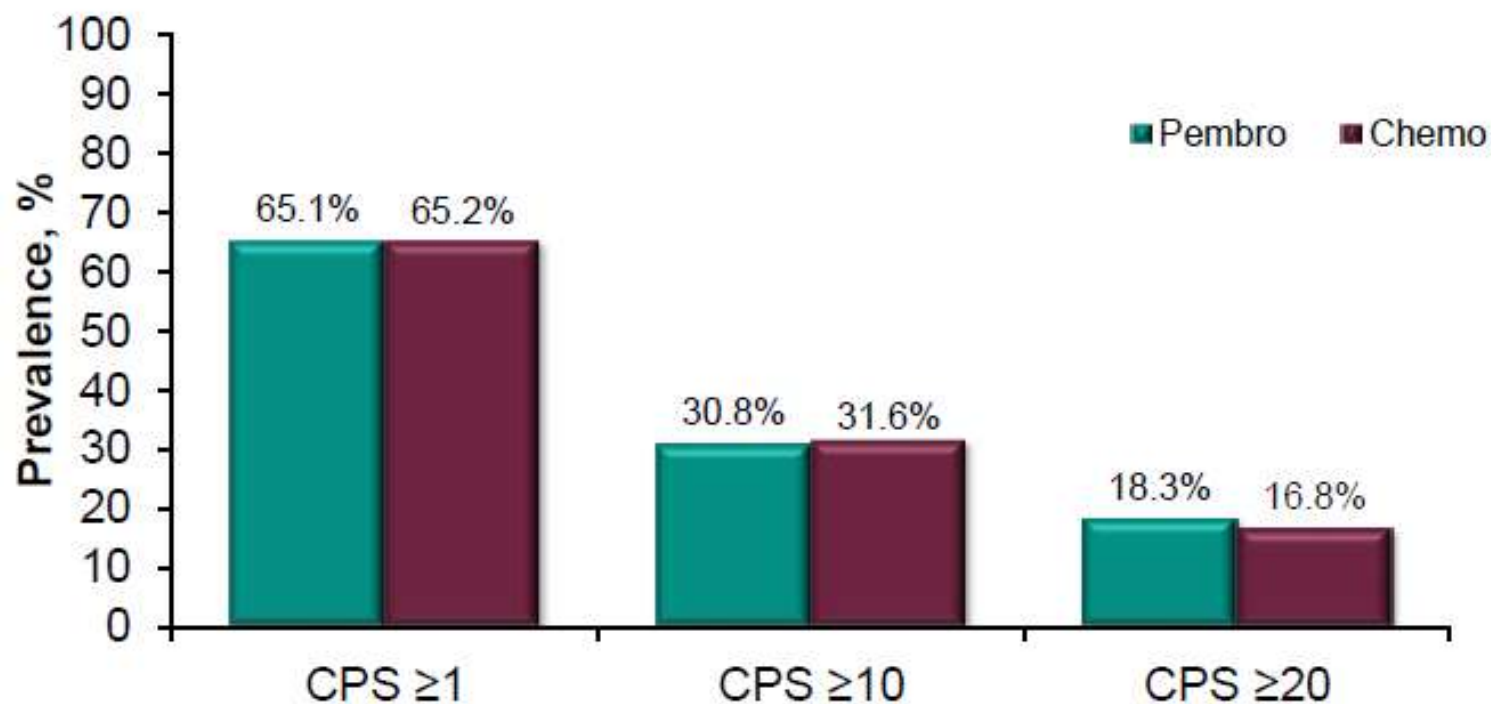
$$\text{CPS} = \frac{\text{\# PD-L1-staining cells (tumor cells, lymphocytes, macrophages)}}{\text{Total \# viable tumor cells}} \times 100$$

- Assessed centrally in newly obtained core or excisional biopsy from metastatic, not previously irradiated, tumor lesion using PD-L1 IHC 22C3 pharmDx (Agilent Technologies)
- Positive PD-L1 expression: CPS ≥ 10 and CPS ≥ 1



PD-L1 positive cells
(Tumor Cells, Immune Cells)

Prevalence of PD-L1 CPS Categories

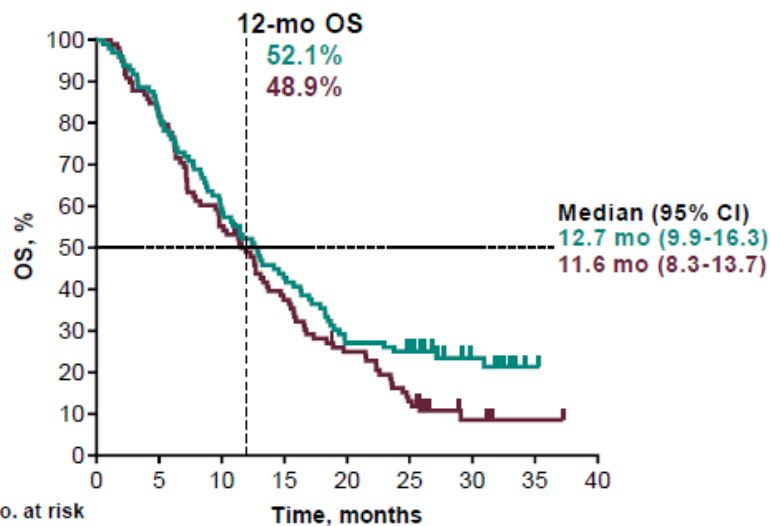


CPS = combined positive score defined as the number of PD-L1-positive cells (tumor cells, lymphocytes, macrophages) divided by total number of tumor cells × 100.
 Data cutoff date: April 11, 2019.

Overall Survival: Primary Endpoints

CPS ≥10

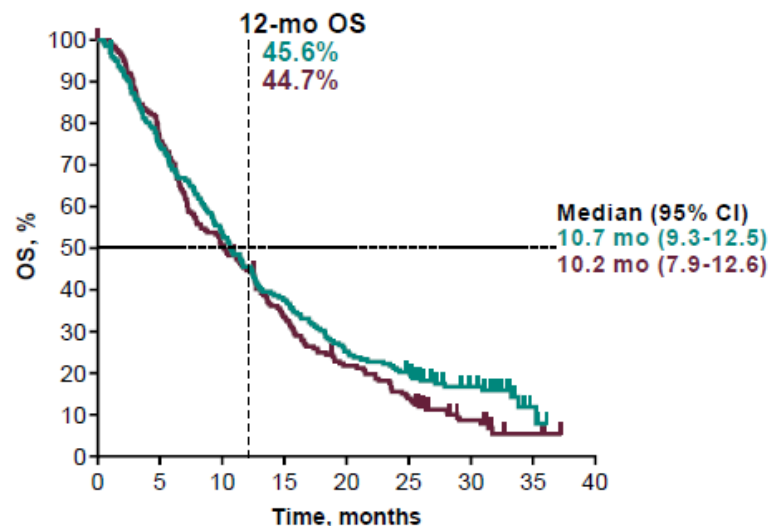
Events	HR (95% CI)	P
77.1%	0.78	0.057
88.8%	(0.57-1.06)	



No. at risk	Time, months	0	5	10	15	20	25	30	35	40
Pembro	96	79	57	41	26	23	11	1	0	
Chemo	98	80	54	36	23	12	4	1	0	

CPS ≥1

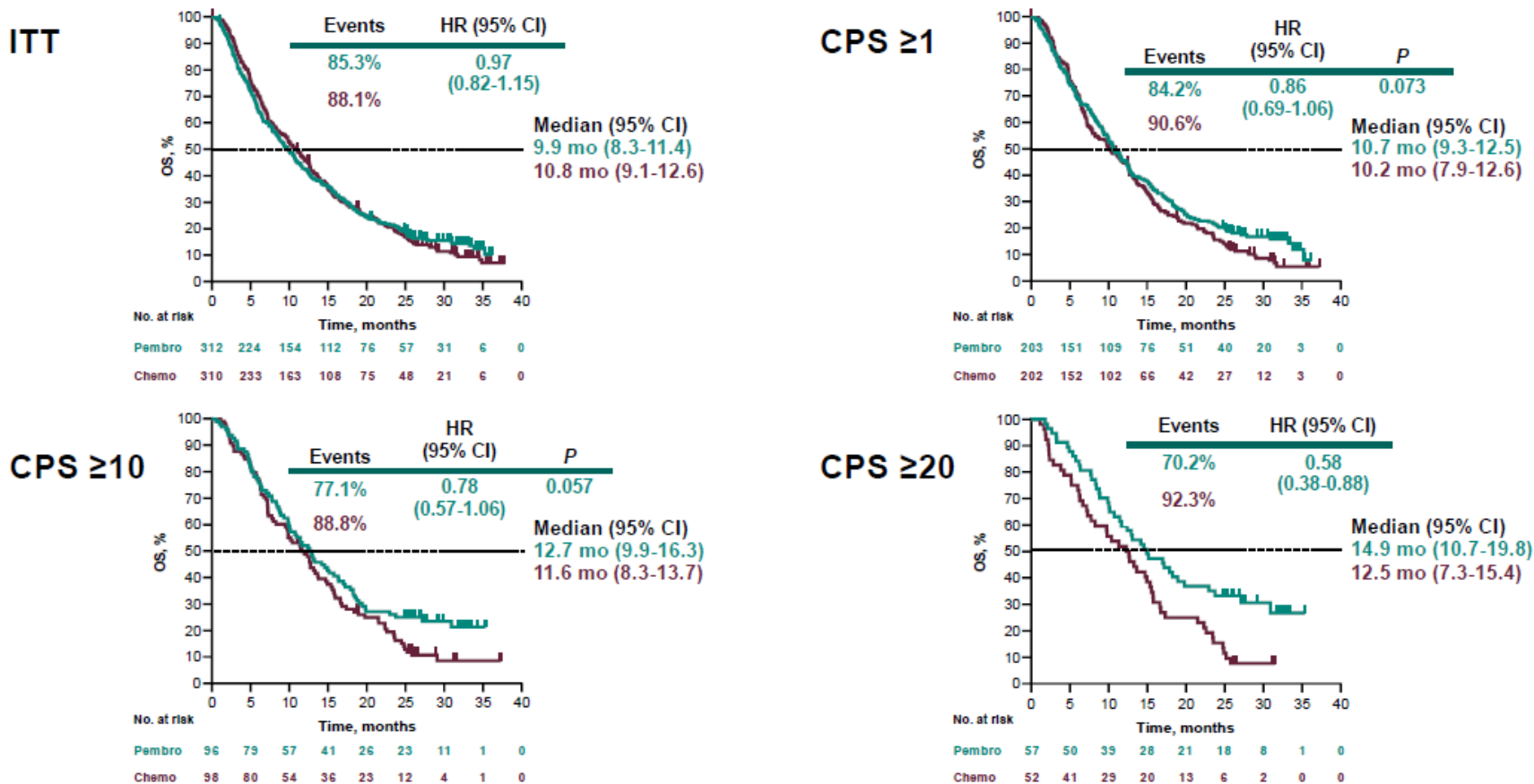
Events	HR (95% CI)	P
84.2%	0.86	0.073
90.6%	(0.69-1.06)	



Pembro	203	151	109	76	51	40	20	3	0
Chemo	202	152	102	66	42	27	12	3	0

Data cutoff date: April 11, 2019.

Overall Survival by PD-L1 CPS

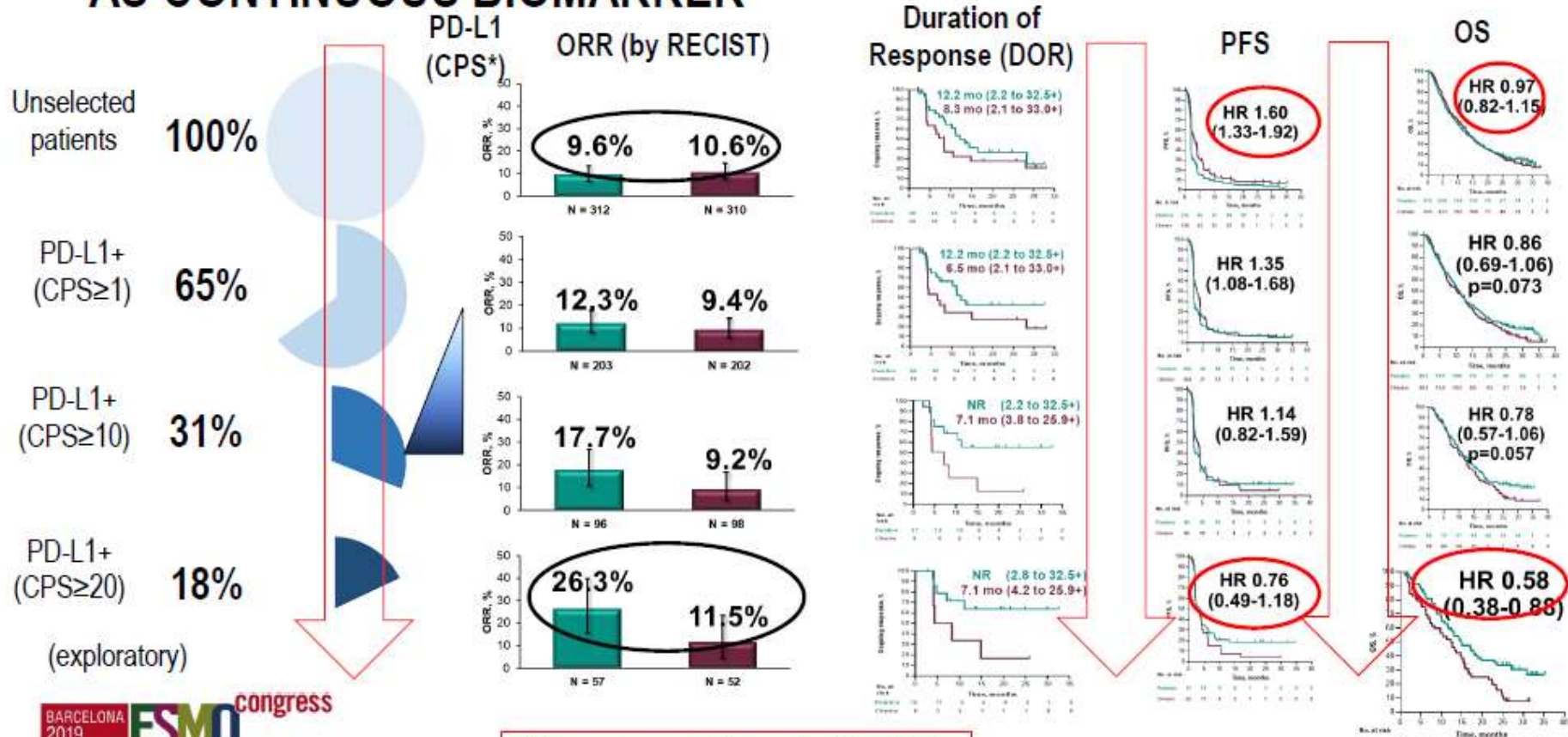


OS in the ITT, CPS ≥1 and CPS ≥10 populations were primary endpoints; OS in the CPS ≥20 population was an exploratory endpoint. Data cutoff date: April 11, 2019

Summary

- Pembrolizumab monotherapy as 2/3L treatment for mTNBC did not significantly improve OS vs chemotherapy in the primary analysis populations
- Pembrolizumab showed a clear trend in improved efficacy with PD-L1 enrichment
 - OS HR: 0.96, 0.86, 0.78, and 0.58 in ITT, CPS ≥ 1 , ≥ 10 , and ≥ 20 , respectively
 - PFS HR: 1.60, 1.35, 1.14, and 0.76, respectively
 - ORR: 9.6% vs 10.6%, 12.3% vs 9.4%, 17.7% vs 9.2%, and 26.3% vs 11.5%, respectively
- Responses to pembrolizumab were more durable than those to chemotherapy
- Pembrolizumab monotherapy was generally well tolerated
 - Lower incidence vs chemotherapy of any-grade and grade 3-5 AEs
 - Lower incidence vs chemotherapy of AEs leading to discontinuation and dose modification
 - Safety profiles as expected for pembrolizumab and chemotherapy

A CLOSER LOOK INTO KEYNOTE-119: PD-L1 (CPS*, USING 22C3) AS CONTINUOUS BIOMARKER



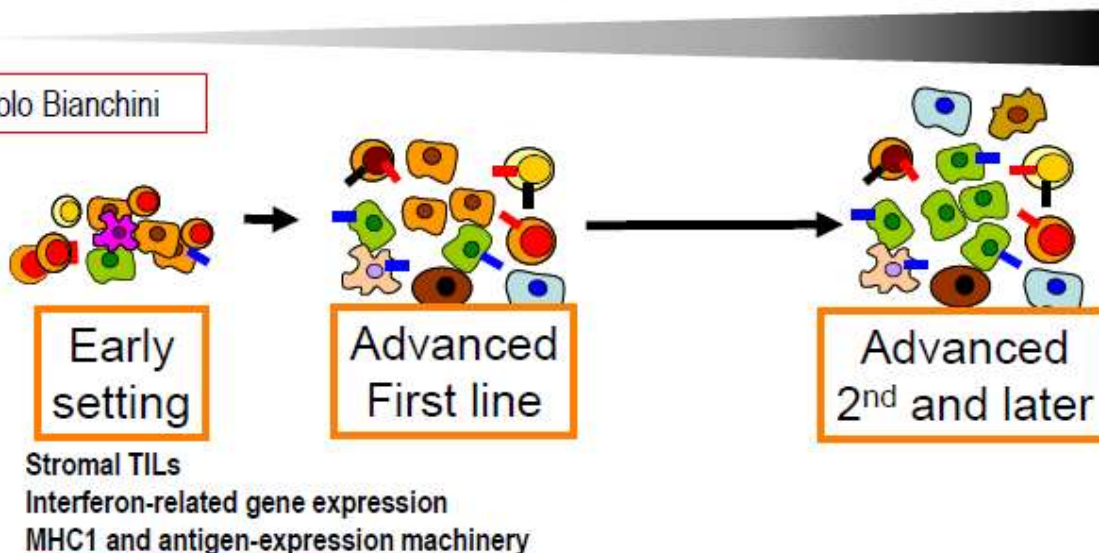
Slide courtesy of Giampaolo Bianchini

SHOULD WE GIVE IMMUNE CHECKPOINTS INHIBITORS IN FIRST LINE OR SUBSEQUENT LINES OF TREATMENT? **YES!**

Tumor/immune co-evolution leads to an increasing immuno-editing and immune subversion

Immune escape

Slide courtesy of Giampaolo Bianchini



OUTLINE

✓ **Monaleesa 3 & Monarch 2**



✓ **BROCADE 3**



✓ **Keynote-119**





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Thanks

