

Moderatore: M. Di Ianni (Pescara)

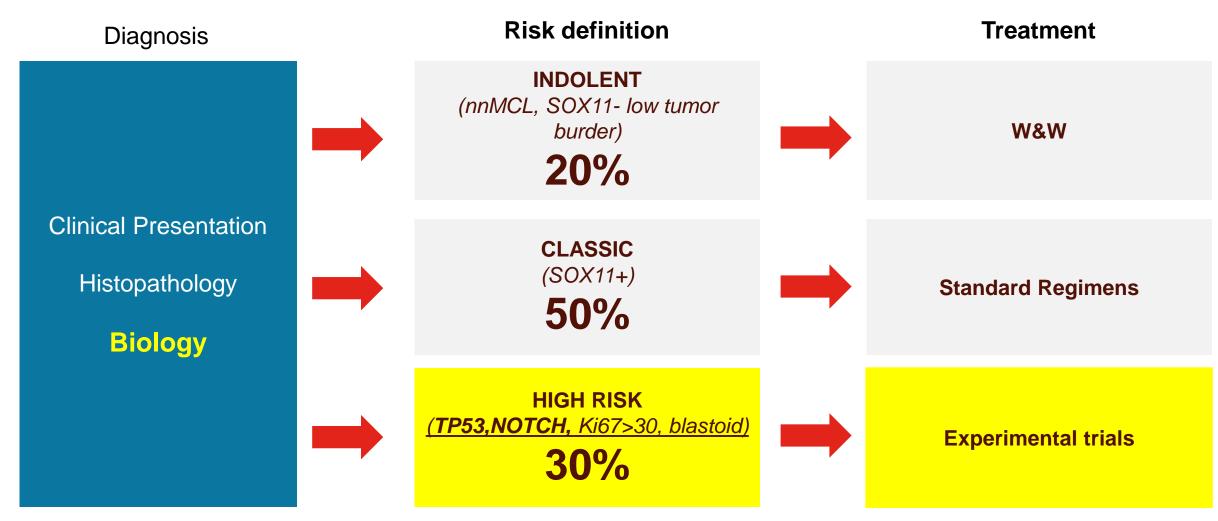
Algoritmo di trattamento nel linfoma mantellare

Maurizio Martelli
Ematologia
Università Sapienza/ Policlinico Umberto1 Roma

### **Maurizio Martelli**

Company name	Research support	Employee	Consultant	Stockholder	Speakers bureau	Advisory board	Other
Roche					Х	Х	
Gilead					X	X	
Novartis					X	X	
Takeda					X	X	
Abbvie					X	X	
Incyte	X				X	X	
Janssen					X	X	
BMS					X	X	
Beigene					X	X	
Eli Lilly					X	X	

# New therapeutic approach in MCL



# High risk features distribution

	Young (MCL-0208)	Nordic (MCL2-3)	Elderly (VR-BAC)
All patients	190	183	140
Ki67>30%	50 (28%)	68 (43%)	34 (24%)
TP53 mut	15 (8%)	20 (11%)	28 (20%)
TP53 del	25 (13%)	29 (16%)	19 (14%)
TP53 mut/del	31 (17%)	37 (20%)	34 (24%)
Blastoid	16 (8%)	31 (17%)	13 (9%)

# **Agenda**

- First line therapy of younger / fit patients ( is changing)
- First line therapy of elderly/ unfit patients
- Treatment in first relapse
- Treatment after BTKi failure

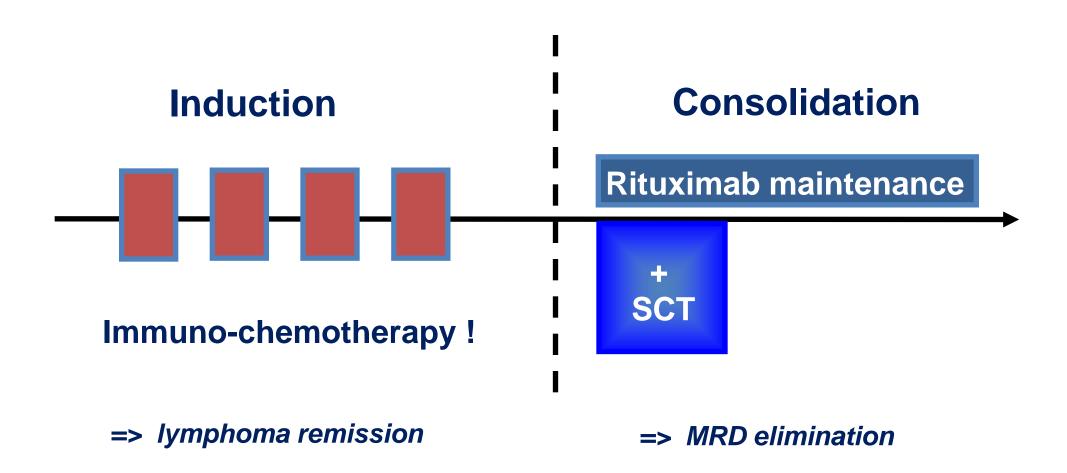


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## **Current Treatment in Mantle Cell Lymphoma**



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Preferred First-line Treatment Options **Aggressive Chemotherapy** 

R-DHAP (cisplatin, or oxaliplatin)
R-CHOP/R-DHAP (alternating)
NORDIC (maxi-CHOP/R + HD cytarabine)



**Consolidation and Maintenance** 

HDT + ASCT → R maint for 3 yr

Preferred
Second-line
Treatment
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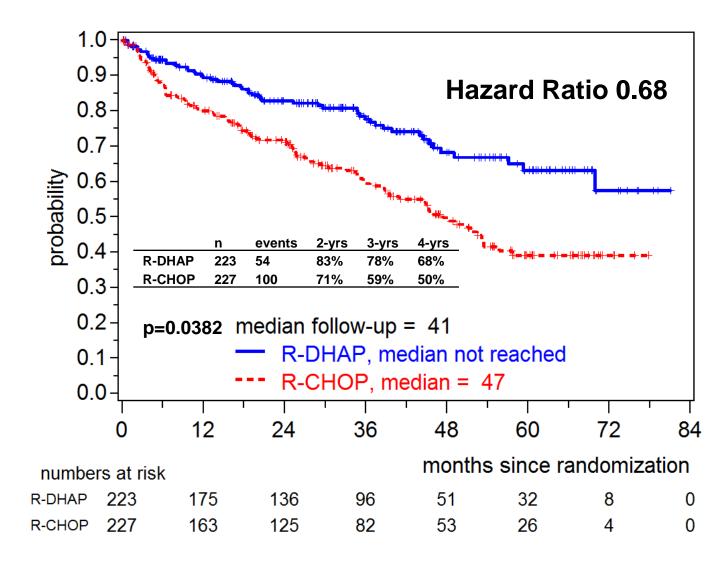
**Third-line Treatment** 

### **Intensive schemes including ASCT**

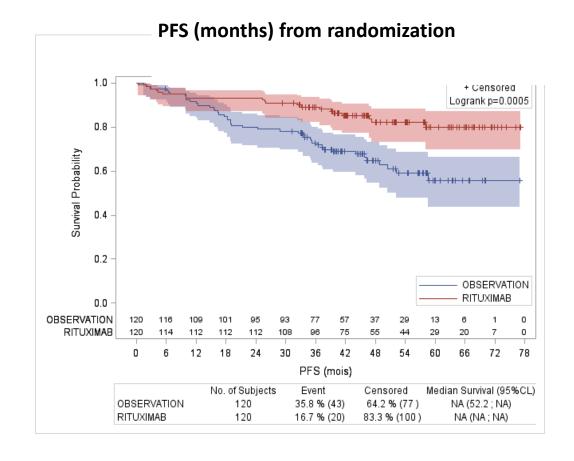
### MCL Network younger Trial



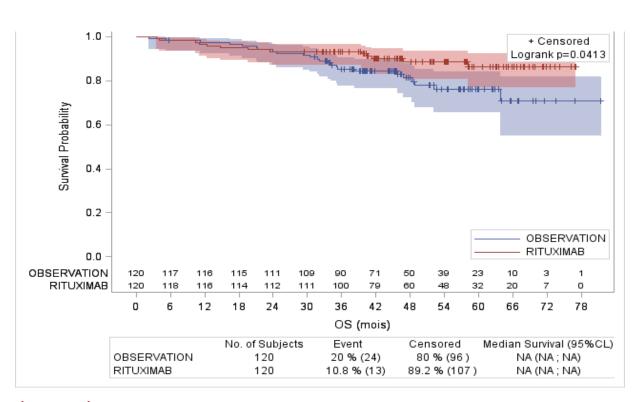




## LyMa trial: survival from randomization



#### OS (months) from randomization



mFU: 50.2m (46.4-54.2)

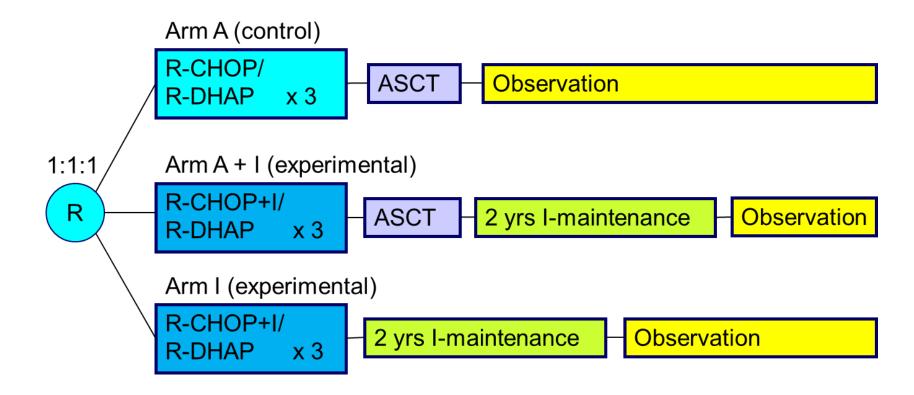
PFS		OS	
<b>Obs</b> (95%CI) <b>vs</b>	Rituximab (95%CI)	<b>Obs</b> (95%CI) <b>vs</b>	Rituximab (95%CI)
<b>24m: 79.8 %</b> (71.5-86.0)	<b>93.3 %</b> (87.1-96.6)	<b>24m: 93.3 %</b> (87.0-96.6)	<b>93.3</b> % (87.1-96.6)
<b>36m: 72.8 %</b> (63.7-79.9)	<b>89.1</b> % (82.0-93.5)	<b>36m: 85.4 %</b> (77.5-90.7)	<b>93.3</b> % (87.1-96.6)
<b>48m: 64.6</b> % (54.6-73.0)	<b>82.2</b> % (73.2-88.4)	<b>48m: 81.4 %</b> (72.3-87.7)	<b>88.7</b> % (80.7-93.5)



# TRIANGLE: Trial Design



- MCL patients
- previously untreated
- stage II-IV
- younger than 66 years
- suitable for HA and ASCT
- ECOG 0-2
- Primary outcome: FFS
- Secondary outcomes:
  - Response rates
  - PFS, RD
  - OS
  - Safety

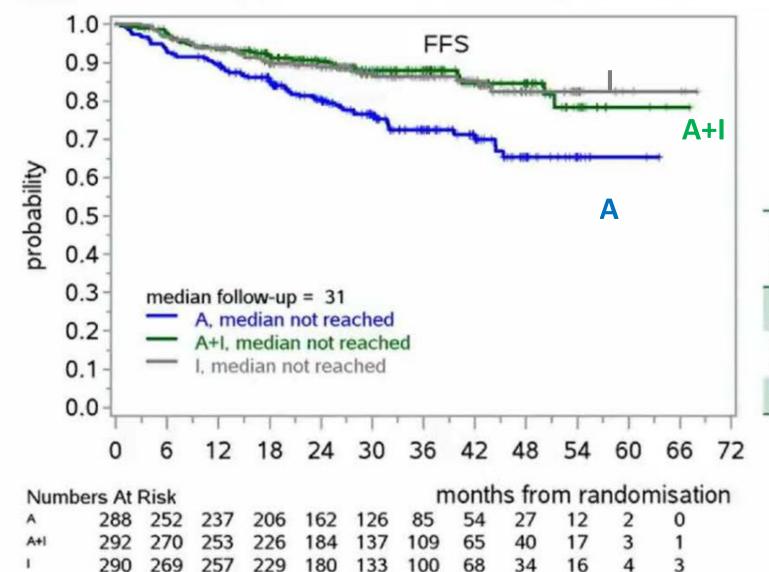


- R maintenance was added following national guidelines in all 3 trial arms
- Rituximab maintenance (without or with Ibrutinib) was started in 168 (58 %)/165 (57 %)/158 (54 %) of A/A+I/I randomized patients.



## TRIANGLE: FFS Superiority of A+I vs. I?





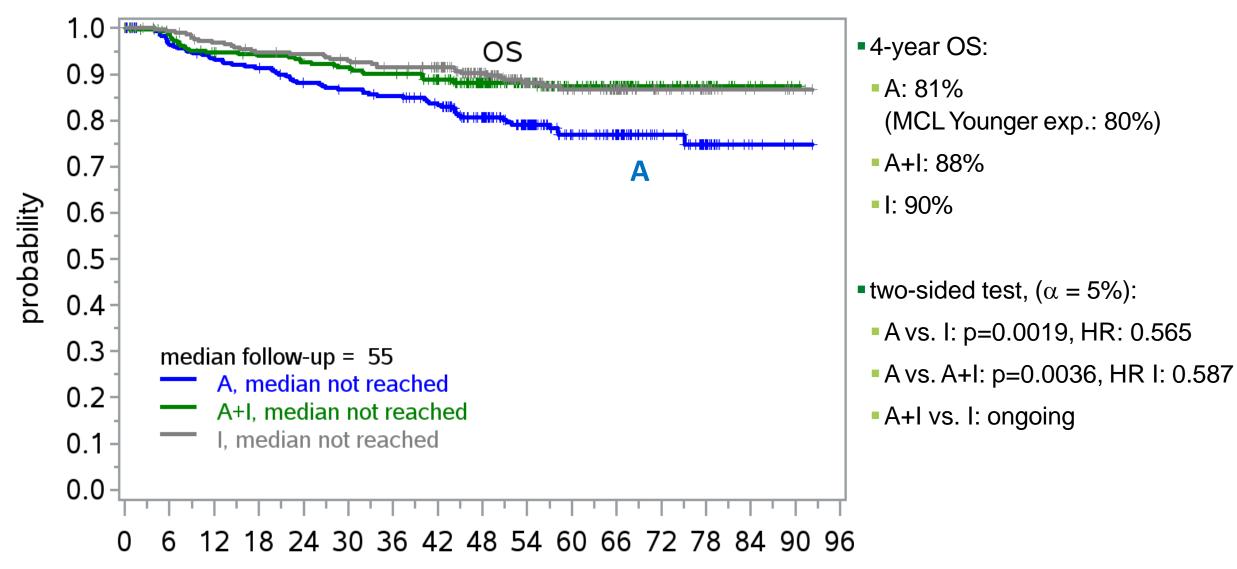
 Test A+I vs. I ongoing, no decision yet

Next lymphoma treatment (among patients with first treatment failure)	A (n=68)		A+I (n=35)		I (n=37)	
Treatment with Ibrutinib	34	79%	4	24%	3	11%
Treatment without Ibrutinib	9	21%	13	76%	24	89%
No treatment	25		18		10	



### **TRIANGLE:** Overall survival

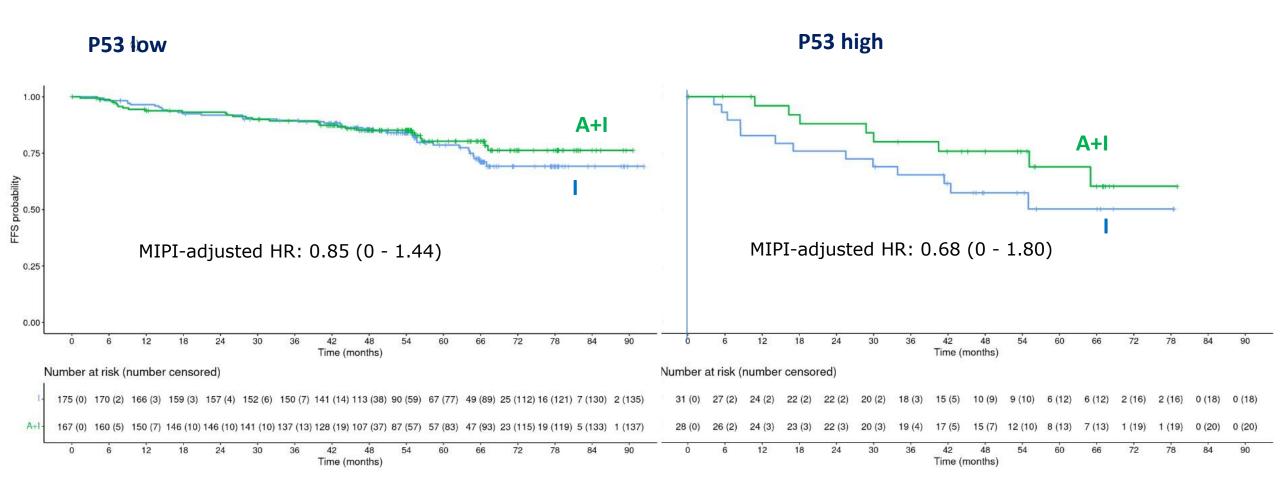






## TRIANGLE: A+I vs. I (FFS) and p53 high expression

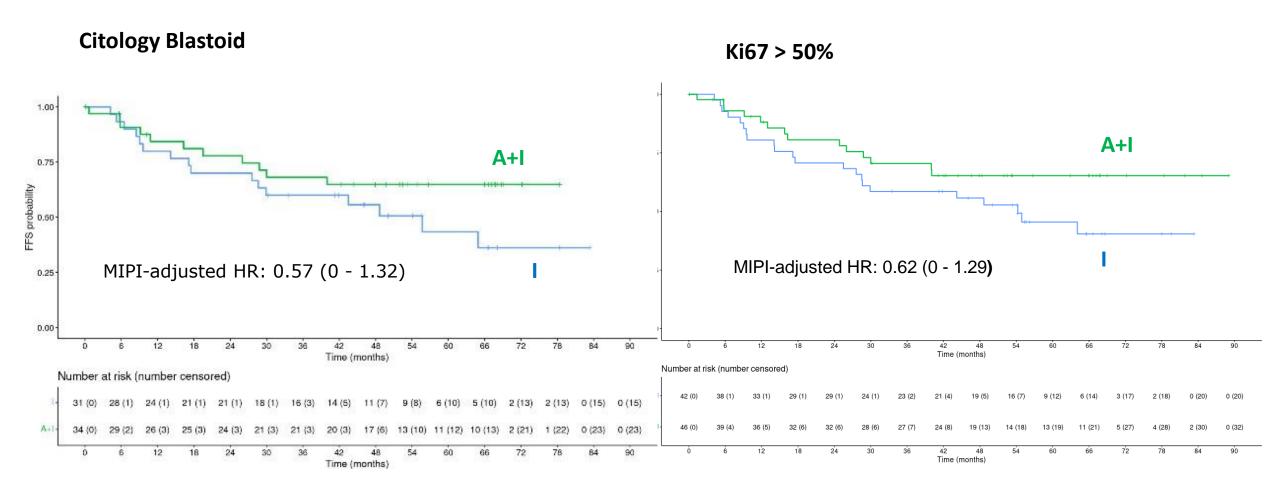






# TRIANGLE: A+I vs. I (FFS) Ki-67 (50% cut-off) and citology blastoid





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### **Current Treatment in Mantle Cell Lymphoma**



Preferred First-line Treatment Options

#### **Aggressive Chemotherapy**

R-DHAP (cisplatin, or oxaliplatin)
R-CHOP/R-DHAP (alternating)
NORDIC (maxi-CHOP/R + HD cytarabine)



**Consolidation and Maintenance** 

 $HDT + ASCT \rightarrow R$  maint for 3 yr

#### **Less Aggressive Chemotherapy**

BR R-CHOP RBAC



**Maintenance** 

After R-CHOP: R maint until Progression.

Preferred
Second-line
Treatment
Options

#### **BTK** inhibitor

Ibrutinib

Third-line Treatment

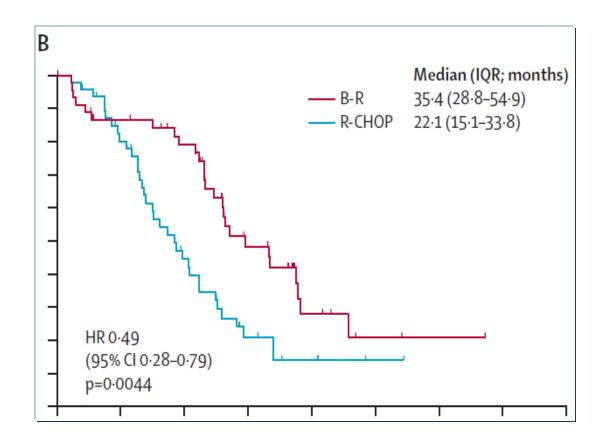
Brexucabtagene autoleucel (after chemoimmunotherapy and BTK inhibitor)

**Pirtobrutinib** 

## Elderly MCL: Bendamustine-Rituximab (B-R) vs. R- CHOP



#### **Stil NHL 1-2003**



	B-R (n=261)	R-CHOP (n=253)	pvalue
Alopecia	0	245 (100%)*	<0.0001
Paresthesia	18 (7%)	73 (29%)	<0.0001
Stomatitis	16 (6%)	47 (19%)	<0.0001
Skin (erythema)	42 (16%)	23 (9%)	0.024
Skin (allergic reaction)	40 (15%)	15 (6%)	0.0006
Infectious episodes	96 (37%)	127 (50%)	0.0025
Sepsis	1 (<1%)	8 (3%)	0.019

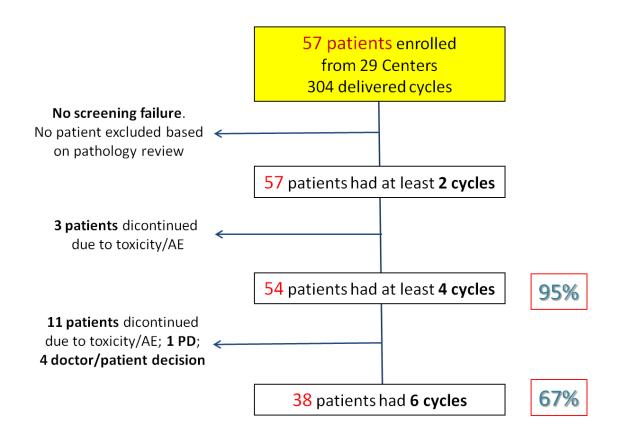
#### FIL R-BAC 500 trial



#### ✓ Patients' characteristics at inclusion

	Overall (57)	%
Age, years median (range)	71 (61-79)	
Gender male	43	75
Performance Status 0-1	54	94
AAS III-IV	52	91
MIPI risk category low intermediate high	9 23 25	16 40 44
BM involvement	36	63
Histology classical pleomorphic blastoid	43 8 6	75 14 11
Ki-67 (%) ≥30% median (range)	16 20 (5-85)	31

#### **✓** Trial profile



# Rituximab Plus Bendamustine and Cytarabine (R-BAC) in Elderly Patients with Newly Diagnosed Mantle Cell Lymphoma: Long Term Follow-up and Mrd Results of a Phase 2

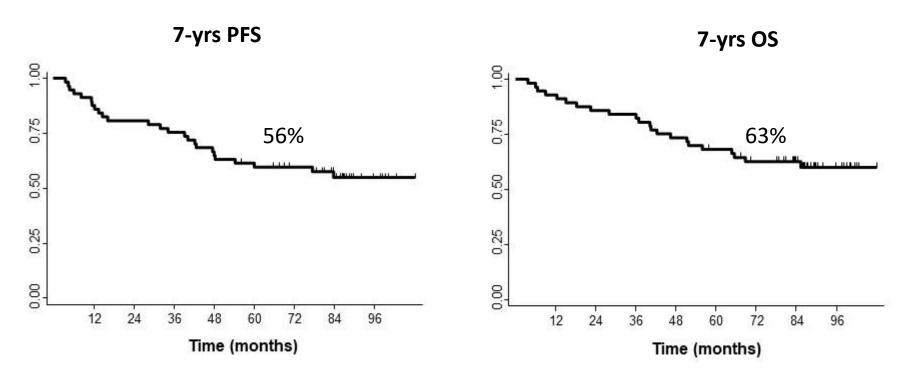




FIL-RBAC500

LINFOMI

- Study from the **Fondazione Italiana Linfomi**
- 7 years of median follow-up (86 months, range 57-107),
- median OS and PFS for all patients were not reached

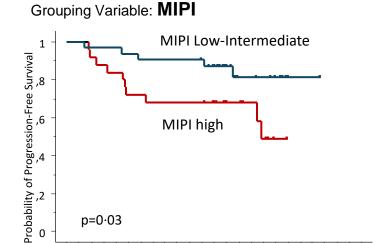


• Adverse predictive factors affecting PFS were blastoid morphology (p<0.05), elevated Ki67  $\geq$  30% (p<0.05), and failure to achieve CR after 2 cycles (p=0.03).

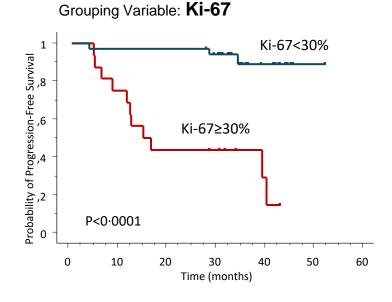
## FIL R-BAC 500 trial Univariate analysis for PFS

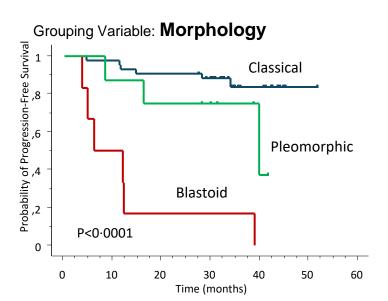


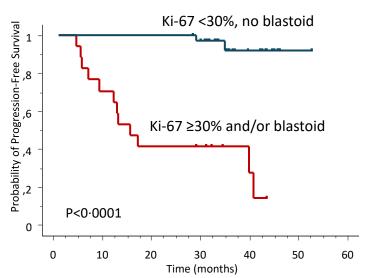




Time (months)



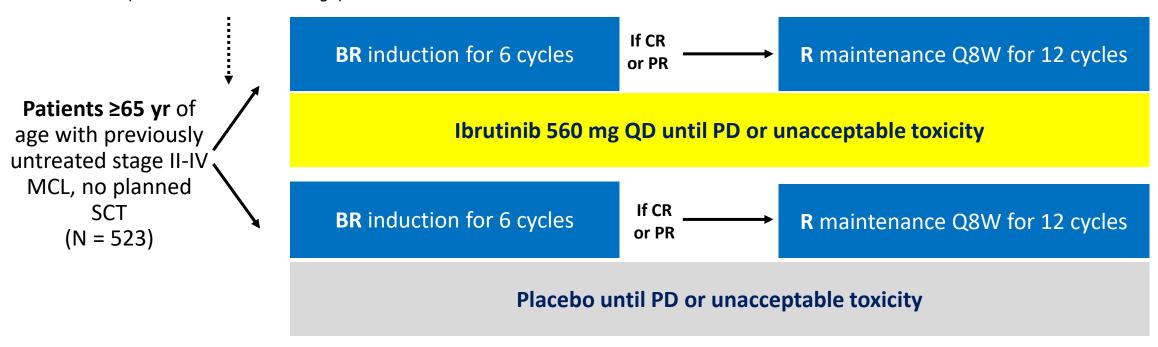




## SHINE: A Randomized, Double-Blind, Phase 3 Study

Multicenter, randomized, double-blind, placebo-controlled phase III trial

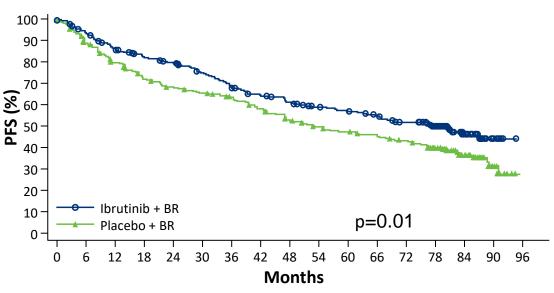
Stratification by: MIPI score (low vs intermediate vs high)



- Primary endpoint: investigator-assessed PFS (in ITT)
- Key secondary endpoints: ORR, time to next treatment, OS, safety

## SHINE: A Randomized, Double-Blind, Phase 3 Study

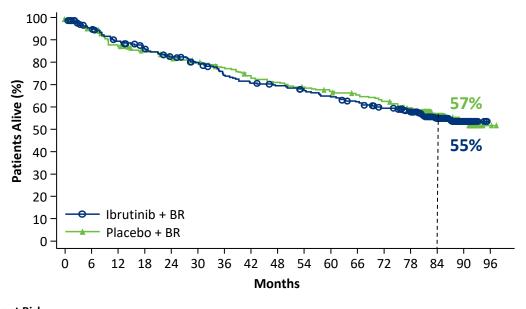
#### Median PFS 6.7 vs 4.4 years



 Patients at Risk

 Ibrutinib + BR
 261
 228
 207
 191
 182
 167
 152
 139
 130
 120
 115
 106
 95
 78
 39
 11
 0

 Placebo + BR
 262
 226
 199
 177
 166
 158
 148
 135
 119
 109
 103
 98
 90
 78
 41
 11
 0

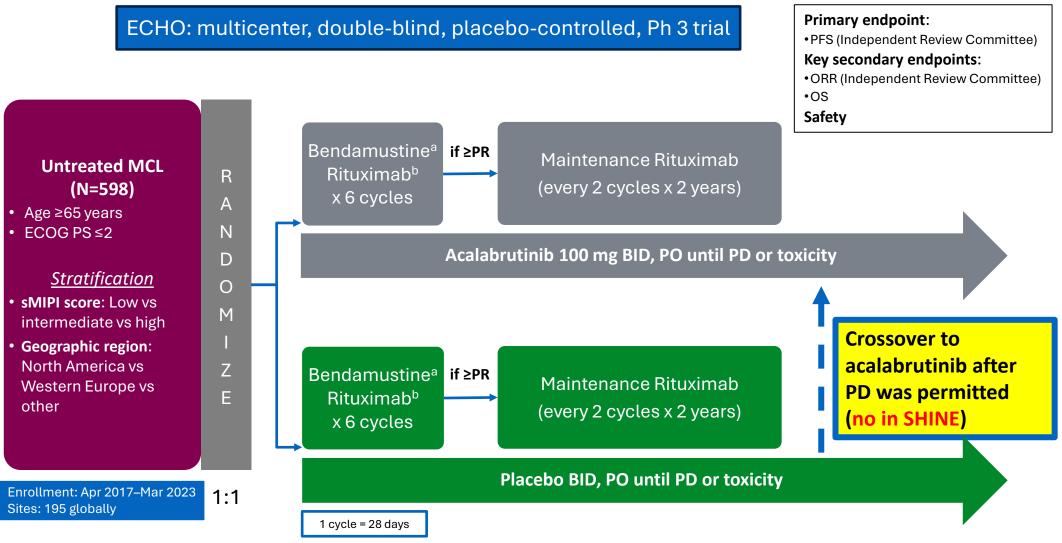


 Patients at Risk

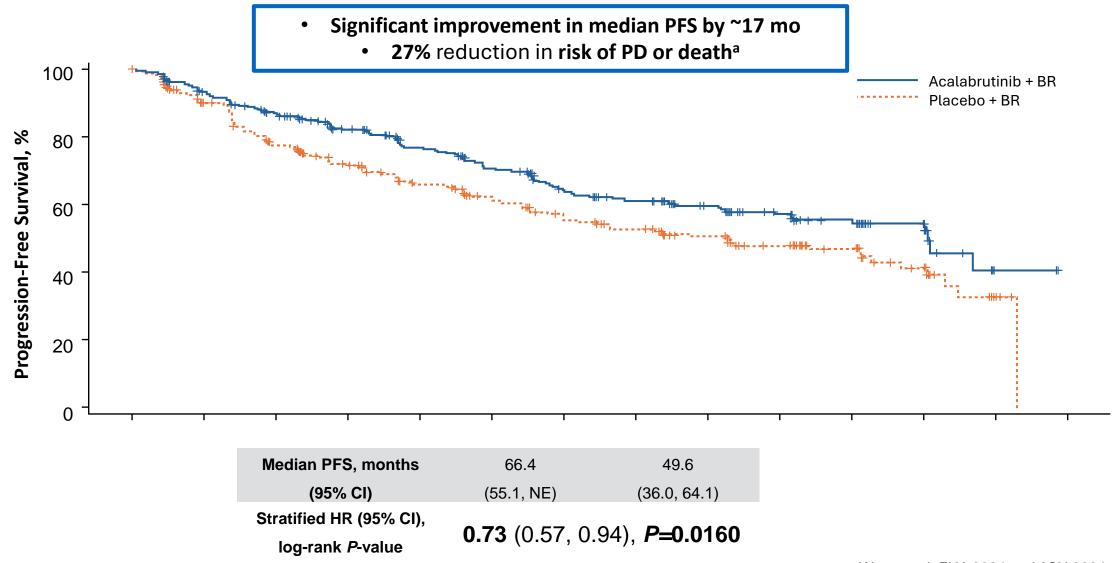
 Ibrutinib + BR
 261
 239
 221
 208
 197
 187
 171
 163
 158
 152
 145
 138
 128
 118
 70
 25
 0

 Placebo + BR
 262
 244
 223
 212
 203
 197
 188
 177
 171
 165
 159
 154
 147
 137
 90
 31
 2

# ECHO Phase III trial: statistically significant improvement in progression-free survival in 1st-line elderly MCL

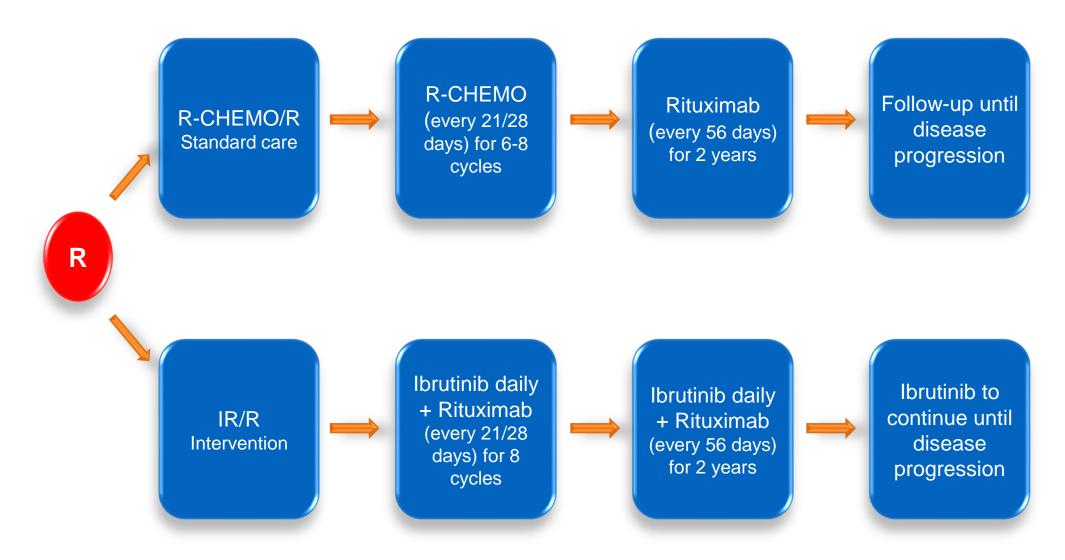


# PFS (primary endpoint) Was Significantly Improved With Acalabrutinib + BR



# Elderly mantle cell lymphoma ENRICH – NCRI multicentre Randomised open label phase II/III trial

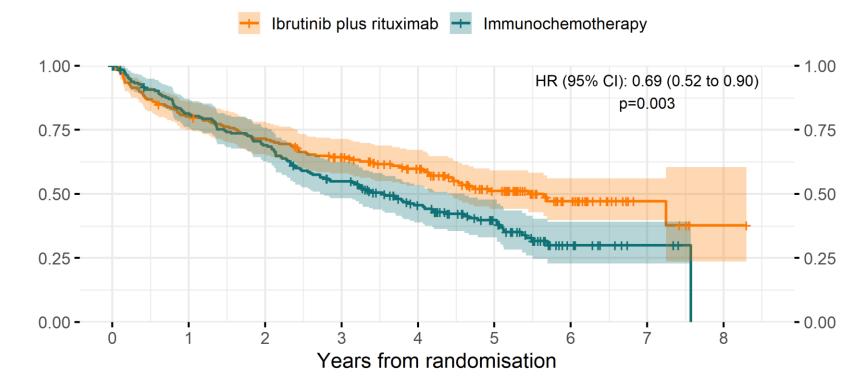




## **Progression-free survival**







#### Number at risk (number censored)

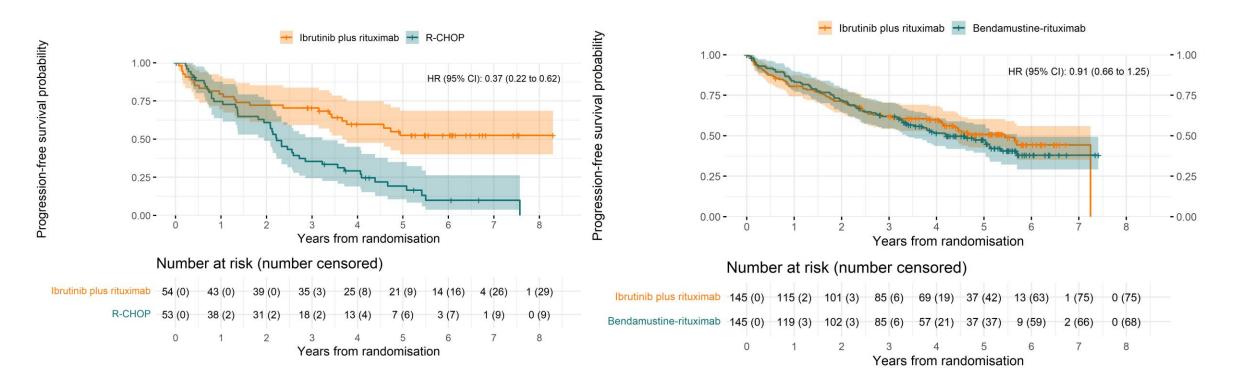


PFS median (95% CI)

**IR**: 65.3 mo (52.7 to not evaluable) **R-chemo**: 42.4 mo (32.7 to 55.3)

### PFS for R-CHOP and BR choice





5-year PFS (95% CI)

**IR**: 52.4% (40.0% to 68.6%)

**R-CHOP**: 19.2% (10.6% to 35.1%)

5-year PFS (95% CI)

**IR**: 50.8% (42.8% to 60.4%)

**BR**: 47.4% (39.5% to 56.9%)

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**Consolidation and Maintenance** 

 $HDT + ASCT \rightarrow R$  maint for 3 yr

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#### **Maintenance**

After R-CHOP: R maint until Progression.

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#### **BTK** inhibitor

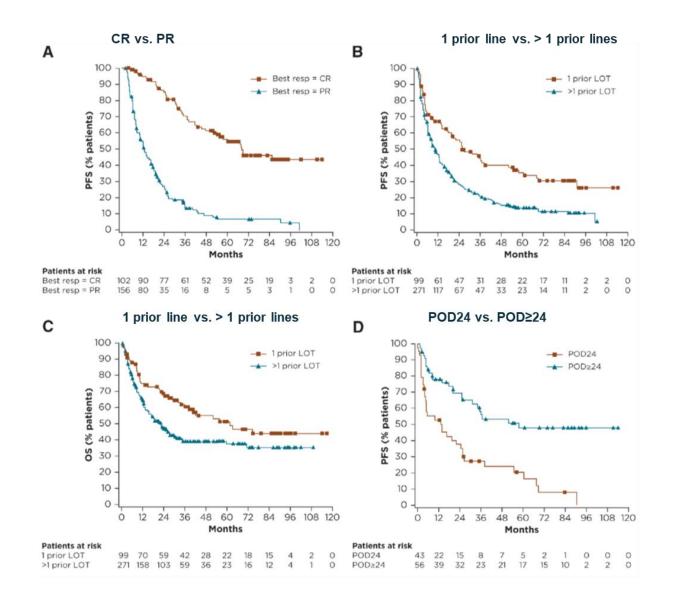
Ibrutinib

Third-line Treatment

Brexucabtagene autoleucel (after chemoimmunotherapy and BTK inhibitor)

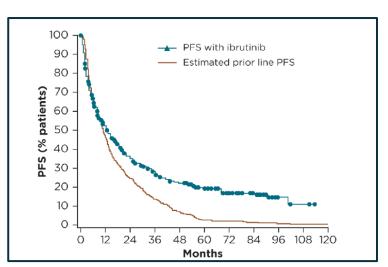
**Pirtobrutinib** 

## Ibrutinib in RR-MCL: PFS and OS by status after first line of therapy



- Pooled analysis of ibrutinib treatment in R/R MCL (3 trials;
   370 pts) @ FU of ~10 years [PCYC-1104, SPARK, RAY]
- Single-agent ibrutinib mitigates the historical trend of successive decline in PFS with each line of CIT regardless of age and prior LOT
- Patients achieving PFS > prior regimen:
  - low-risk sMIPI
  - non-bulky disease
  - non-blastoid histology
  - wild-type TP53



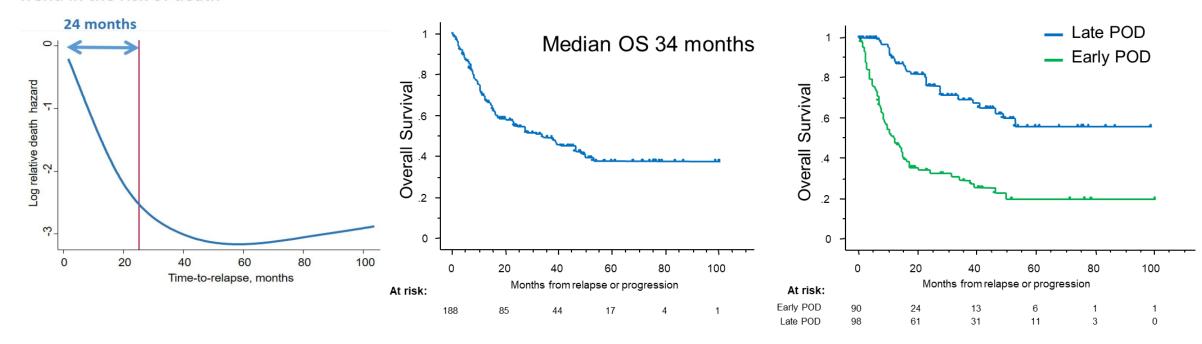


# Time to progression of MCL after HDAC-based regimens defines patients at high risk



#### **Early POD definition**

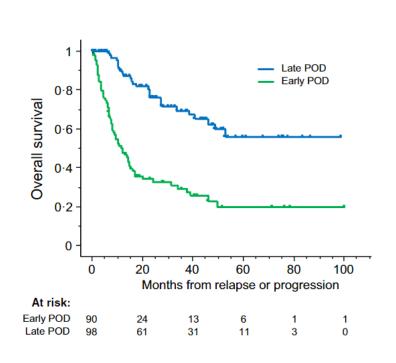
Trend in the risk of death\*

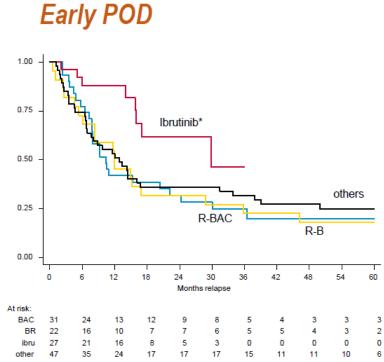


POD within 2 years of diagnosis identifies a population of patients who have remarkably poor outcomes

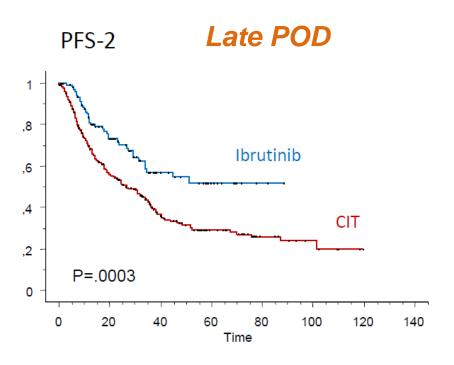
## Standard of care for first relapse: Time to POD







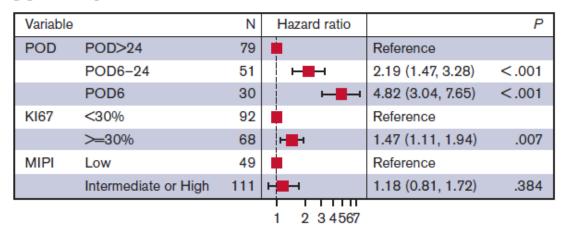




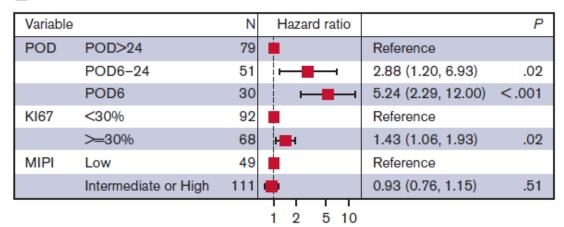
Median 26 months for CIT; NR for Ibrutinib

# Estimating duration of benefit from second line BTK inhibitors in patients with RR-MCL

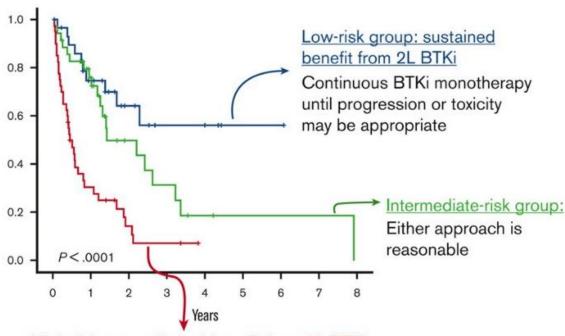
#### A PFS-2



#### B OS-2



The MCL BTKi MIPI categorizes these results into three clinically relevant PFS2 subgroups (also in OxMD).

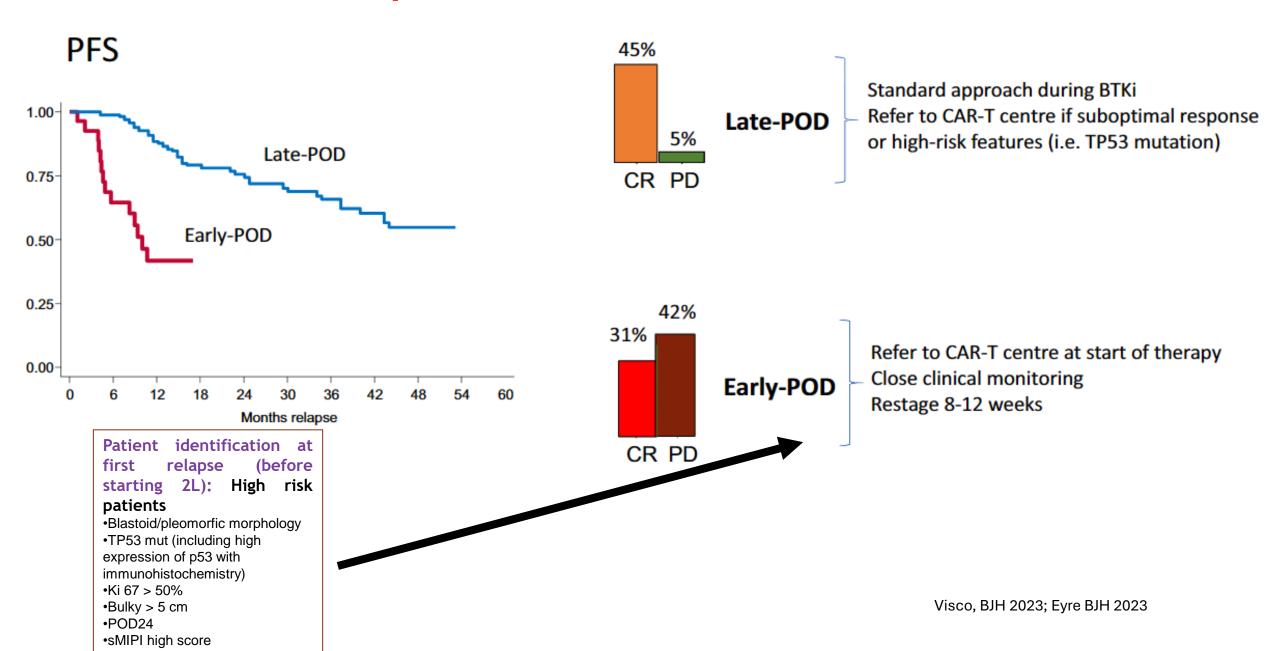


High-risk group: limited benefit from 2L BTKi

Would benefit from alternatives to continuous BTKi monotherapy

- Early CAR T-cell therapy
- Early Allogeneic SCT
- Novel agents as standalone therapy or together with BTKi

## **Ibrutinib at first relapse and CarT**



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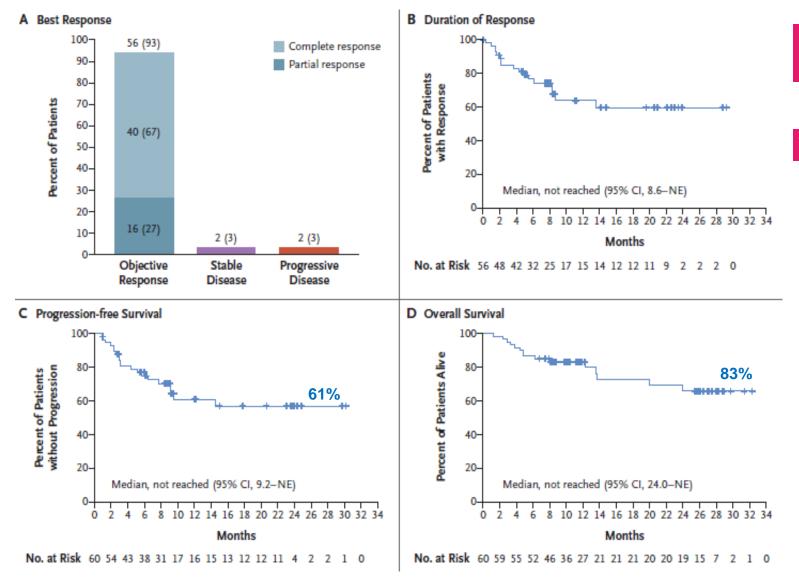
Ibrutinib

Third-line Treatment

Brexucabtagene autoleucel (after chemoimmunotherapy and BTK inhibitor)

**Pirtobrutinib** 

# MCL ZUMA 2: phase 2 study

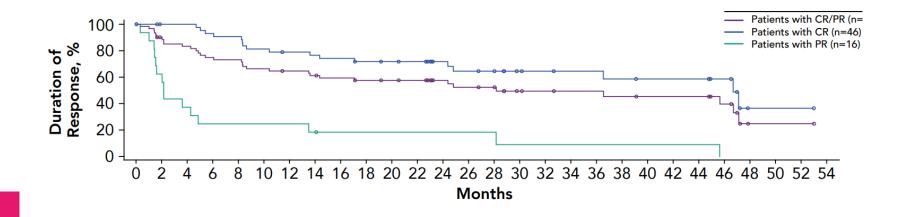


Median follow up: 12.3 months

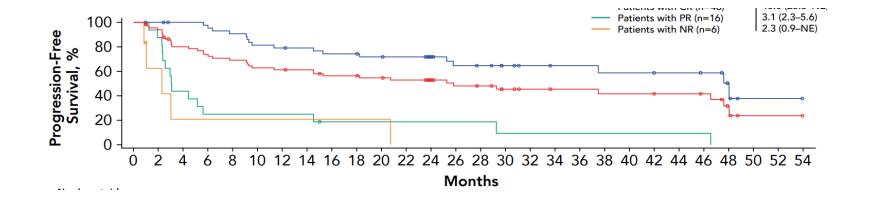
74 patients enrolled

# Three-Year Follow-up of Outcomes With KTE-X19 in Patients with R/R MCL in ZUMA-2

DOR

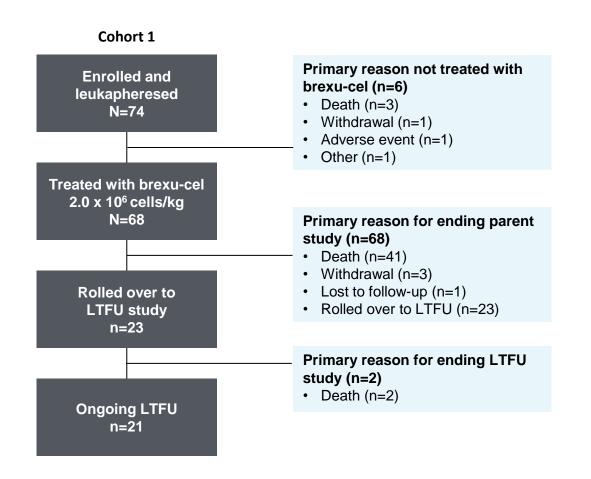


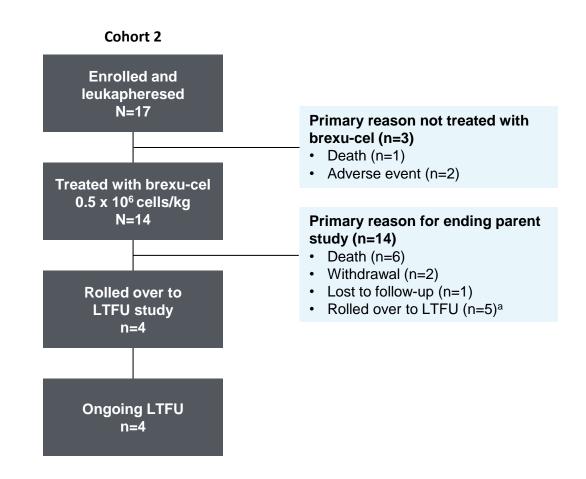
**PFS** 



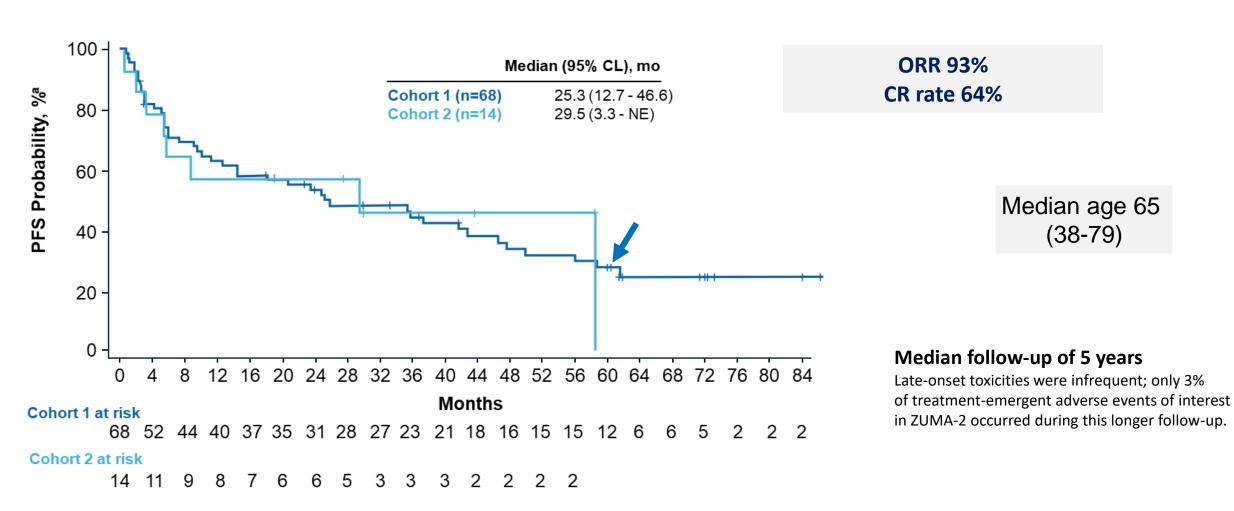


# Patient disposition for ZUMA-2 Cohorts 1 and 2: follow up 5-years





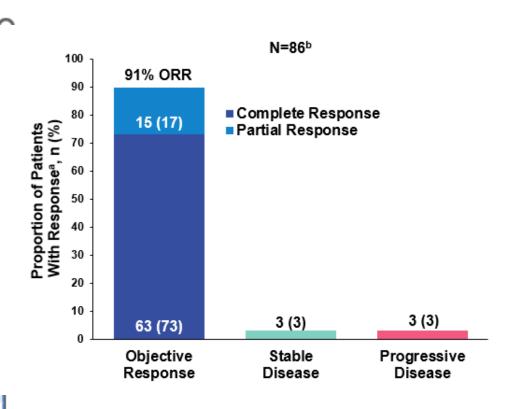
# Patient disposition for ZUMA-2 Cohorts 1 and 2: follow up 5-years



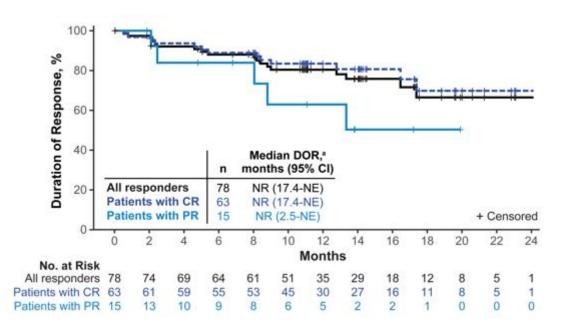
## Patient disposition and response for ZUMA-2 Cohorts 3

### **BTKI** naive

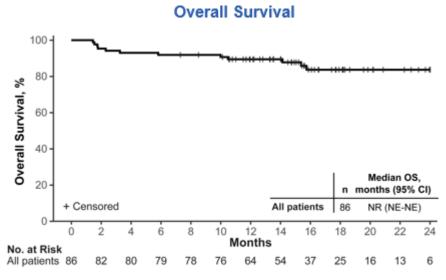
Characteristic <sup>a</sup>	Cohort 3 (N=86)
Median age (range), years	64 (40-82)
Male, n (%)	67 (78)
ECOG PS of 1, n (%)	27 (31)
Intermediate and high simplified MIPI, n (%)	63 (73)
TP53 IHC by central laboratory performed,b n (%)	59 (69)
<i>TP53</i> ≥50%, n (%)	7 (8)
TP53 mutation status by local laboratory performed,° n (%)	33 (38)
P Yes	15 (17)
No	18 (21)
Ki-67 IHC by central laboratory performed,b n (%)	59 (69)
Ki-67 ≥30%	40 (47)
Ki-67 ≥50%	18 (21)
LDH relative to upper limit, n (%)	
LDH >ULN	49 (57)
Median tumor burden (SPD) by central read (mm <sup>2</sup> ),d (range)	1734 (204-31,212)
Extranodal disease, n (%)	45 (52)
Bone marrow involvement from diagnosis history, n (%)	34 (40)



# Patient disposition for ZUMA-2 Cohorts 3: survival curves

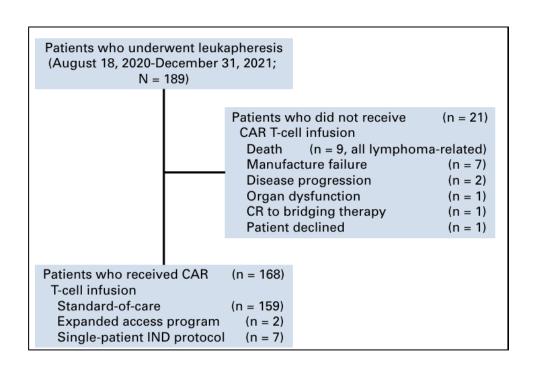


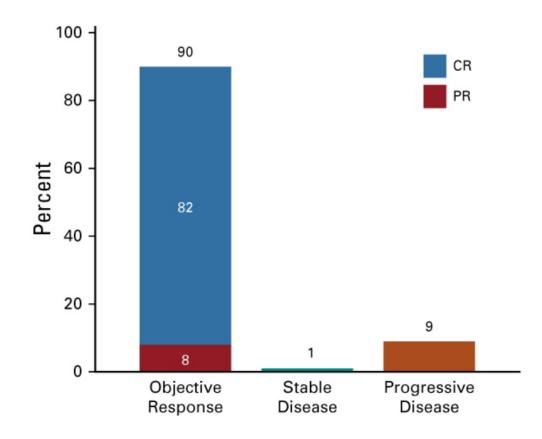
#### Progression-Free Survival® Progression-Free Survival, % 80 60 40 n months (95% CI) 20 15 NR (3.6-NE) + Censored 12 14 Months No. at Risk 35 55 30 10 10



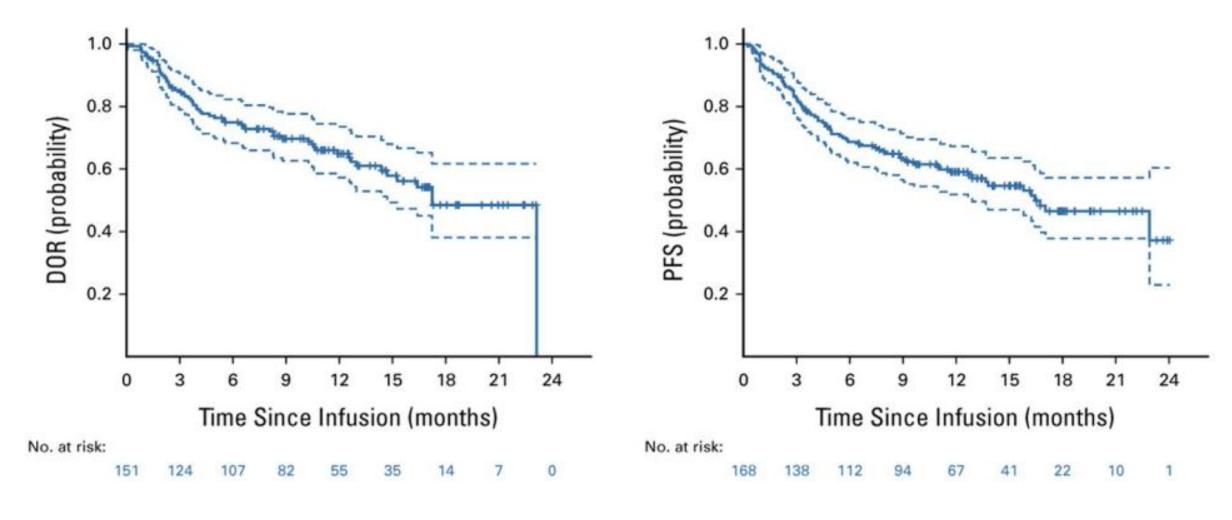
# Brexu-cel for R/R MCL in Standard of Care Practice: results from the US consortium

US Lymphoma CAR T Consortium: retrospective, multicenter study in patients receiving KTE-X19 (n= 189)

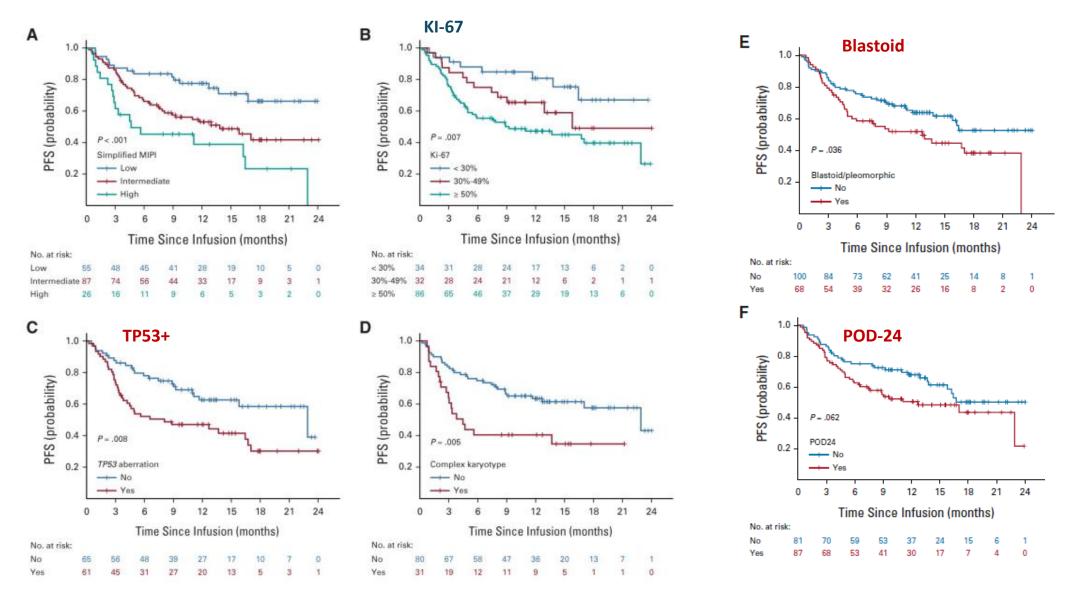




### **Brexu-cel for R/R MCL in Standard of Care Practice**

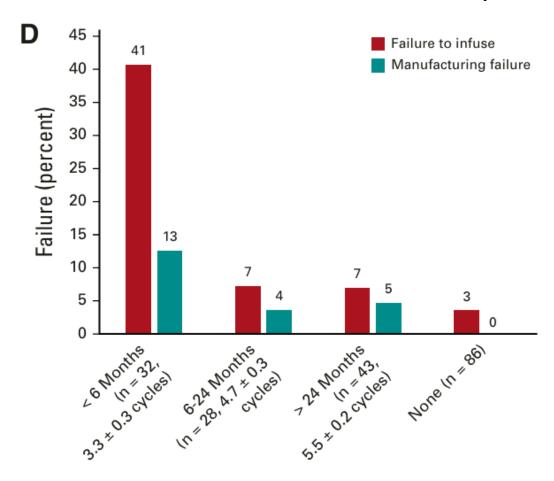


### Brexu-cel for R/R MCL in Standard-of-Care Practice

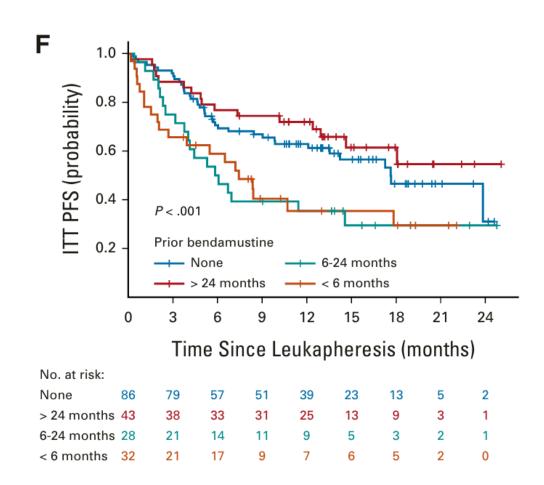


## **Prior Bendamustine exposure and outcomes**

### 103/189 patients received prior bendamustine



Prior Bendamustine Exposure

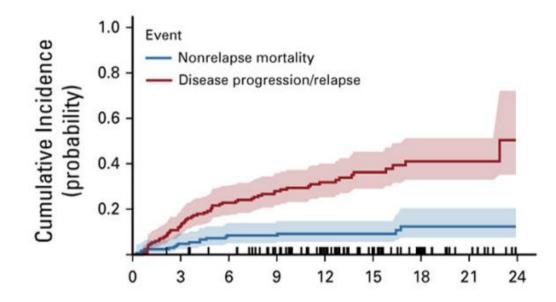


# **Short term and long term toxicity**

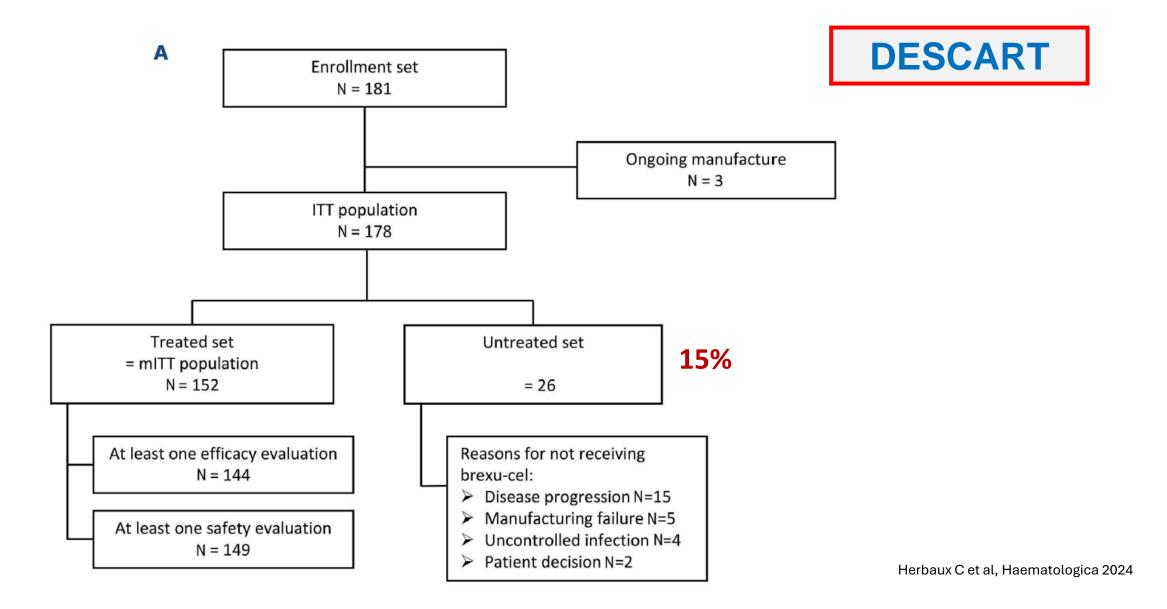
- The incidences of CRS and ICANS were comparable to those reported in ZUMA-2.
- Tocilizumab and corticosteroids use appeared to be more frequent in this Consortium study cohort

The non relapse mortality was 9.1% at 1 year, primarily because of infections.

	CRS,	ICANS,	ZUMA-2	ZUMA-2
	n (%)	n (%)	CRS (%)	NE (%)
Total	86 (91%)	57 (60%)	91%	63%
Max Grade*				
1-2	78 (82%)	24 (25%)	76%	32%
3-4	8 (8%)	33 (35%)	15%	31%
Days to onset	4 (0-11)	6 (1-15)	2 (1-13)	7
Days to max Grade	5 (0-7)	7 (3-15)	-	-
Duration	5 (1-33+)	6 (2-144+)	11	12

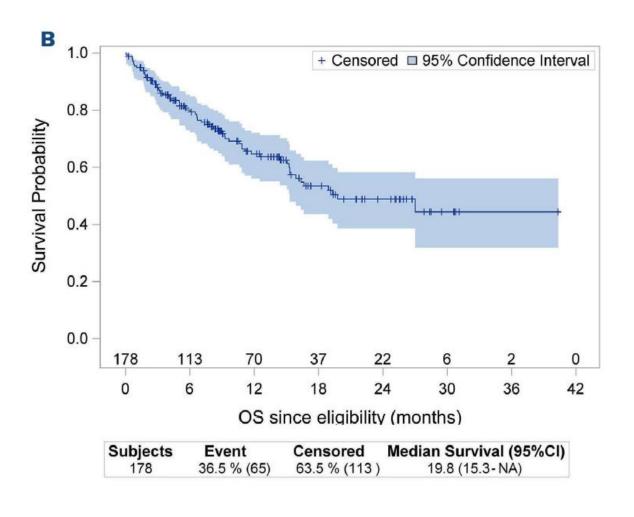


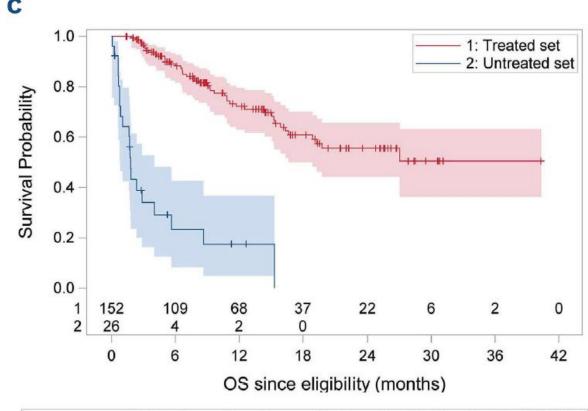
# Brexucabtagene Autoleucel for R/R MCL in Standard-of-Care Practice



# Brexucabtagene Autoleucel for R/R MCL in Standard-of-Care Practice







	Subjects	Event	Censored	Median Survival (95% CI)
Treated set	152	29.6 % (45)	70.4 % (107)	Not reached (18.9 - NA)
Untreated set	26	76.9 % (20)	23.1 % (6)	1.8 (0.9-4)

#### ORIGINAL PAPER

**BJHaem** 

Transplantation and Cellular Therapy

Brexucabtagene autoleucel in-vivo expansion and BTKi refractoriness have a negative influence on progression-free survival in mantle cell lymphoma: Results from CART-SIE study



**CART-SIE** 

PI: Prof Paolo Corradini

Participants: all Italian qualified centers for CAR-T treatment

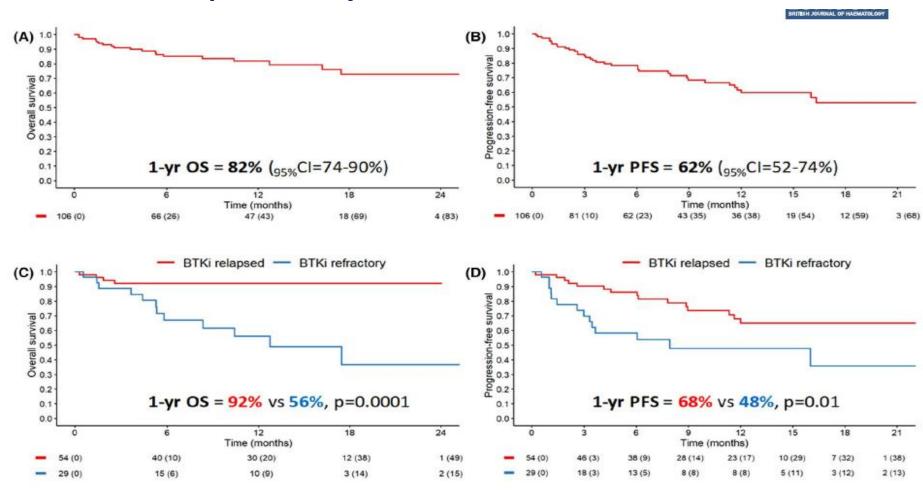
Aim of this analysis was to evaluate efficacy and safety outcomes of patients with R/R MCL treated with brexu-cel

March 2019 – July 2024: 106 MCL

## Brexucabtagene autocell in real word: PFS and OS

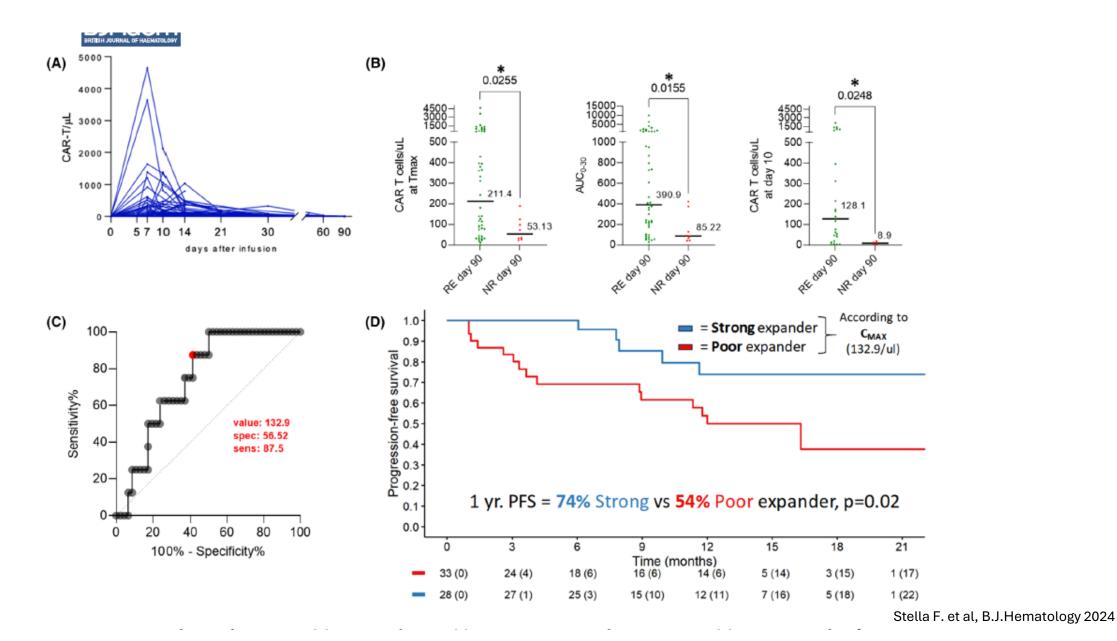
### **CART-SIE**

### Responser day + 90: ORR 77%, CR 70%



Median follow-up: 12.07 months (IQR: 5.95, 17.86

## In vivo Brexu-cell exspansion



# Patient journey for MCL



- ❖ Clinical monthly monitoring for at least the first 3 months
- ❖ Disease assessment 2-3 months after BTKi initiation\* (imaging)

### BTKi 2L



Brexu-cel 3L

Patient identification at first relapse (before starting 2L): High risk patients

- Blastoid/pleomorfic morphology
- •TP53 mut (including high expression of p53 with immunohistochemistry)
- •Ki 67 > 50%
- •Bulky > 5 cm
- •POD24
- •sMIPI high score



Early referral & Close patient's monitoring during 2L Patient identification under BTKi 2L

\*SD o PD

\*PR

\*CR

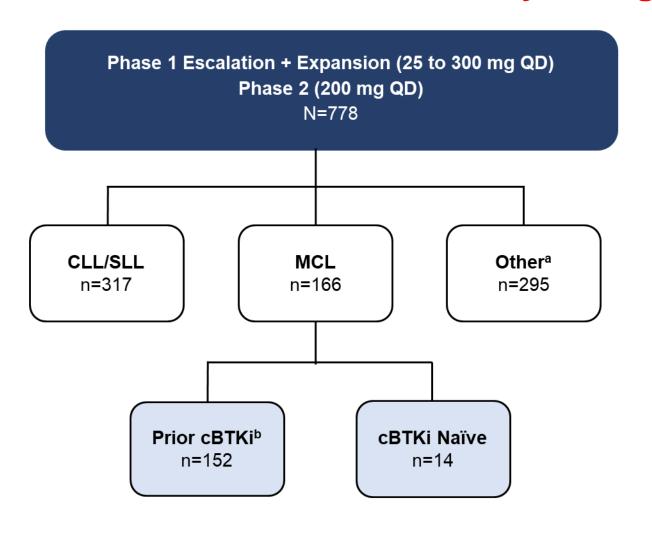
1





- · Refer patient to QTC
- Clinical monthly monitoringDisease assessment at 6 month
- Disease assessment at 6 month post BTKi initiation → continue active monitoring in responding patients (PR/CR)
- Continue active monitoring
- Refer patient to QTC at relapse

### Pirtobrutinib Phase 1/2 BRUIN Study: Design, Eligibility and Enrollment



Phase 1 3+3 design

- 28-day cycles
- Intra-patient dose escalation allowed
- Cohort expansion permitted at doses deemed safe

### Eligibility

- Age ≥18
- ECOG 0-2
- Active disease and in need of treatment
- Previously treated

### Key endpoints

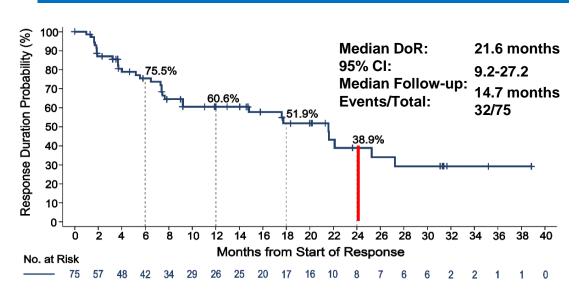
- Safety/tolerability
- Determine MTD and RP2D
- Pharmacokinetics
- Efficacy (ORR according to Lugano criteria, DoR, PFS, and OS)

Data cutoff of 05 May 2023 (NCT03740529). a Other includes DLBCL, WM, FL, MZL, Richter transformation, B-PLL, Hairy Cell Leukemia, PCNSL, and other transformations. Prior cBTKi includes Primary Analysis Set (PAS) n=90 and Supplemental Cohort n=62. The PAS comprised the first 90 patients enrolled and served as the primary efficacy population for regulatory interactions and met the following criteria:; had measurable disease, had received a prior cBTKi containing regimen, had no known central nervous system involvement. Updated data from the PAS90 population can be found in supplemental via QR code.

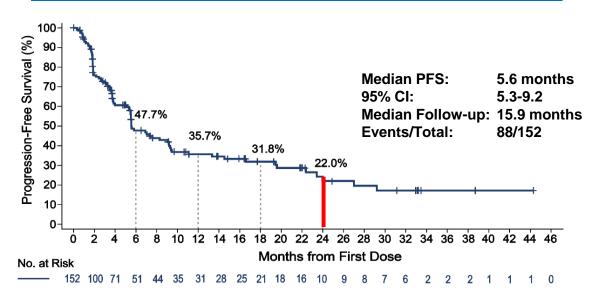
# Pirtobrutinib phase 1/2 BRUIN Study: outcomes in Prior cBTKi pts with MCL

Prior cBTKi	n=152	
ORR <sup>b</sup> % (95% CI)	49.3 (41.1-57.6)	
Best Response, n (%)		
CR	24 (15.8)	
PR	51 (33.6)	

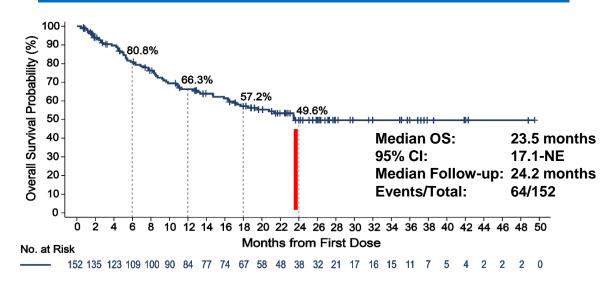
### **Duration of Response**



### **Progression-Free Survival**



### **Overall Survival**

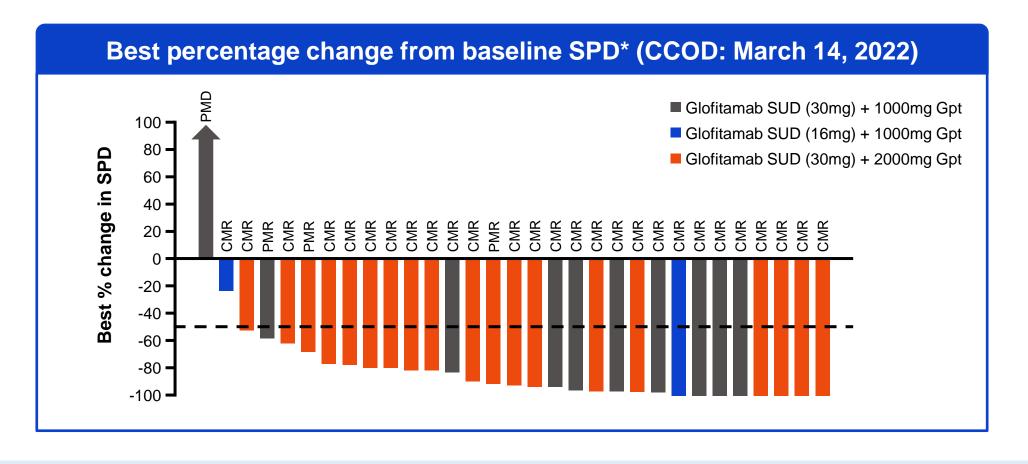


### Glofitamab RR-MCL: step-up dosing: baseline characteristics by prior BTKi

n (%) of pati	ents unless stated	Prior BTKi (n=31)*	BTKi naïve (n=29)*	All patients (N=60)*
Median age,	years (range)	70.0 (41–84)	72.0 (52–86)	72.0 (41–86)
Male		23 (74.2)	21 (72.4)	44 (73.3)
Ann Arbor s	stage III/IV	28 (90.3)	24 (82.8)	52 (86.7)
MCL IPI sco	re ≥6	7 (22.6)	8 (27.5)	15 (25.0)
Median no. c	of prior lines (range)	3.0 (1–5)	2.0 (1–4)	2.0 (1–5)
	e since last prior therapy to first study nonths (range)	1.3 (0.1–53.2)	7.4 (1.1–132.5)	2.4 (0.1–132.5)
	e since last anti-CD20 therapy to first study nonths (range)	15.1 (0.7–159.0)	25.1 (1.4–132.5)	16.3 (0.7–159.0)
Refractory status	Refractory to any prior therapy	30 (96.8)	20 (69.0)	50 (83.3)
	Refractory to 1L therapy	17 (54.8)	14 (48.3)	31 (51.7)
	Refractory to last prior therapy	27 (87.1)	17 (58.6)	44 (73.3)

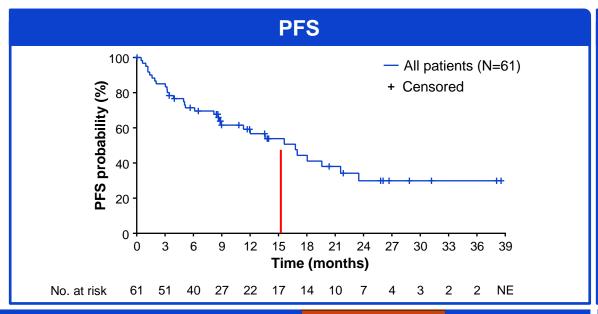
A higher proportion of patients with prior BTKi therapy were refractory to their last prior therapy compared with BTKi-naïve patients

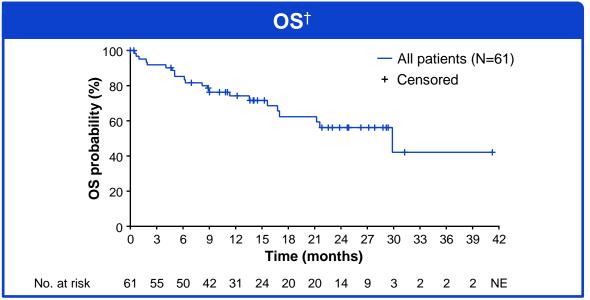
## Glofitamab step-up dosing: Antitumor activity



All glofitamab regimens investigated showed activity in R/R MCL

### Glofitamab step-up dosing: Time-to-event endpoints





	Prior BTKi n=32*	All patients N=61*
Median PFS follow-up, months (95% CI)	26.1 (13.5–31.2)	19.6 (11.9–26.1)
Median PFS, months (95% CI)	8.6 (3.4–15.6)	16.8 (8.9–21.6)
15-month PFS rate, % (95% CI)	33.0 (14.8–51.1)	54.0 (40.1–67.8)

	Prior BTKi n=32*	All patients N=61*
Median OS follow-up, months (95% CI)	24.7 (13.6–28.8)	21.8 (14.0–24.9)
Median OS, months (95% CI)	21.2 (9.0-NE)	29.9 (17.0-NE)
15-month OS rate, % (95% CI)	55.0 (36.5–73.6)	71.4 (59.3–83.5)

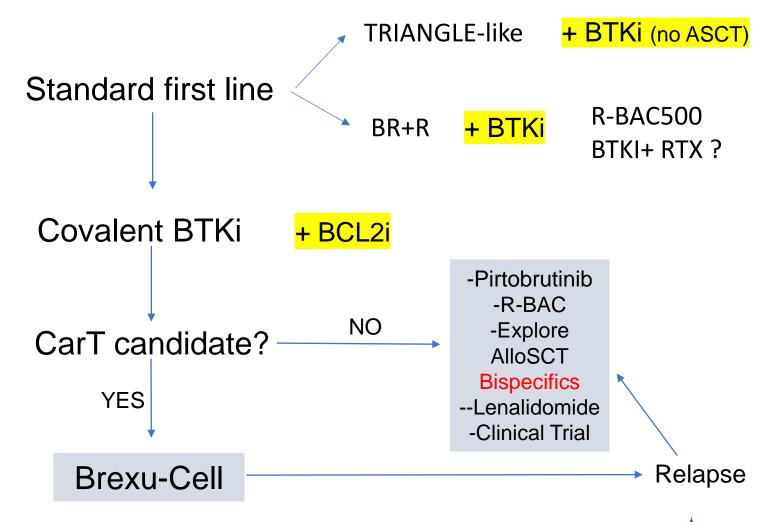
Clinically significant PFS and OS at 15 months were achieved with fixed-duration glofitamab

# **Treatment algorithm**

**Upfront** 

First relapse

Second relapse or further



Courtesy of Carlo Visco

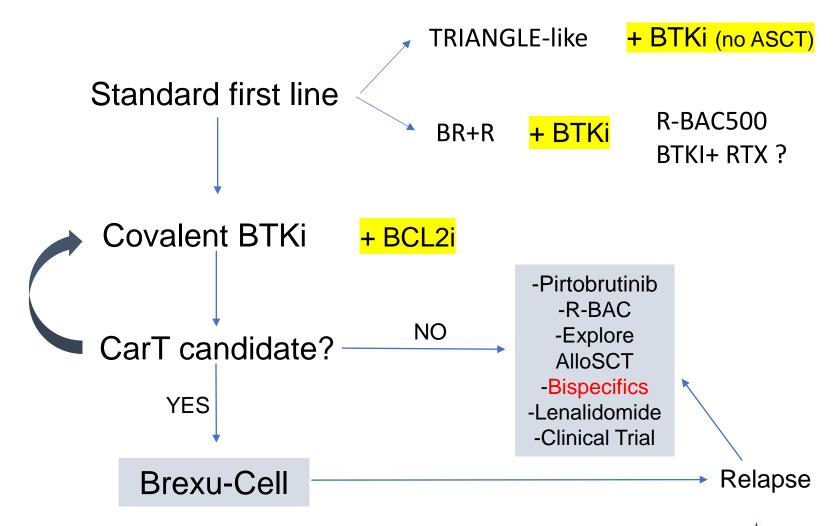


# **Treatment algorithm**

**Upfront** 

First relapse

Second relapse or further



Courtesy of Carlo Visco





Gruppo per la terapia dei linfomi non Hodgkin Ematologia Sapienza Roma









Grazie!

... a voi tutti per l'attenzione