

2020



Progetto Ematologia Romagna

Come si inseriscono i nuovi farmaci

Alessandro Corso



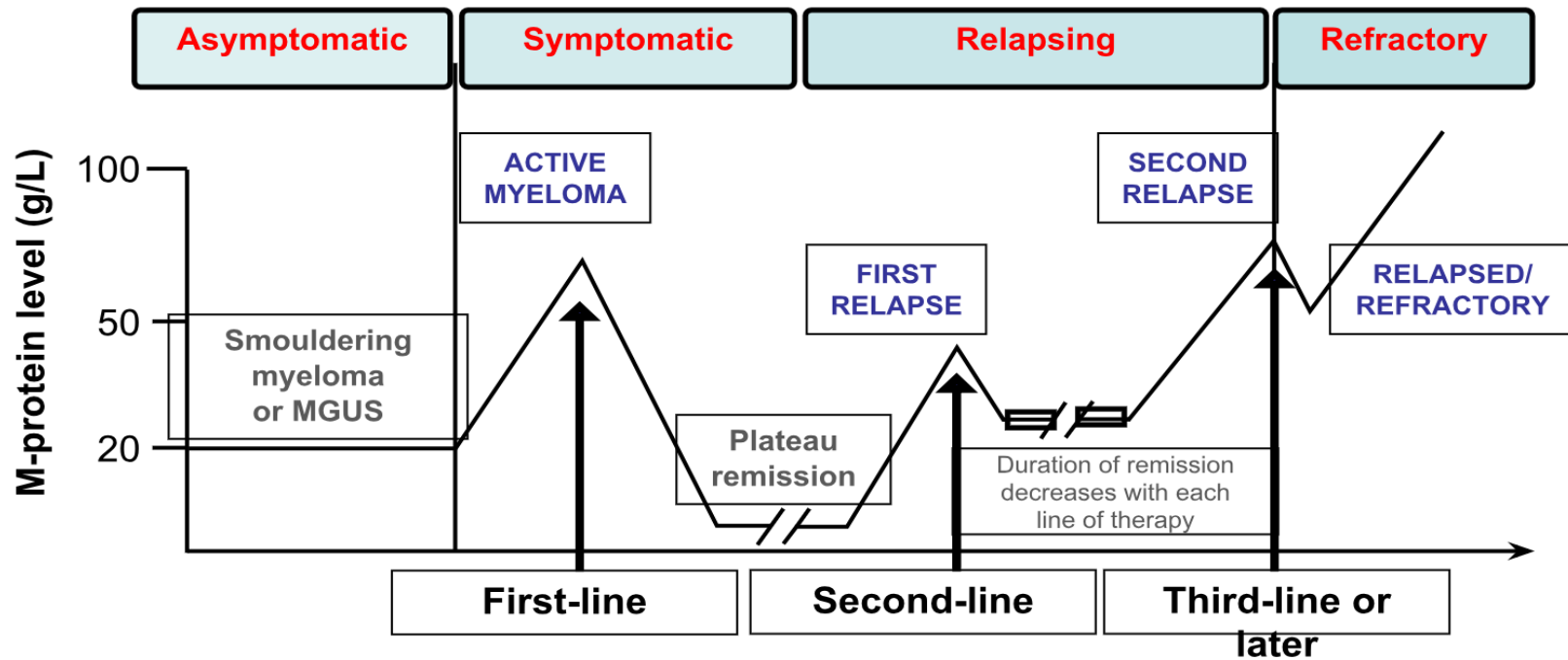
2020

Dichiarazione obbligatoria sui conflitti di interesse

Ai sensi dell'art. 3.3 sul Conflitto di Interessi, pag. 18, 19 dell'Accordo Stato-Regione del 19 aprile 2012, dichiaro che negli ultimi due anni ho avuto i seguenti rapporti anche di finanziamento con soggetti portatori di interessi commerciali in campo sanitario:

- Celgene
- Janssen-Cilag
- Amgen
- Takeda
- BMS

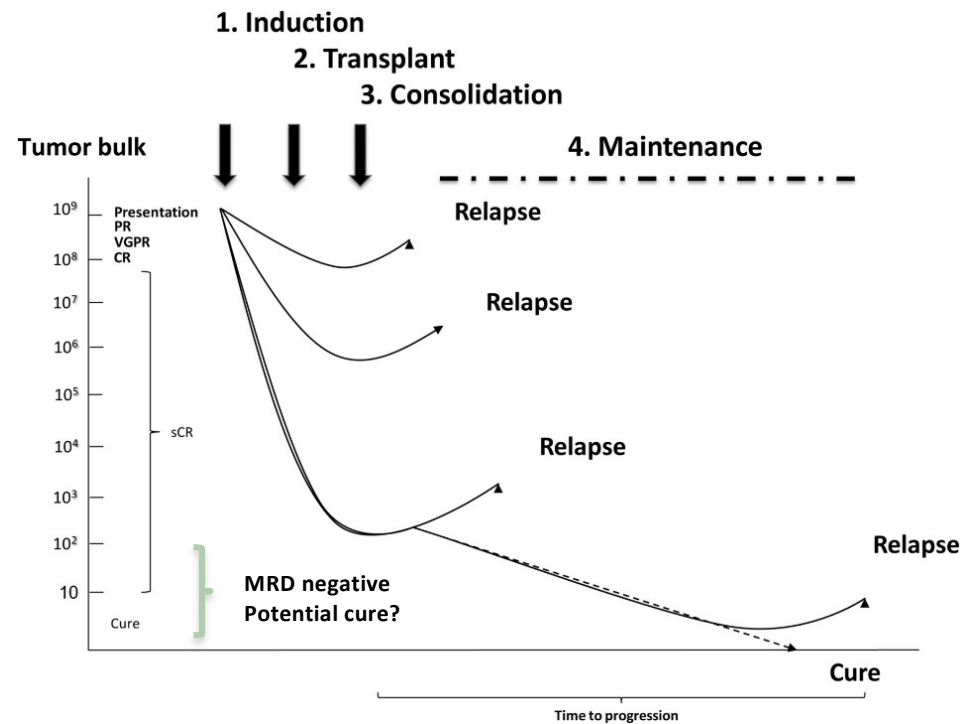
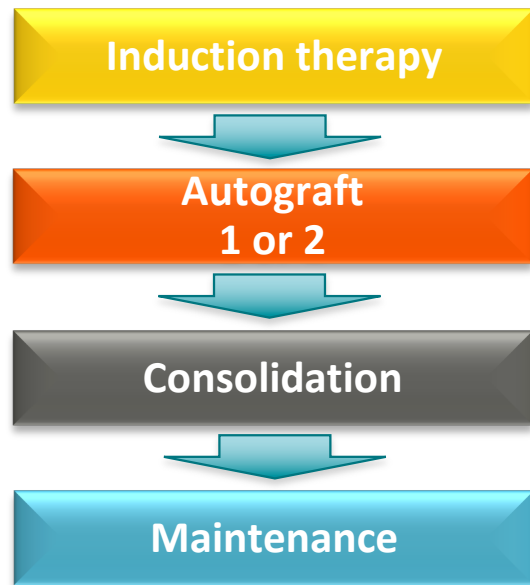
Natural History of MM



Hajek R. Strategies for the Treatment of Multiple Myeloma in 2013: Moving Toward the Cure. In: Multiple Myeloma – A Quick Reflection on the Fast Progress, Prof. Roman Hajek (Ed.), InTech 2013; doi:10.5772/55366.

TRANSPLANT ELIGIBLE

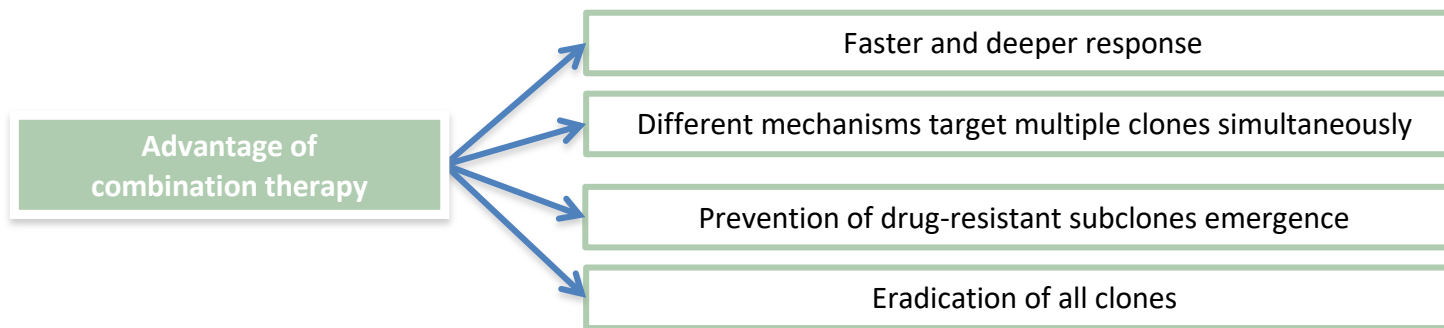
Treatment paradigm for autotransplant-eligible patients



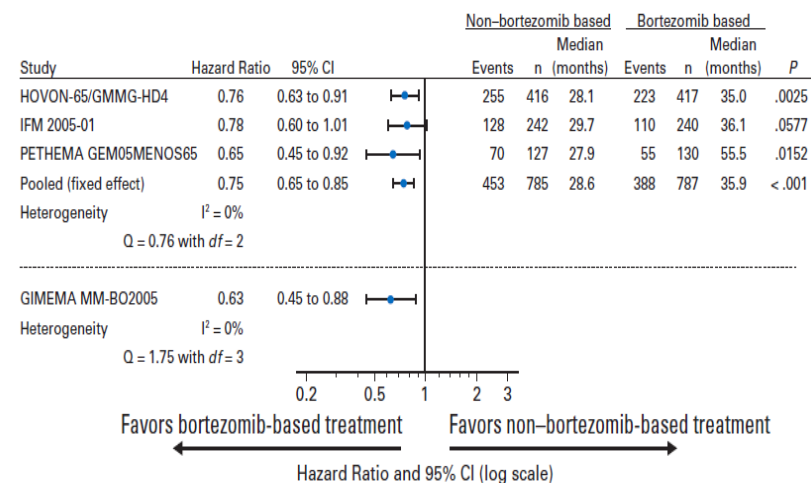
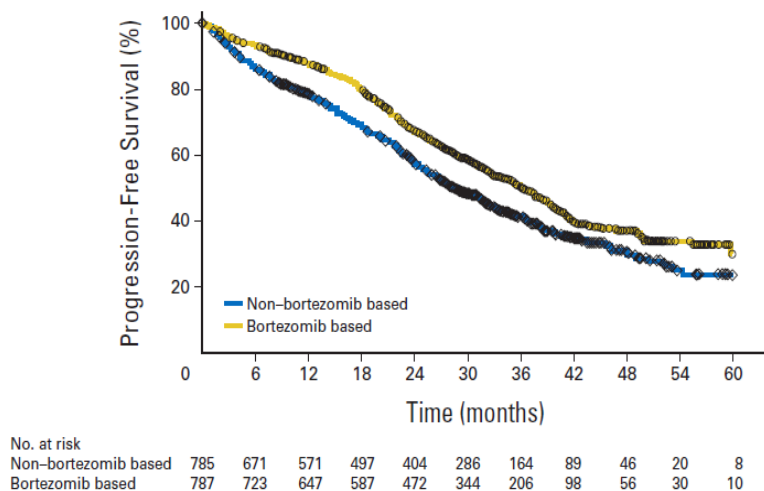
- maximize the speed and depth of tumour burden reduction
- quickly reverse disease-related complications
- prolong disease control

Cavo M, et al. Blood 2011;117(23):6063-73
 Cavo M, et al. Blood 2012;120(1):9-19
 Morgan GJ, et al. Blood. 2013;122(8):1332-4
 Kumar S, et al. Lancet Oncology 2016;17:e328-46

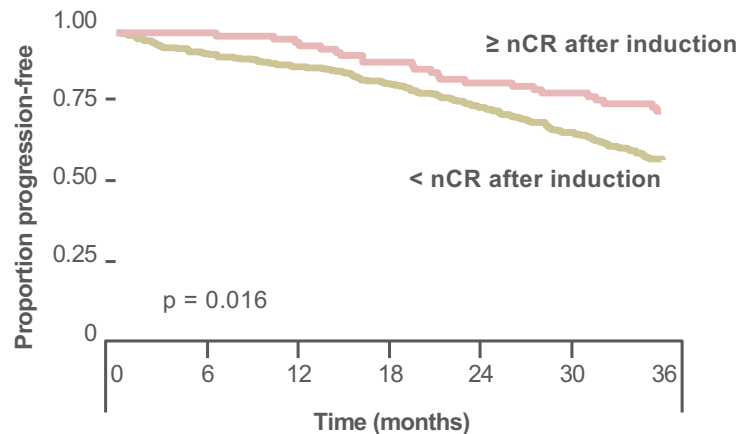
Induction: 3 drugs regimen



Meta-analysis bortezomib-based induction vs non bortezomib

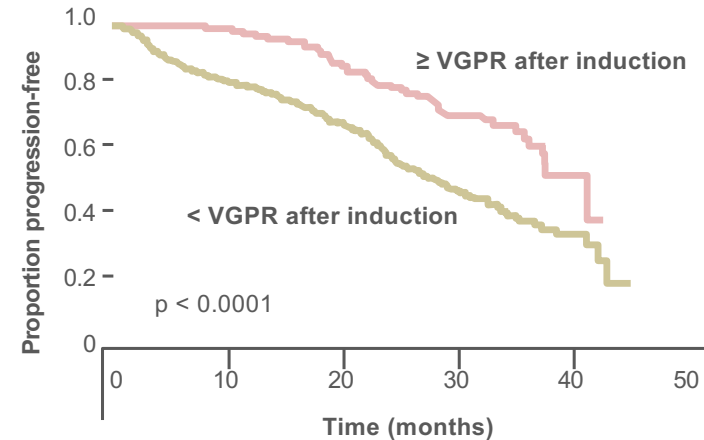


STARTING FROM INDUCTION: Achievement of high-quality response prognosticates for extended PFS after ASCT



Variable	HR (95% CI)	p value
Absence of $t(4;14) \pm del(17p)$	0.51 (0.36–0.73)	< 0.0001
B2-m \leq 3.5 mg/L	0.47 (0.33–0.67)	0.0020
Response to induction \geq nCR	0.98 (0.97–0.99)	0.0187

Cavo M, et al. Lancet. 2010;376:2075-85
Updated with unpublished data from Cavo M et al.



Variable	RR (95% CI)	p value
$t(4;14) \pm del(17p)$	1.5 (1.0–2.1)	0.0621
ISS stage 2 and 3	1.8 (1.4–2.4)	< 0.0001
Response to induction < VGPR	2.3 (1.6–3.2)	< 0.0001

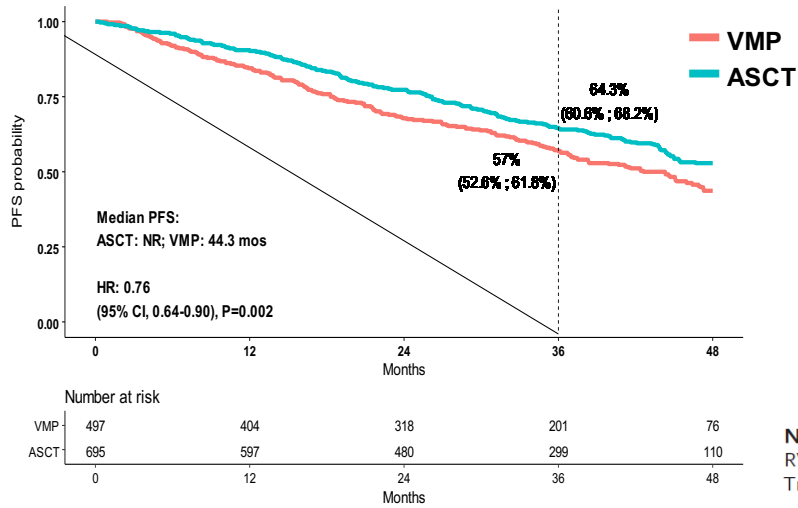
Moreau P, et al. Blood 2011;117:3041-4

Intensification

- Limits
 - Not univocal data from studies although the depth of response maintains its relevance
- In favour
 - Better control of disease at the time of transplant
- Cons
 - Delay of transplant
 - Possible toxicity or severe side effects with the intensification therapy
- Open issues
 - When?
 - If <PR
 - Before or after mobilization?
 - Before>after
 - Which scheme?
 - KRd/DRd
 - How long?
 - To the best response

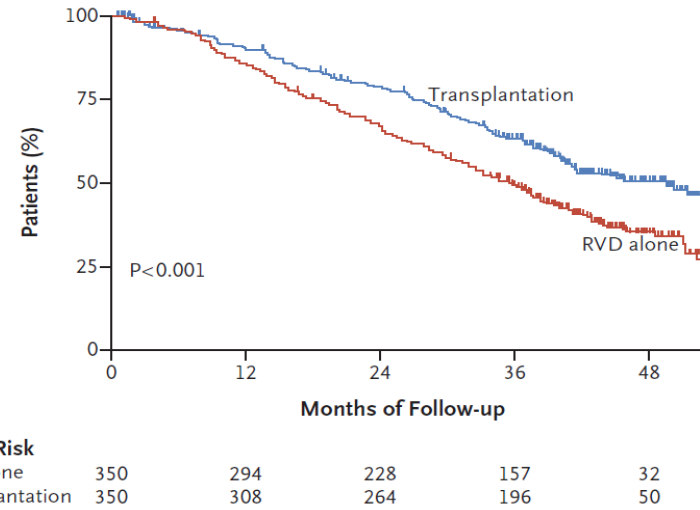
.....20 years later..... ASCT remains a standard of care

EMN02/HO95 phase 3 study: VMP vs ASCT



● Median follow-up: 37.8 months

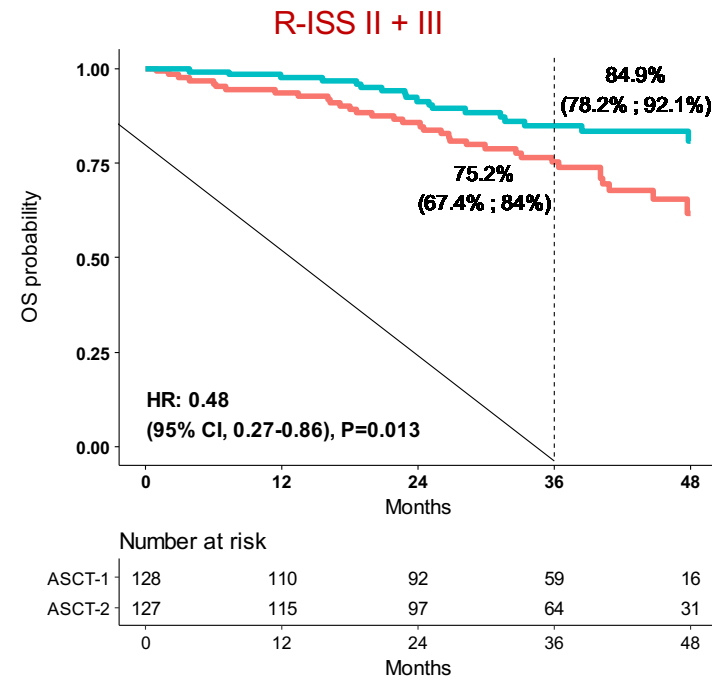
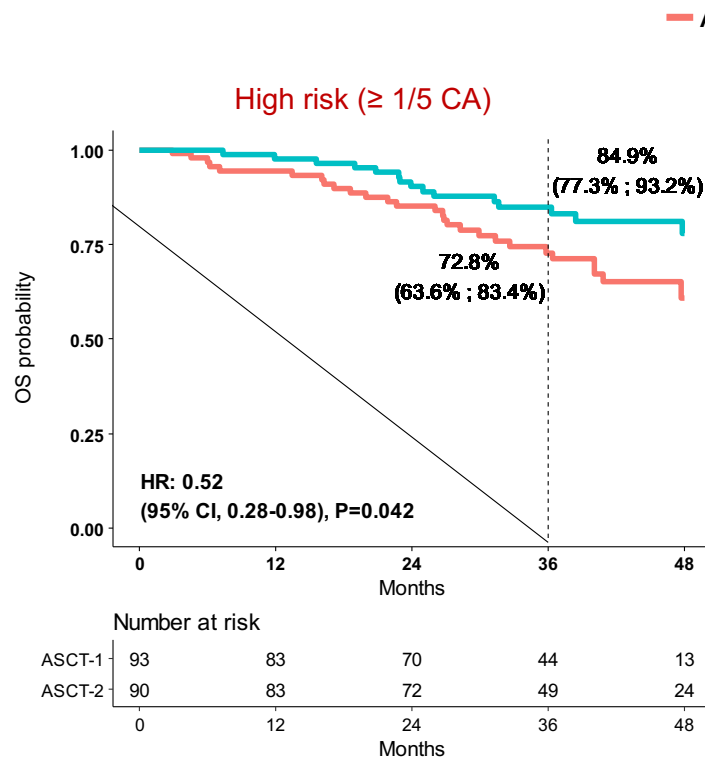
IFM 2009 phase 3 study: RVD vs ASCT



● Median follow-up: 43.5 months

MORE IS BETTER IN SPECIFIC SUBGROUPS OF PATIENTS

OS by randomization in high risk subgroups

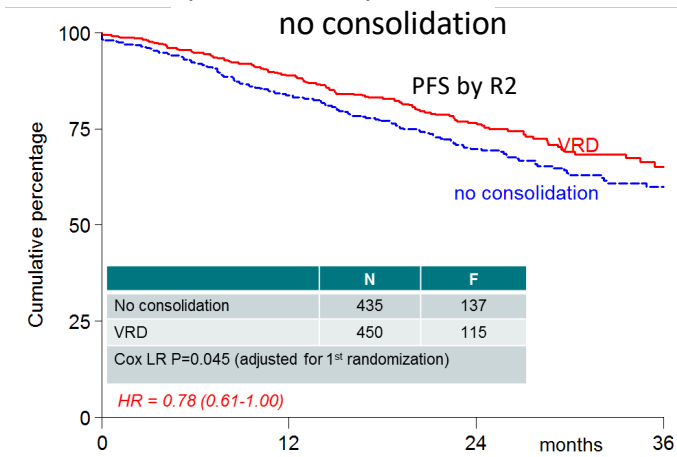


Consolidation

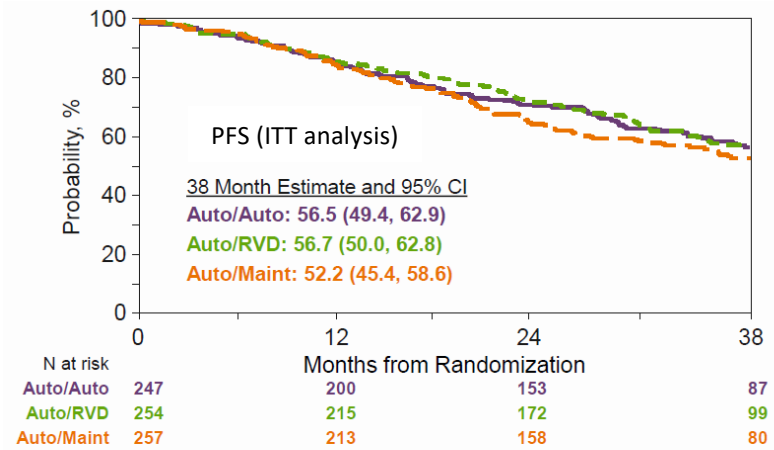
Improve response/deeper following therapy by administration of treatment for a **limited period**

VTD: upgrade to CR by 30%
VRD: upgrade CR 38% vs 26%

EMN02 phase 3 study of VRD consolidation vs no consolidation



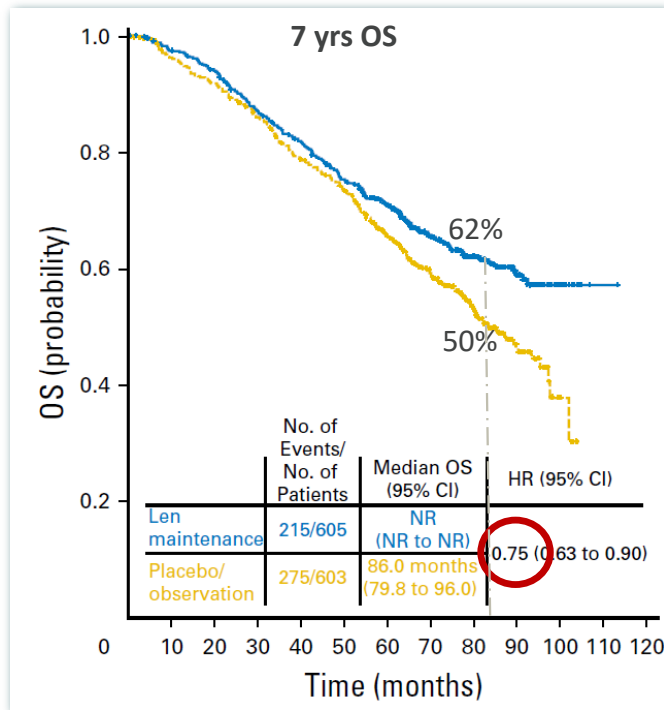
STaMINA phase 3 study of VRD consolidation vs no consolidation



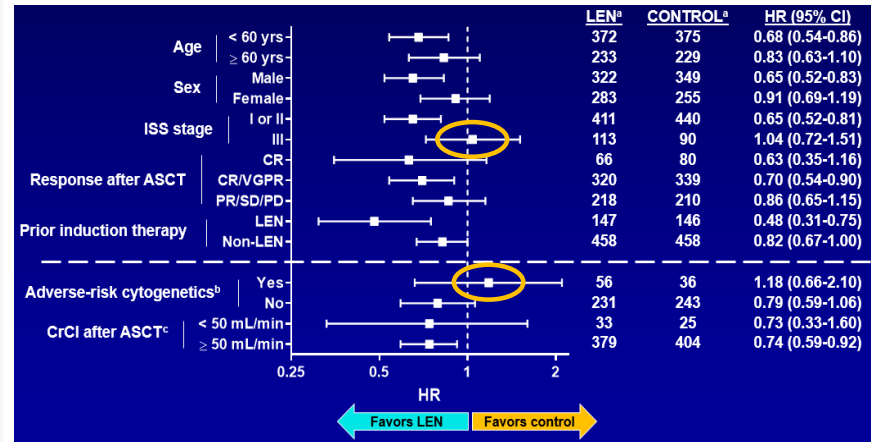
	EMN02	STAMINA
Induction regimen (%)	VCD (100)	VCD (13.4); VRD (57)
Pre-planned induction thp (mths)	2–3	2–12
Failure to receive double ASCT (%)	19.8	32
Double ASCT plus Consolidation (%)	50	0
Maintenance therapy	Len (10 mg)	Len (10–15 mg)

act 242;
Stadtmauer E, et al. Presented at ASH 2016:abstract LBA1; Cavo M, et al. Presented at IMW 2017

Lenalidomide maintenance: Meta-Analysis of phase 3 trials



OS subgroup analysis

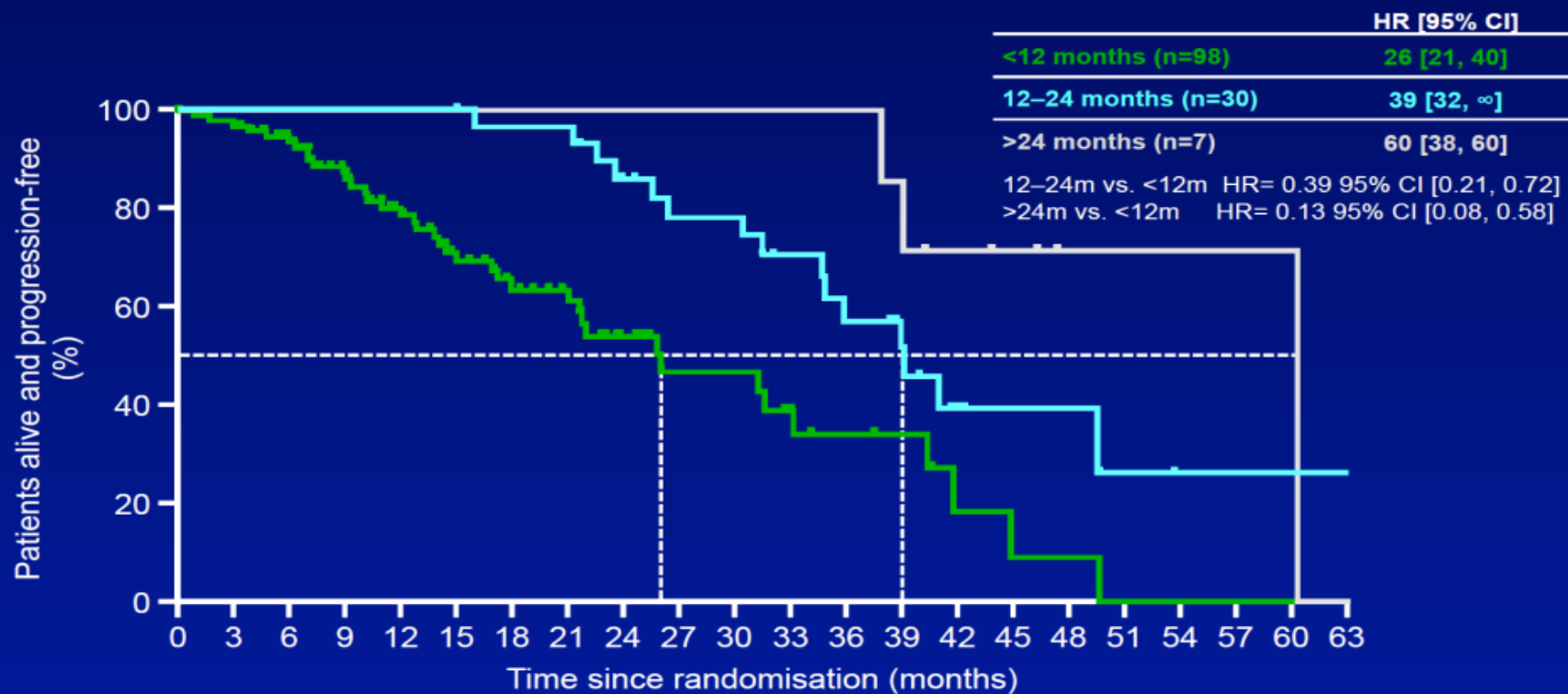


Attal M, et al. Presented at ASCO 2016:abstract 8001; McCarthy PL, et al. J Clin Oncol. 2017

- **Lenalidomide** maintenance is EMA-approved for the treatment of patients with newly-diagnosed MM who have undergone ASCT
- **Thalidomide** maintenance post ASCT is AIFA-approved (L.648)
- Some patient populations may benefit from alternative regimens

Duration of therapy

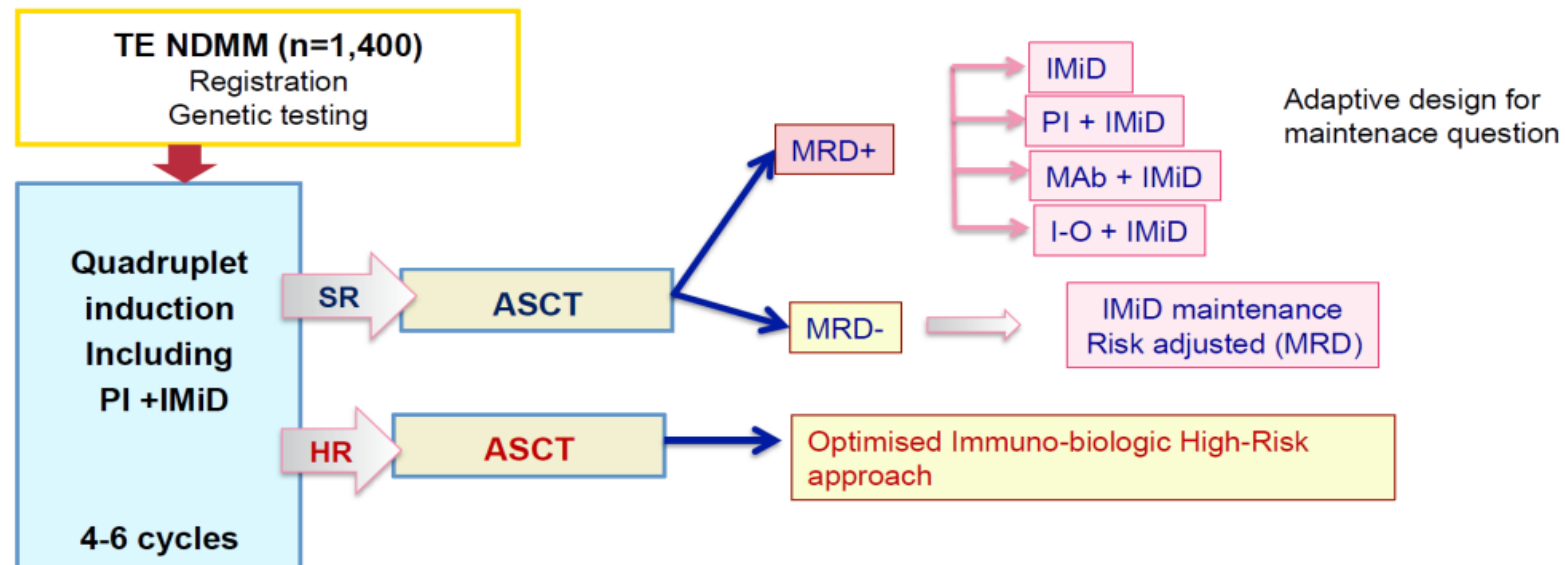
Comparison <12 months, 12–24 months and >24 months



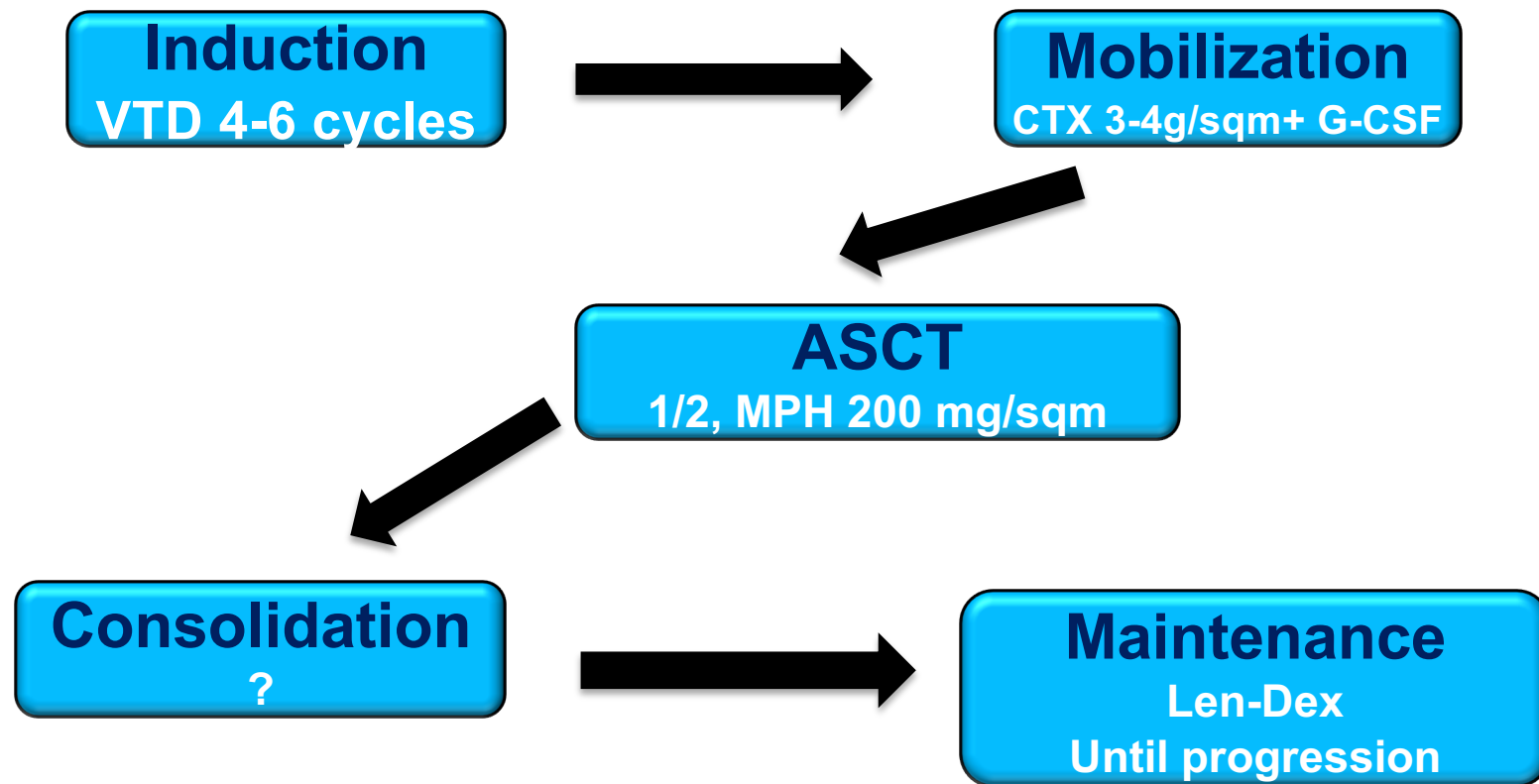
No. of patients at risk:

<12 months	96	91	81	66	54	40	31	27	18	12	12	9	6	5	2	1	1	0				
12–24 months	30	30	30	30	30	29	28	28	23	20	20	16	13	9	4	3	3	1	0			
>24 months	7	7	7	7	7	7	7	7	7	7	7	7	7	6	4	3	1	1	1	1	1	0

MRD-optimised Therapy in transplant-eligible (NCRI Myeloma XV; CI K Yong/M Cook)

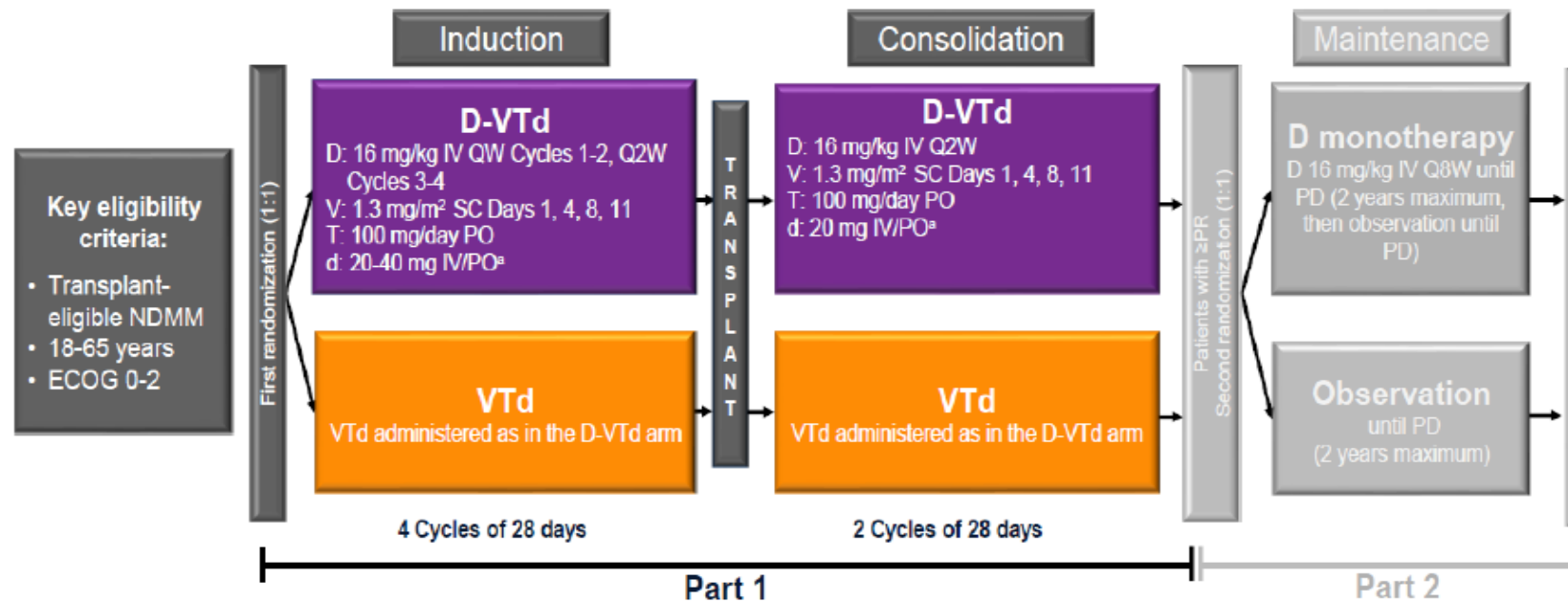


Current frontline treatment for symptomatic patient who are eligible for ASCT



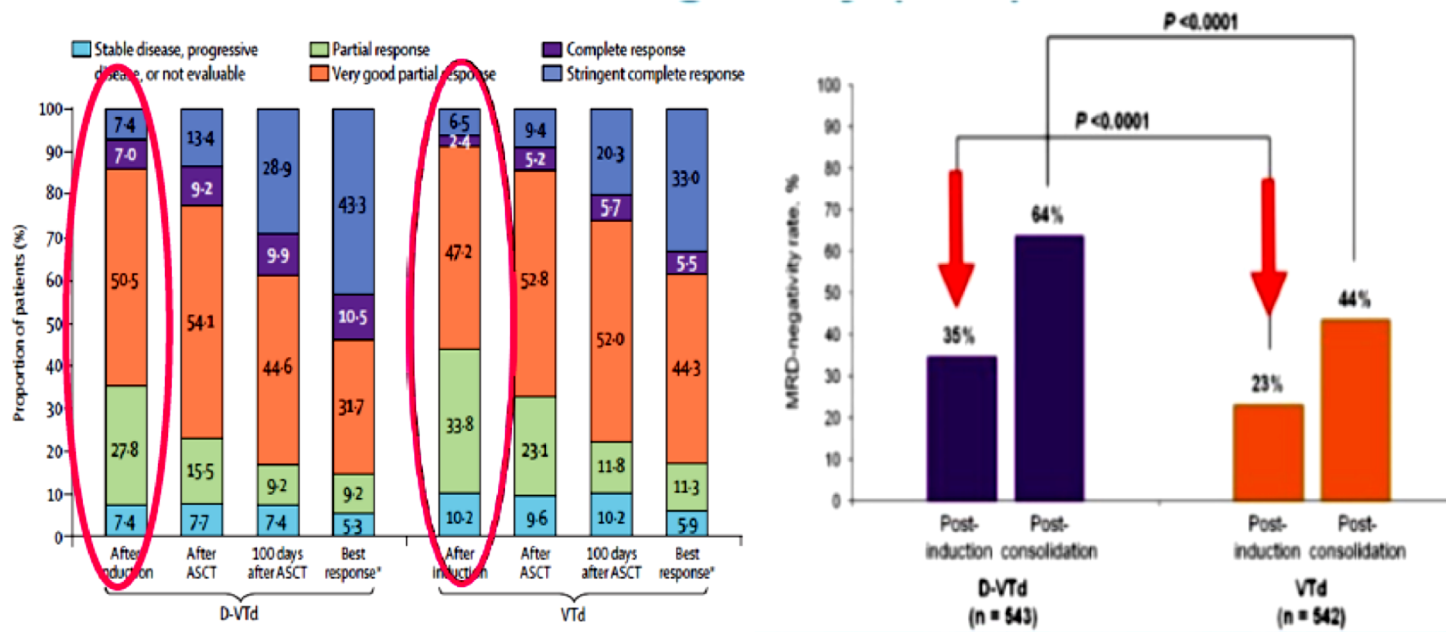
Phase 3 CASSIOPEIA Study Design

- Phase 3 study of D-VTd versus VTd in transplant-eligible NDMM (N = 1,085), 111 sites from the 9/2015 to 8/2017



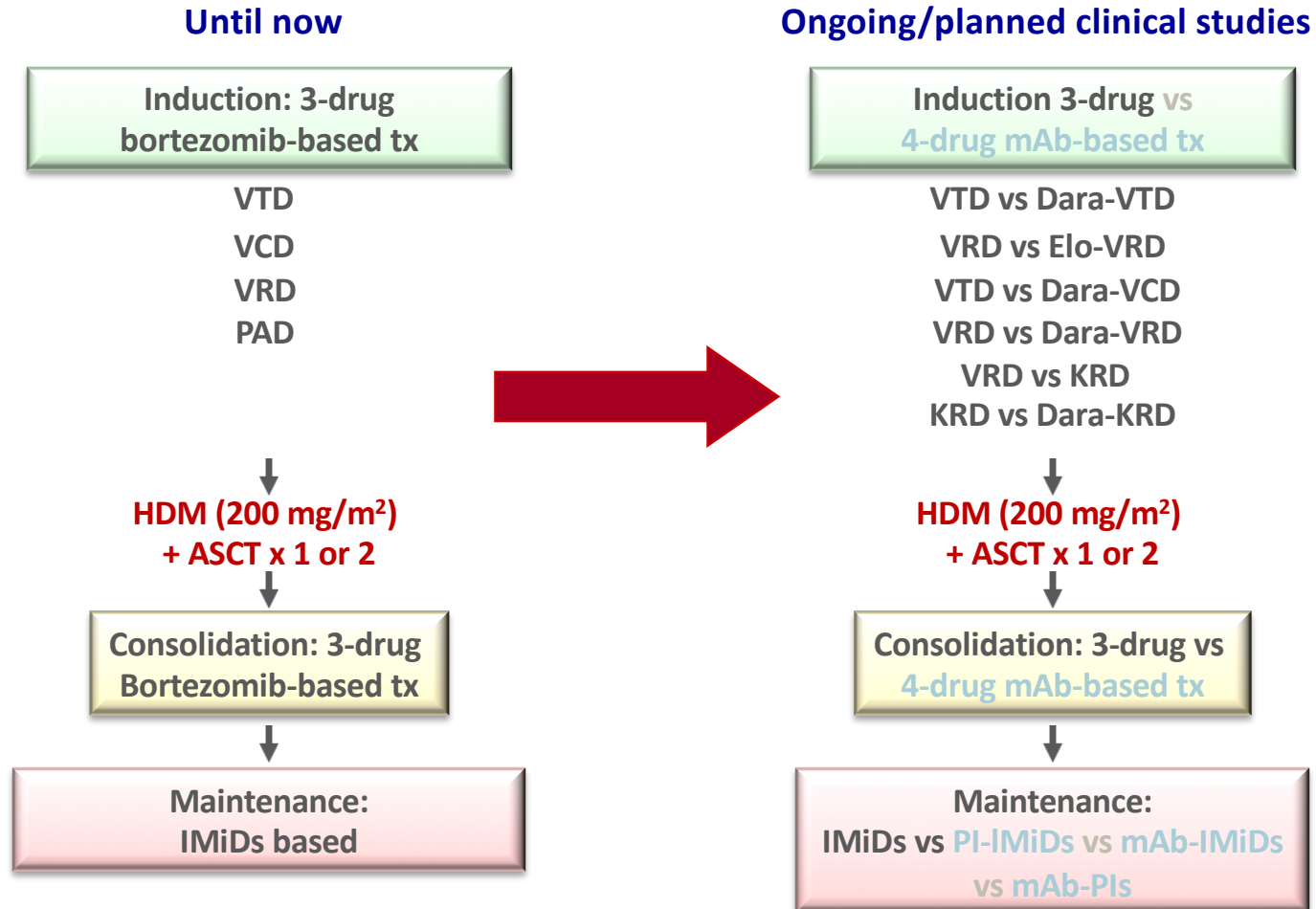
Endpoint primario: SCR a 100 giorni dall'ASCT

Post-induction rates of response and MRD-negativity (10^{-5})



Early (post-induction) significant difference in MRD-negativity rates for D-VTD versus VTd

THE FUTURE FOR THE PATIENTS!

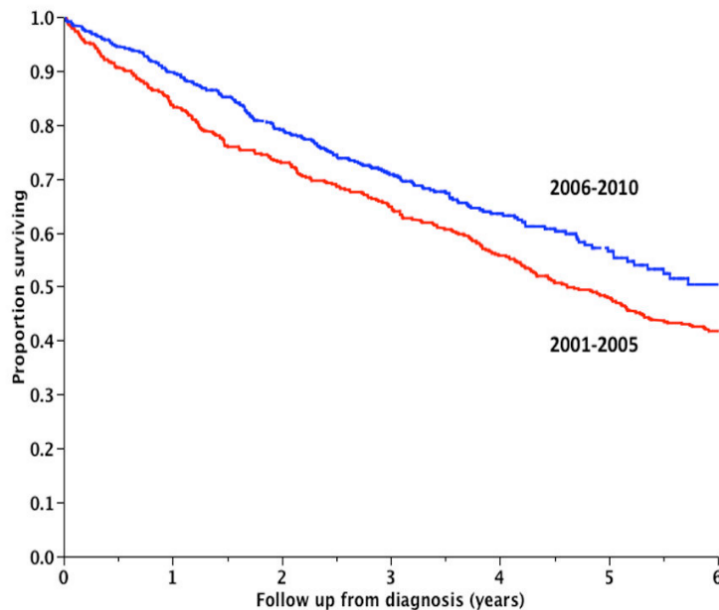


Moreau P, et al. Ann Oncol 2017;00:1–11 ; clinicaltrials.gov
identifiers: NCT02874742; NCT02541383; NCT02495922;
NCT01863550

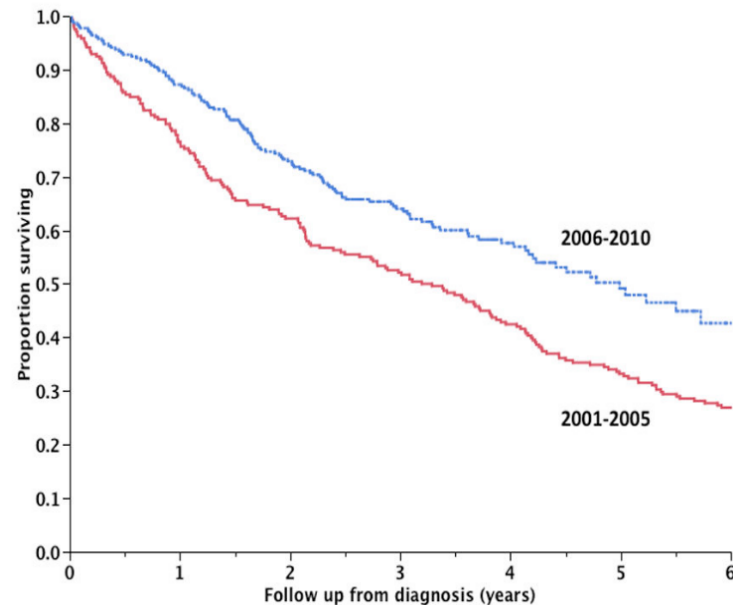
TRANSPLANT INELIGIBLE

Introduction of novel agents has improved overall survival in MM

1038 patients diagnosed 2001-2010,
median age at dg 66 years
52% >65 years, 19% >75 years of age



OS
Patients 65 years or older



The improvement was primarily seen among patients over 65 years; the 6-year OS improving from 31% to 56%; $P < 0.001$

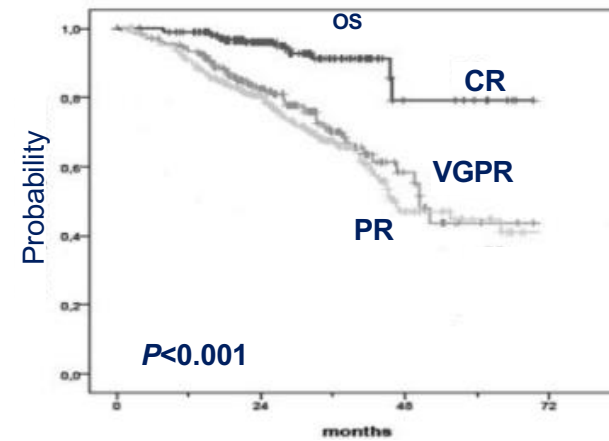
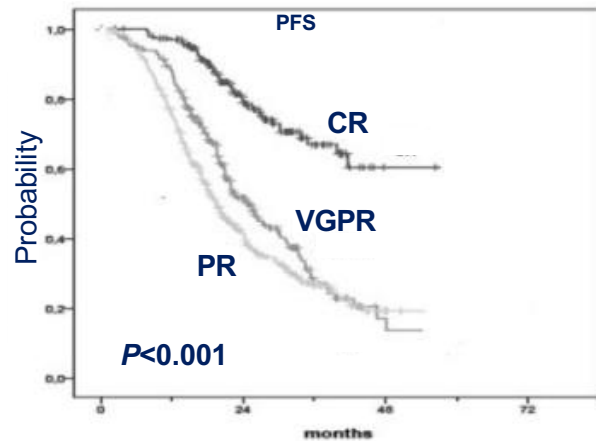
Median follow-up 5.9 years

Kumar S H, et al. Leukemia. 2014 May ; 28(5): 1122–1128.

Treatment goals

CR is associated with long-term outcome in elderly MM patients treated with novel agents

3 randomized European trials GIMEMA, HOVON and GEM groups (N=1175)
First-line treatment: MP (n=332), MPT (n=332), VMP (n=257), VMPT-VT (n=254)



Significant benefit also seen when analysis is restricted to patients >75 years old

Elderly Transplant not eligible patients are a very heterogenous group



Very fit:
active, regular
exercise



Vulnerable:
can perform limited
activities, doesn't need help



Mildly frail:
needs help for
household tasks



Severely frail:
dependent on
other people



Moderately fit:
not regularly active
but routinely walking



Moderately frail:
needs partial help
for personal care

Frailty status definition and treatment goals, treatment options and dose adjustments based on frailty status in NDMM elderly patients

	FIT	INTERMEDIATE	FRAIL
IMWG-frailty index score	0 CCI ≥ 2 :1 IADL <5: 1 ADL <4: 1 Age 76-80: 1, >80:2	1	2-5
Revised myeloma comorbidity index (R-MCI)	0-3 Age 60-69 KPS: 80-90%: 2, <70%: 3 Renal disease: eGFR <60:1 Lung disease: moderate/severe:1 Frailty: moderate or severe:1 \pm cytogenetic unfavourable: 1	4-6	7-9
MAYO FRAILTY INDEX	0 Age ≥ 70 : 1 ECOG PS ≥ 2 :1 NT-proBNP ≥ 300 mg/L	1 (Stage I) 2 (Stage II)	3
Goal of Treatment	<i>Efficacy: deep response</i>	<i>Balance efficacy and toxicity</i>	<i>Conservative approach, low toxicity</i>
Treatment Options	Full dose therapy <ul style="list-style-type: none"> ASCT Triplet regimens: VMP, VRD doublet regimens: Rd 	Full or reduced dose therapy Doublet regimens <ul style="list-style-type: none"> Rd Vd Reduced-dose triplet 	Reduced dose therapy Reduced dose doublet regimens: <ul style="list-style-type: none"> Rd, Vd Palliative + supportive care

1Line Trials NoASCT - Summary

Trial	No. Cycles	Time of treatment (months)	CR	ORR	mPFS
VMP VISTA	8 bw + 5 ow	9,5	30%	70%	21.7m
VMP Gimema	9 ow	9	30%	85%	24.8m
RD	Until Progression	18,4	20%	81%	26m
RD18	18	16,6	14%	73%	21m
MPT	18	15,4	9%	62%	21.9m

Impact of DEPTH of response on OUTCOMES

	Rd continuous in FIRST (MM-020)*1,2		VMP in VISTA*1,2
≥VGPR	48.2%	≥VGPR	41%
DoR	≥VGPR patients: 49.0 months CR: 59.1 months ≥PR: 31.5 months	DoR	CR: 24.0 months PR: 19.9 months
TTNT	CR/VGPR: 69.5 months	TTNT	CR: 37.8 months for VMP

1. Bahlis NJ, et al. *Leukemia* 2017;Epub ahead of print; 2. Facon T, et al. Presented at ASH 2016 (Abstract 241).
 1. San Miguel JF, et al. *N Engl J Med* 2008;359:906–17; 2. Harousseau J-L, et al. *Blood* 2010;116:3743–50.

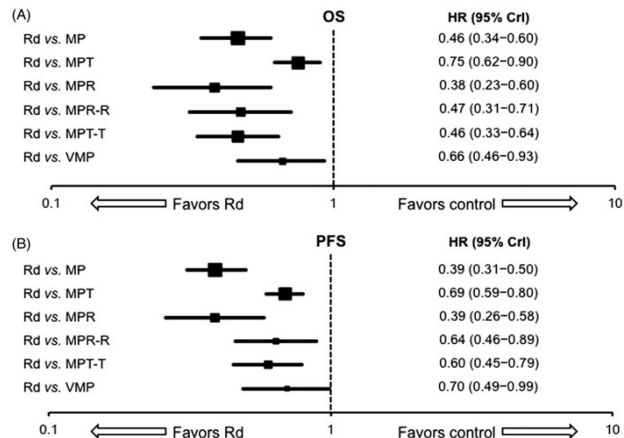


Figure 3. Mixed treatment comparison survival data: fixed-effects analyses with Rd as reference. (A) overall survival (OS); (B) progression free survival (PFS). CrI: credible interval; HR: hazard ratio; MP: melphalan and prednisone; MPR: melphalan and prednisone with lenalidomide; MPR-R: melphalan and prednisone with lenalidomide followed by lenalidomide maintenance; MPT: melphalan and prednisone with thalidomide; MPT-T: melphalan and prednisone with thalidomide followed by thalidomide maintenance; Rd: lenalidomide and low-dose dexamethasone; VMP: melphalan and prednisone with bortezomib.

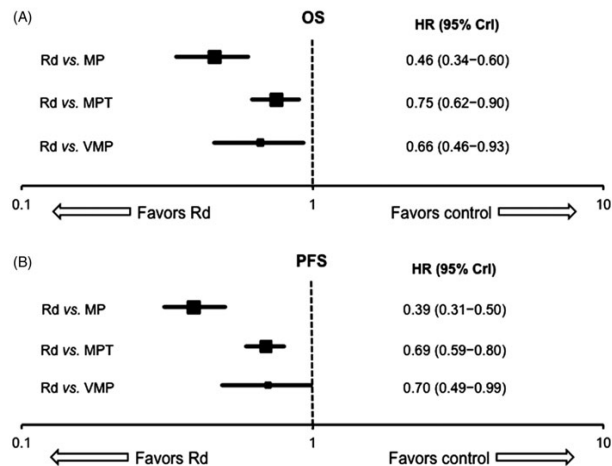


Figure 2. Mixed treatment comparison survival data: fixed effects analyses with Rd as reference. (A) overall survival (OS); (B) progression free survival (PFS). CrI: credible interval; HR: hazard ratio; MP: melphalan and prednisone; MPT: melphalan and prednisone with thalidomide; Rd: lenalidomide and low-dose dexamethasone; VMP: melphalan and prednisone with bortezomib.

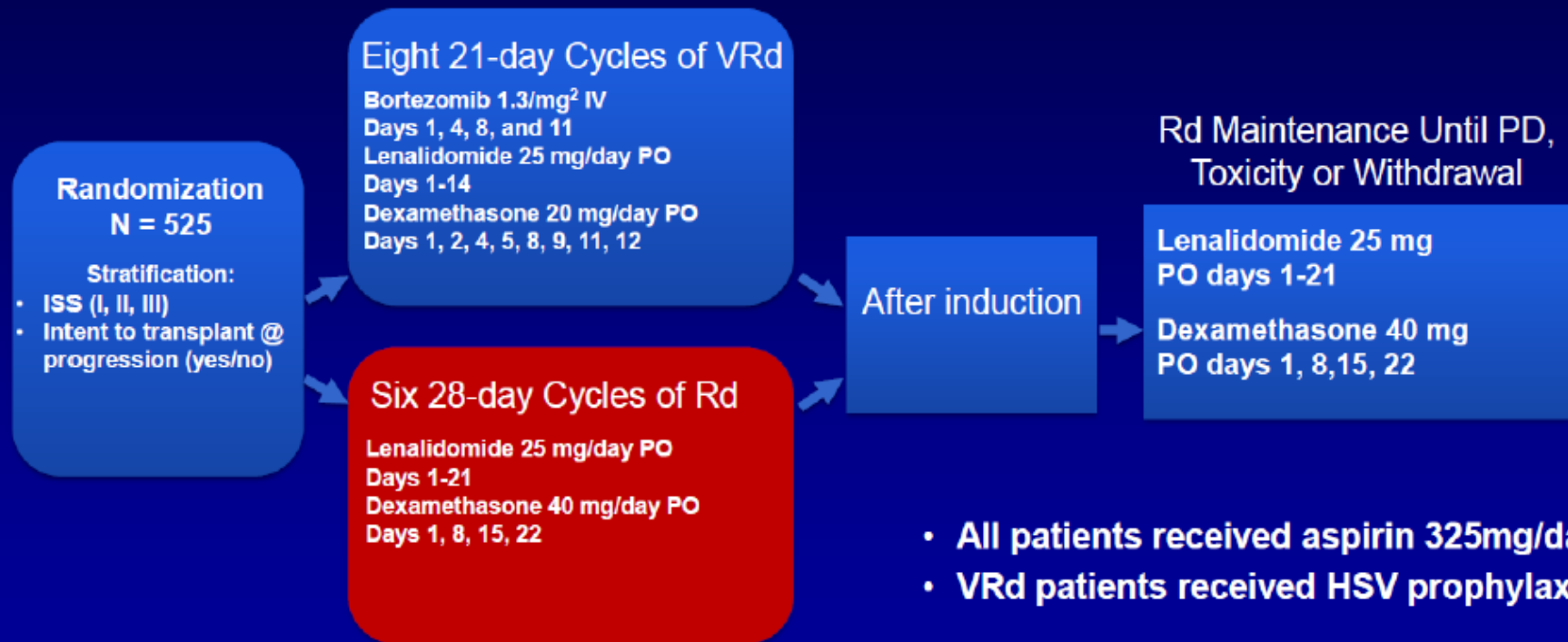
A systematic literature review and network meta-analysis of treatments for patients with untreated multiple myeloma not eligible for stem cell transplantation

The present NMA results indicate that the **Rd** regimen is a more effective treatment option for ndMM patients ineligible for transplantation compared with melphalan-containing regimens **VMP, MPT and MP**. These results reinforce the improved OS and PFS benefit reported for Rd directly compared with MPT.

Although no NMA was conducted on safety outcomes, the proportion of patients discontinuing treatment due to AEs and the reported grade 3/4 AEs from the 11 studies included in the sensitivity analysis was overall higher in triplet combinations compared with doublets.

In addition to favorable efficacy and safety parameters,[5] the Rd regimen has shown significant improvements in clinically relevant quality of life measurements,[43] which is of considerable value in the context of elderly patients with an incurable disease such as MM.

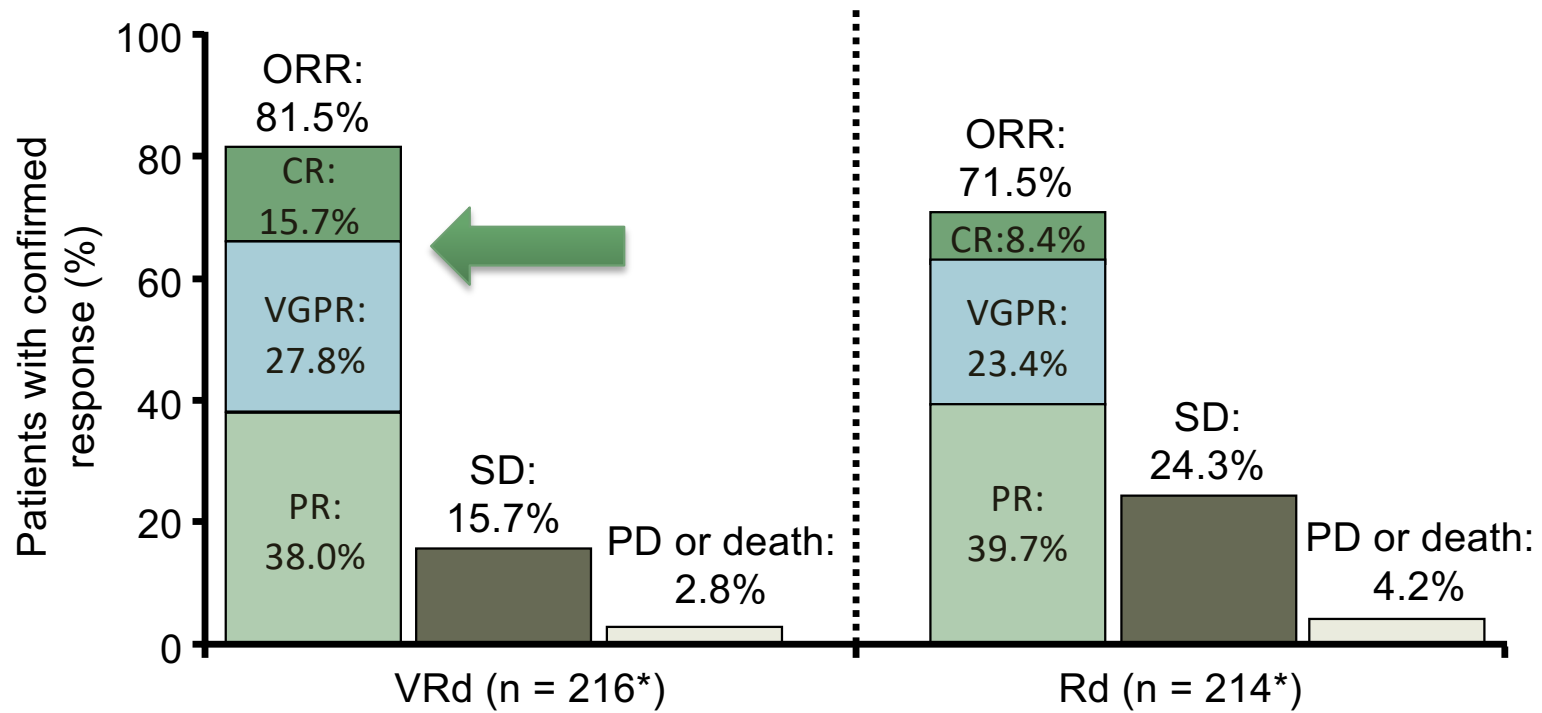
VRd vs Rd SWOG S0777: Study Design



HSV, herpes simplex virus; ISS, international staging system; PD, progressive disease; Rd, lenalidomide plus low dose dexamethasone; VRd, bortezomib, lenalidomide and dexamethasone.

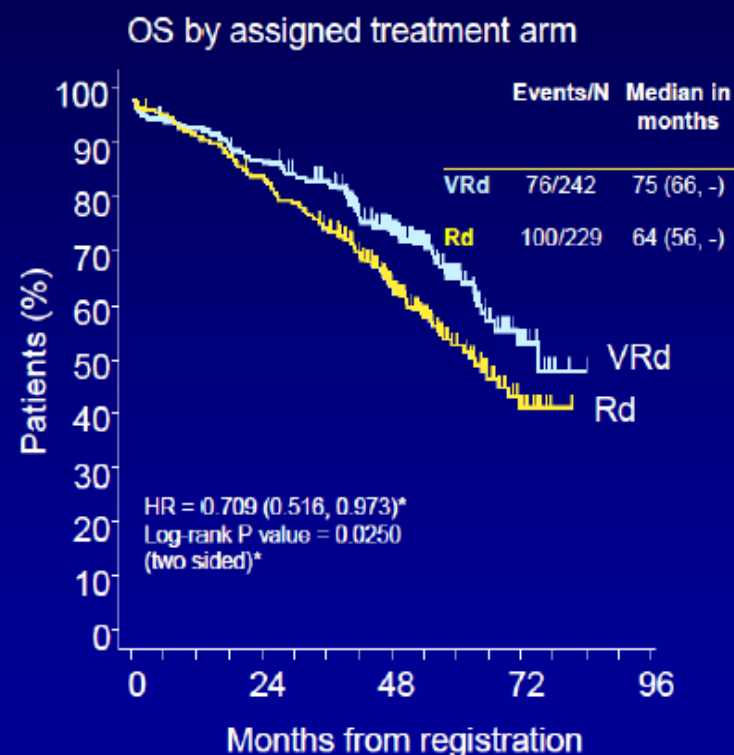
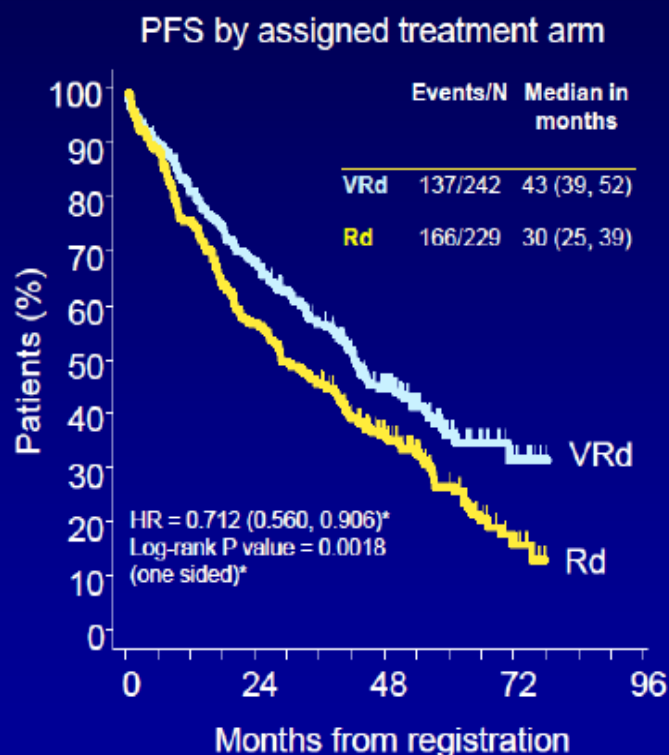
Durie et al. Lancet 2017;389:517-527

SWOG S0777 Study Design



*Assessable.

VRd vs Rd SWOG S0777 : PFS and OS by Assigned Treatment Arm



* Stratified

HR, hazard ratio; OS, overall survival; PFS progression free survival; Rd, lenalidomide plus low dose dexamethasone; VRd, bortezomib, lenalidomide and dexamethasone.

Durie et al. Lancet 2017;389:517-527

A Phase 2 Study of Modified Lenalidomide, Bortezomib, and Dexamethasone in Transplant-Ineligible Multiple Myeloma

Induction (cycles 1-9)

Repeat q35 days × 9 cycles

Lenalidomide 15 mg po days 1-21
 Bortezomib 1.3 mg/m² sc* days 1, 8, 15, 22
 Dexamethasone 20 mg po days 1, 2, 8, 9, 15, 16, 22, 23 (patients ≤75 years)
 Dexamethasone 20 mg po days 1, 8, 15, 22 (patients >75 years old)

Consolidation (cycles 10-15)

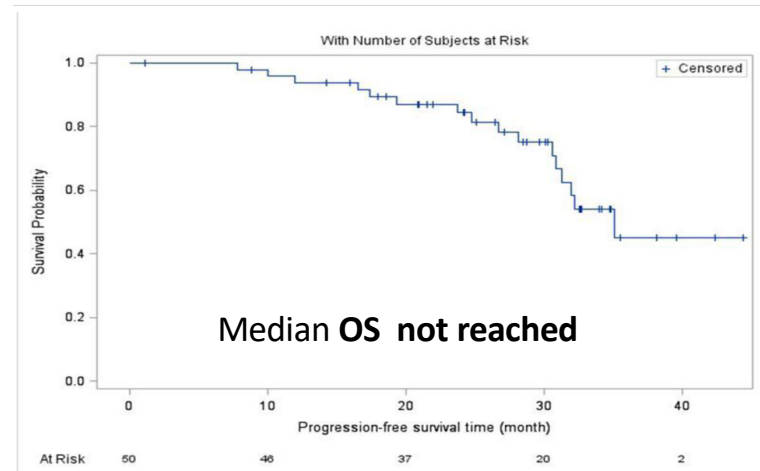
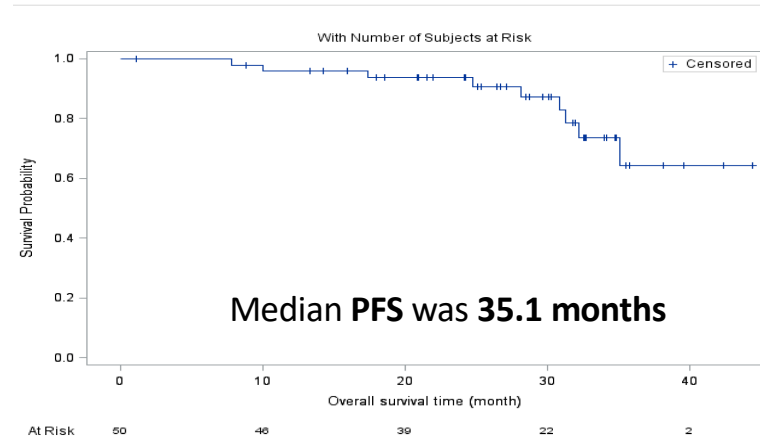
Repeat q28 days × 6 cycles

Lenalidomide 15 po days 1-21 (or last tolerated dose as of cycle 9)
 Bortezomib 1.3 mg/m² sc days 1, 15 (or last tolerated dose as of cycle 9)

Best Overall Response	N=50	%
Stringent Complete Response	6	12
Complete Response	16	32
Very Good Partial Response	11	22
Partial Response	10	20
Minimal Response	1	2
Stable Disease	3	6
Not Evaluable ^I	3	6
ORR	43	86
VGPR or better	33	66

^IReceived less than 4 cycles of therapy

median time to response was 1.1 months.



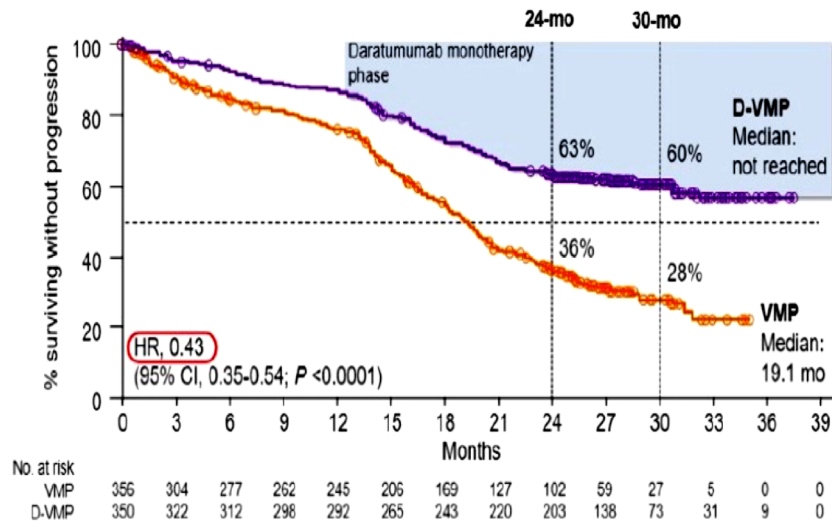
Cross-trial Comparisons: Transplant-ineligible NDMM

	VISTA		FIRST		SWOG S0777		VRd-Lite	ALCYONE		MAIA	
	VMP	MP	Rd	MPT	VRd	Rd	VRd-Lite	D-VMP	VMP	D-Rd	Rd
mFU, months	16.3		45		84		30	28		28	
mPFS, months	18	14	26	22	41	30	35	NR	19	NR	32
PFS HR (95% CI) p-value	0.61 (0.49-0.76) p=0.00001		0.69 (0.59-0.80) p<0.001		0.71 (0.56-0.91) ^d p=0.0018		NA	0.43 (0.35-0.54) p<0.0001		0.55 (0.43-0.72) p<0.0001	
ORR, %	74	39	81	67	90	72	86	91	74	93	81
≥VGPR	41	8	48	30	75	32	66	73	50	79	53
≥ CR	33	4	21	12	24	8	44	45	25	48	25
MRD-neg rate (10⁻⁶), %	NA	NA	NA	NA	NA	NA	NA	27	7	24	7
mOS, months	56.4 ^e	43.1	59.1	49.1	NR	64	NR	NR	NR	NR	NR
OS HR (95% IC) P value	0.69 P = 0.0004		0.78 (0.67-0.92) p=0.0023		0.70 (0.52-0.96) p=0.01		NA	NA		0.78 (0.56-1.1)	

Dara goes to first line: initially in the elderly patients

ALCYONE study: updated PFS

Median (range) follow-up: 27.8 (0-39.2) months

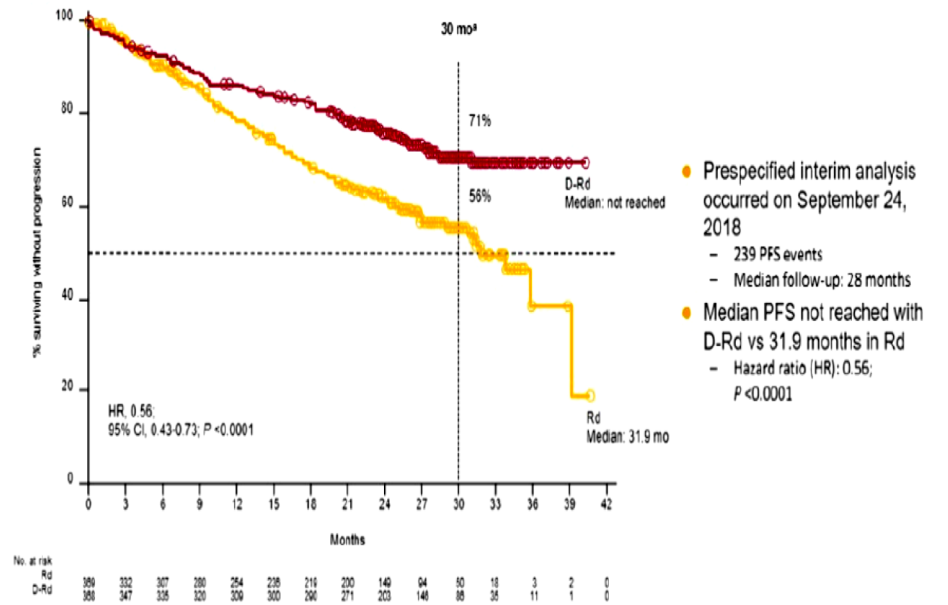


HR, hazard ratio; CI, confidence interval; *Kaplan-Meier estimate; PFS, progression-free survival; HR, hazard ratio; mo, months; D, daratumumab; V, bortezomib; M, melphalan; P, prednisone; CI, confidence interval; mo, months.

Meletios A. Dimopoulos, CD38 targeted treatment of MM, oral presentation, 17th IMW, Boston 2019; MA Dimopoulos et al., ASH 2018 Annual Meeting, abstract #156.

Dara goes to first line: initially in the elderly patients

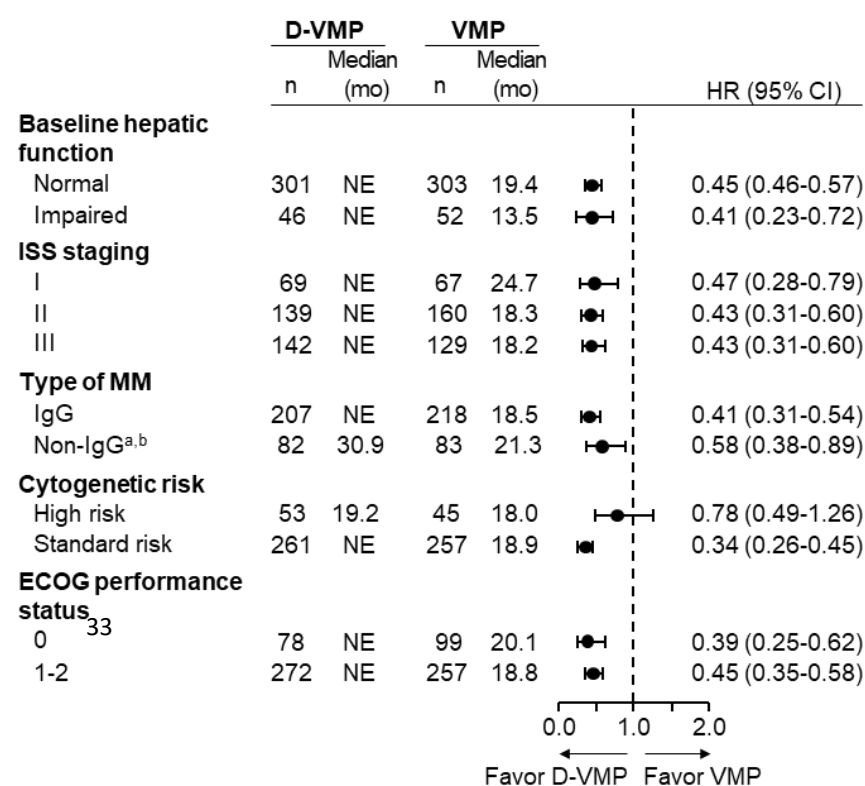
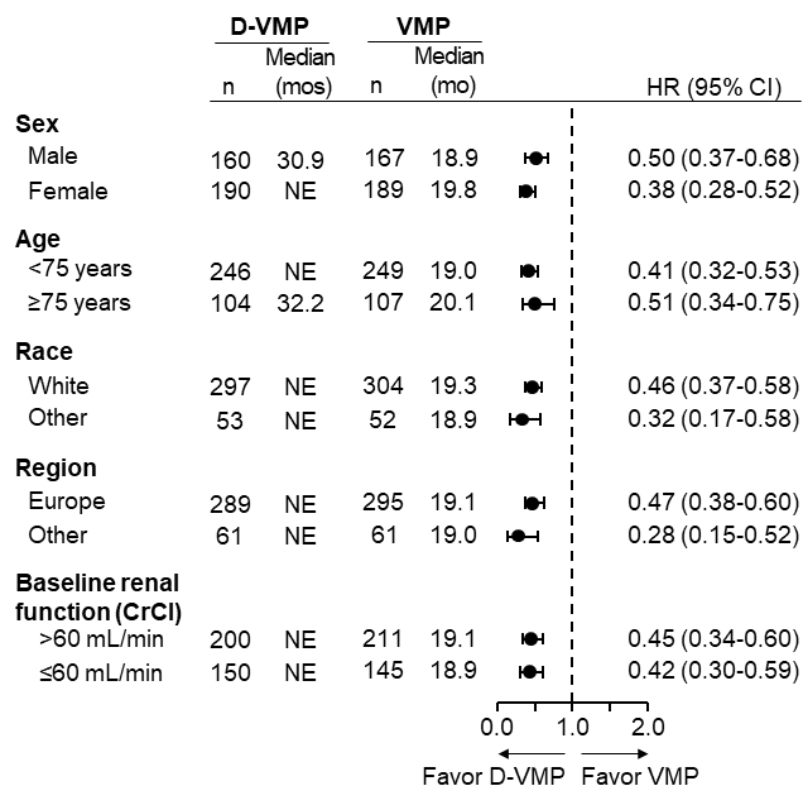
MAIA study: updated PFS



HR, hazard ratio; CI, confidence interval; *Kaplan-Meier estimate; PFS, progression-free survival.

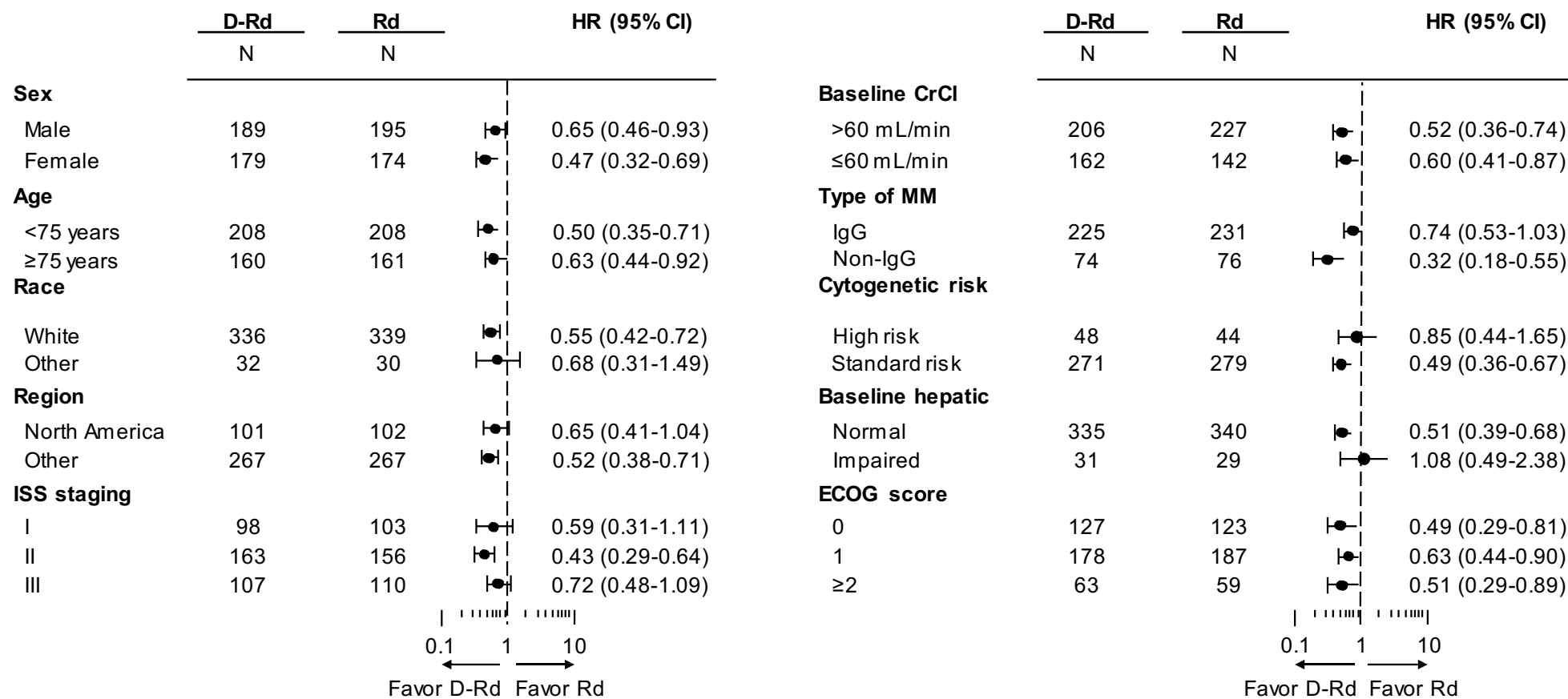
Meletios A. Dimopoulos, CD38 targeted treatment of MM, oral presentation, 17th IMW, Boston 2019; T Facon et al., N Engl J Med 2019; 380:2104-5.

Efficacy: PFS in Prespecified Subgroups



D-VMP prolonged PFS across all subgroups

Efficacy: PFS in Prespecified Subgroups

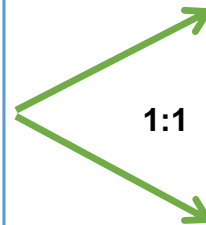


D-Rd significantly reduced the risk of progression or death across the majority of subgroups

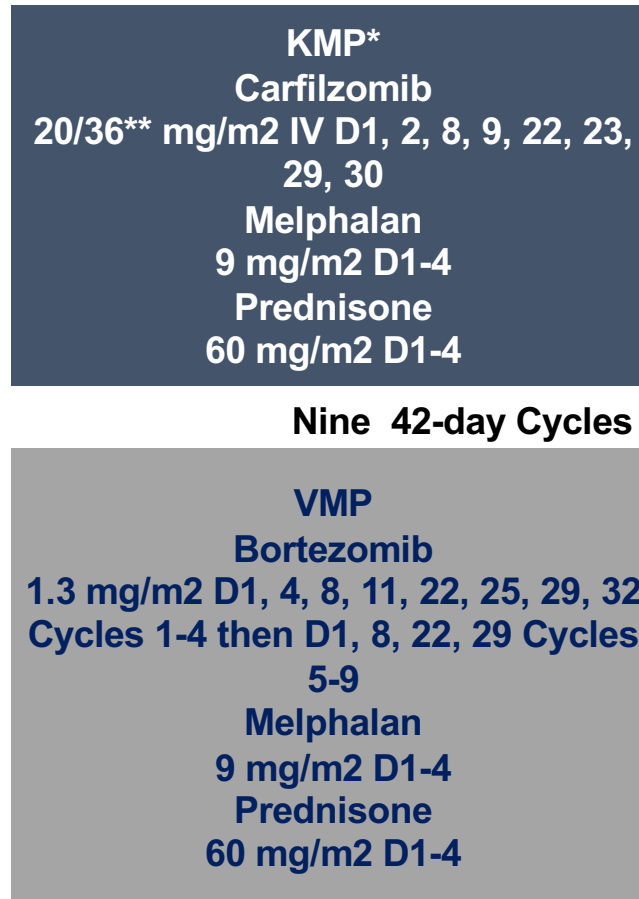
CLARION: Phase 3 Carfilzomib, Melphalan, Prednisone (KMP) vs. Bortezomib, Melphalan, Prednisone (VMP) in Newly Diagnosed MM

Study Population

Newly Diagnosed MM (N = 882)
Transplant-ineligible
≥ 18 years of age
LVEF ≥ 40%



Primary endpoint: PFS
Secondary endpoint: OS, ORR,
DOR, safety, HR-QOL



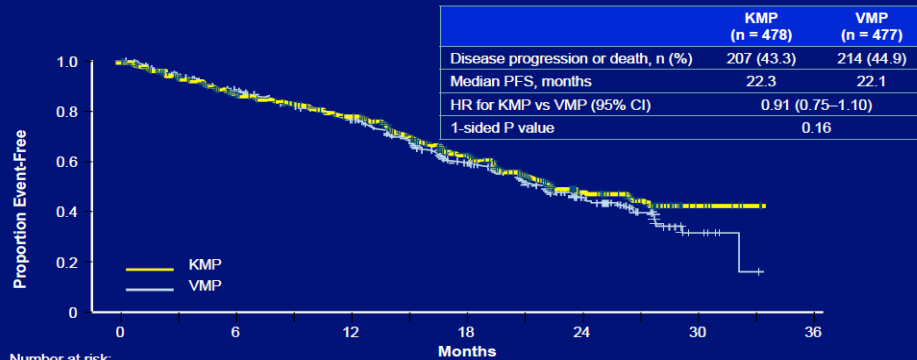
*Dexamethasone 4 mg given on Days 8, 9, 22, 23, 29, 30 in Cycle 1

** 20 mg/m² on Day 1, 2 of Cycle 1; then 36 mg/m² on all subsequent days and cycles

CLARION STUDY

Primary Endpoint: Progression-Free Survival

- Median follow-up time: 22.2 months for KMP and 21.6 months for VMP
- The absence of PFS difference was consistent across subgroups



Number at risk:

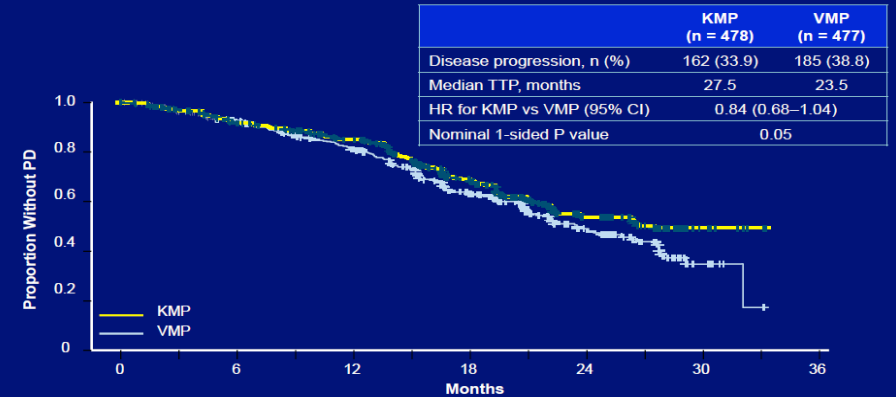
	0	6	12	18	24	30	36
KMP	478	384	327	217	85	15	0
VMP	477	367	309	202	77	9	0

CI, confidence interval; HR, hazard ratio; KMP, carfilzomib, melphalan, prednisone; PFS, progression-free survival; VMP, bortezomib, melphalan, prednisone

Facon T, et al. Presented at: 16th International Myeloma Workshop, New Delhi, India, March 1-4, 2017.

CLARION STUDY

Time to Progression



Number at risk:

	0	6	12	18	24	30	36
KMP	478	380	326	216	84	15	0
VMP	477	367	308	202	77	9	0

CI, confidence interval; HR, hazard ratio; KMP, carfilzomib, melphalan, prednisone; PD, progressive disease; TTP, time to progression; VMP, bortezomib, melphalan, prednisone

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CLARION STUDY

AEs of Interest

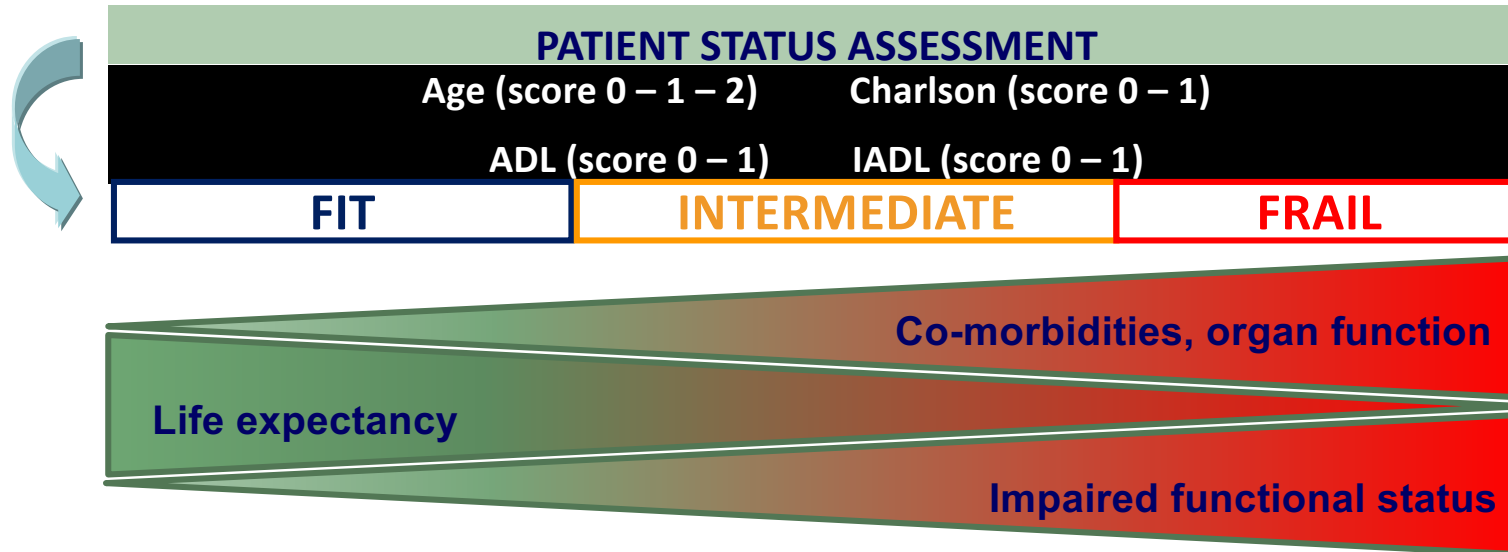
AE, %	KMP (n = 474)		VMP (n = 470)	
	All Grade	Grade ≥ 3	All Grade	Grade ≥ 3
Acute renal failure ^a	13.9	7.4	6.2	2.1
Cardiac failure ^a	10.8	8.2	4.3	2.8
Ischemic heart disease ^a	3.0	2.1	1.9	1.3
Hypertension ^a	24.7	10.1	8.1	3.6
Dyspnea ^b	18.1	3.6	8.5	0.6
Grade 5 AE	6.5		4.3	
Leading to treatment discontinuation	17.5		15.5	

^aStandardized MedDRA Queries Narrow Search, ^bhigh-level term

AE, adverse event; KMP, carfilzomib, melphalan, prednisone; MedDRA, Medical Dictionary for Regulatory Activities; VMP, bortezomib, melphalan, prednisone

Facon T, et al. Presented at: 16th International Myeloma Workshop, New Delhi, India, March 1-4, 2017.

Treatment goals in elderly MM based on frailty



Deep remission

Goal

CR/MRD-negativity

Priority

Efficacy



Balance efficacy/safety

Good response

Combination of efficacy/safety



Do not harm

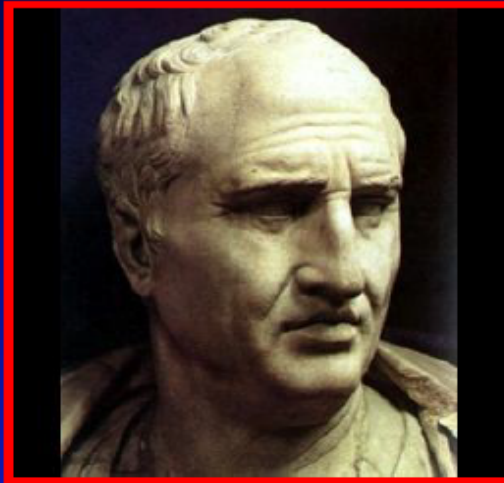
QoL

Low toxicity

CONCLUSIONS

- ✓ VMP and Rd are still the two milestones of the first line treatment of MM patients not eligible to transplant
- ✓ VRD seems to be the best choice in fit elderly patients giving very good results with an acceptable toxicity
- ✓ Carfilzomib based schemes can be adopted in fit elderly patients with caution adjusting doses and schedules
- ✓ Dara- based combinations will completely change the scenario
- ✓ *Respice senectute*
- ✓ Although a frailty evaluation balancing the efficacy and tolerability is crucial in the treatment choice in this setting this do not justify a **forgoing attitude** in elderly patients

**NEMO EST TAM SENEX
QUI SE ANNUM NON PUTET POSSE VIVERE**



(Cicero, De Senectute, VII, 24)



Thanks for
the
attention