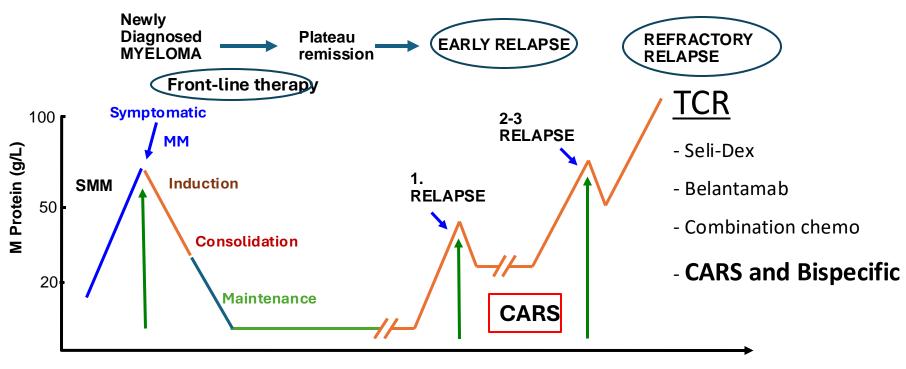
Sequencing of Therapies for Multiple Myeloma

Thomas Martin, MD
Helen Diller Family Comprehensive Cancer Center
UCSF Medical Center
San Francisco, California



Sequencing Therapy in MM:

How should we sequence all these agents?





Triplets: VRd/KRd

Quads: CD38 + VRd/KRd

Early Relapse

(1-3 Prior Line): Triplets CAR T-cell

Late Relapse

Recycle agents, Immunotherapy



AGENTS APPROVED for MULTIPLE MYELOMA

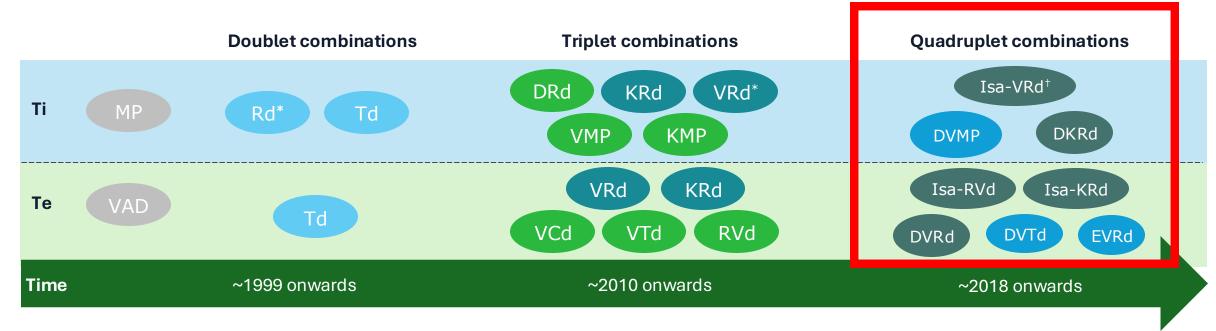
Proteasome Inhibitors	IMiDs	Alkylating Agents	Monoclonal Antibodies	Targeted Agents	Bispecific Antibodies	CAR T-cells BCMA-directed
Bortezomib	Lenalidomide	Melphalan	Daratumumab	Selinexor	Teclistamab	Idecabtagene vicleucel
Carfilzomib	Pomalidomide	Doxorubicin (liposomal)	Isatuximab	Venetoclax	Elranatamab	Ciltacabtagene autoleucel
lxazomib	Thalidomide	Cyclophospha mide	Elotuzumab		Talquetamab	
		PACE/CVAD				

Almost an infinite # of combinations of these agents: with the inclusion of corticosteroids in all (Dex)

Where and When to use these agents → Sequencing

Options for initial myeloma treatment have evolved significantly over time

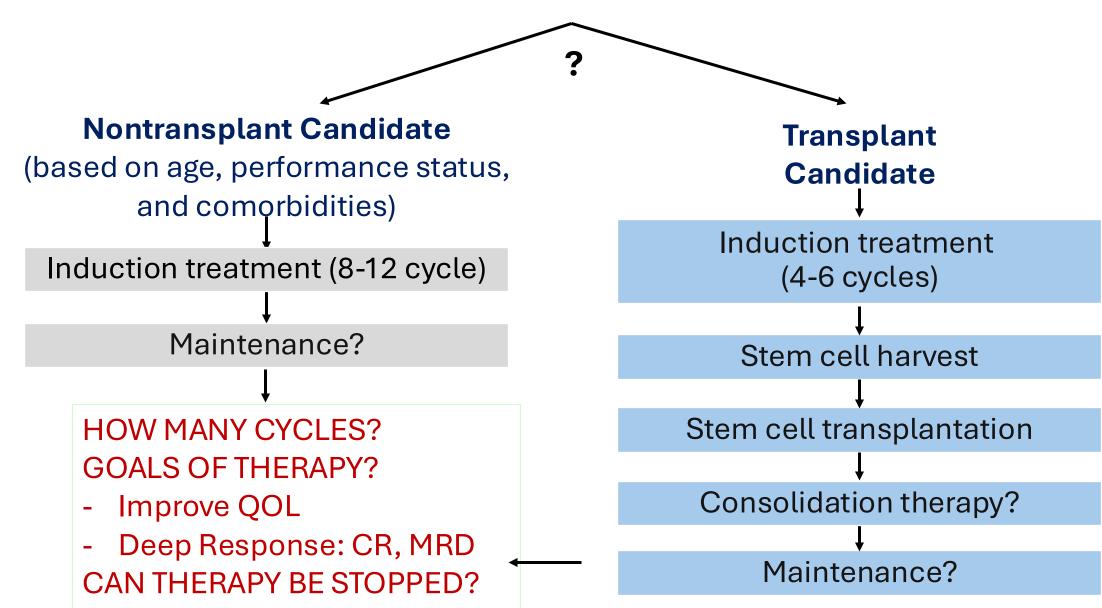
Therapeutic regimens explored in Phase III NDMM trials over time¹⁻⁴



^{*}Including transplant-deferred. †Twice-weekly and once-weekly V dosing are being explored in the IMROZ and BENEFIT studies, respectively

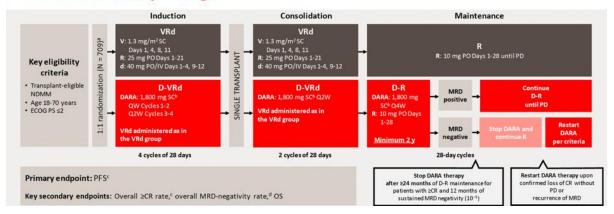
The emergence of newer agents and novel combination treatment strategies has improved patient outcomes

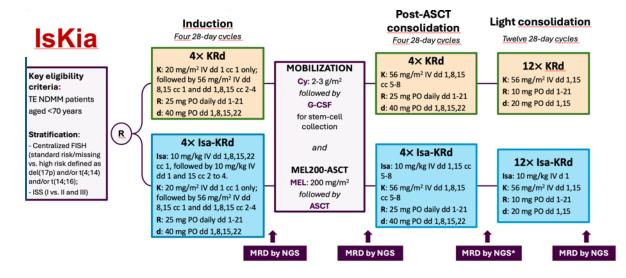
Initial Approach to Treatment of Myeloma



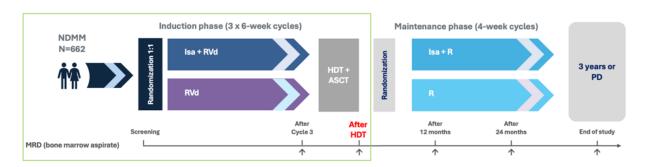
Frontline for TE: Quads vs. Triplets (CD38 for ALL?)

PERSEUS: Study Design





GMMG-HD7 interim analysis: MRD negativity after HDT + ASCT (intensification)

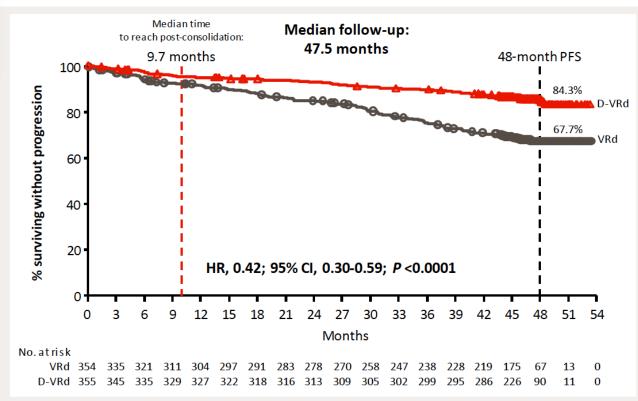


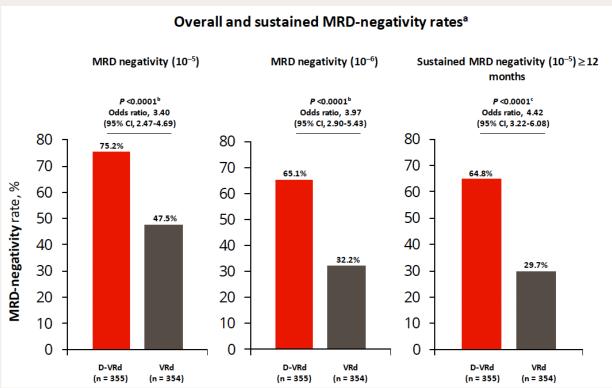
GMMG CONCEPT TRIAL: Study Design



Sonneveld P, et al. EHA 2024; Raab M, et al. EHA 2024; Gay F, et al. ASH 2023; Leypoldt LB, et al, IMS 2023

PERSEUS Primary Analysis: D-VRd Followed by D-R Maintenance Significantly Improved PFS and Depth of Response Versus VRd Followed by R Maintenance¹

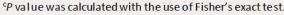




58% reduction in the risk of progression or death in patients receiving D-VRd

Deep and durable MRD negativity achieved with D-VRd

HR, hazard ratio; CI, confidence interval. aMRD-negativity rate was defined as the proportion of patients who a chieved both MRD negativity and ≥CR. MRD was assessed using bone marrow aspirates and evaluated via NGS (clonoSEQ asserts ion 2.0; Adaptive Biotechnologies, Seattle, WA, USA). P values were calculated with the use of the stratified Cochran—Mantel—Haenszel chi-square test.



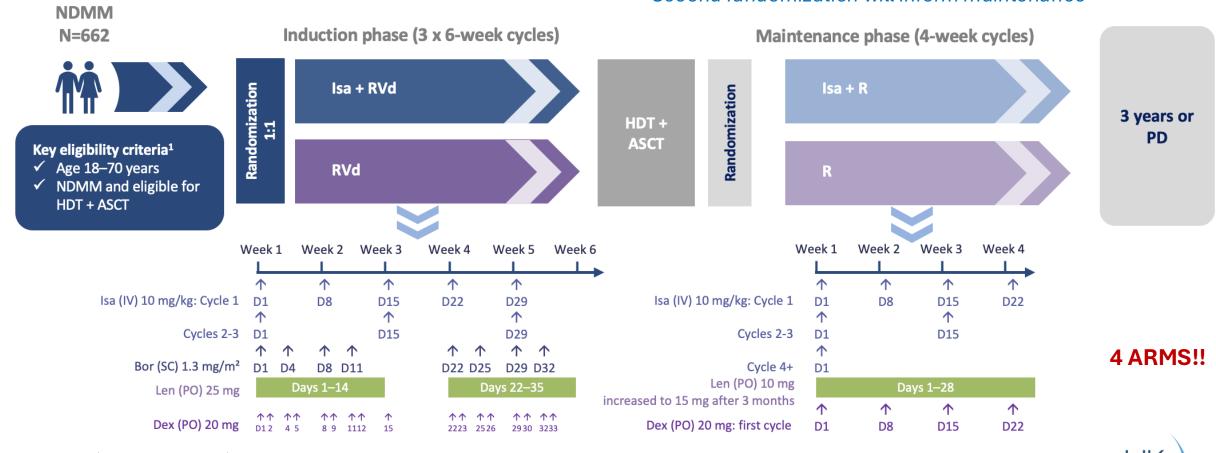
^{1.} Sonneveld P, et al. N Engl J Med. 2024;390(4):301-313.





GMMG-HD7: The first phase 3 study evaluating Isa + RVd for induction and maintenance in patients with Te NDMM

Second randomization will inform maintenance

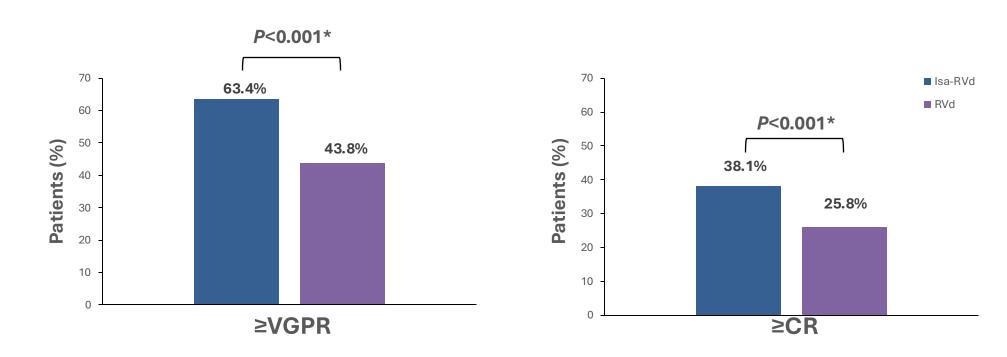


**Primary Endpoint: MRD (-); Secondary PFS



GMMG-HD7 interim analysis: MRD negativity by NGF (10⁻⁵) after intensification (ITT; by response)

Patients with MRD negativity and indicated response status



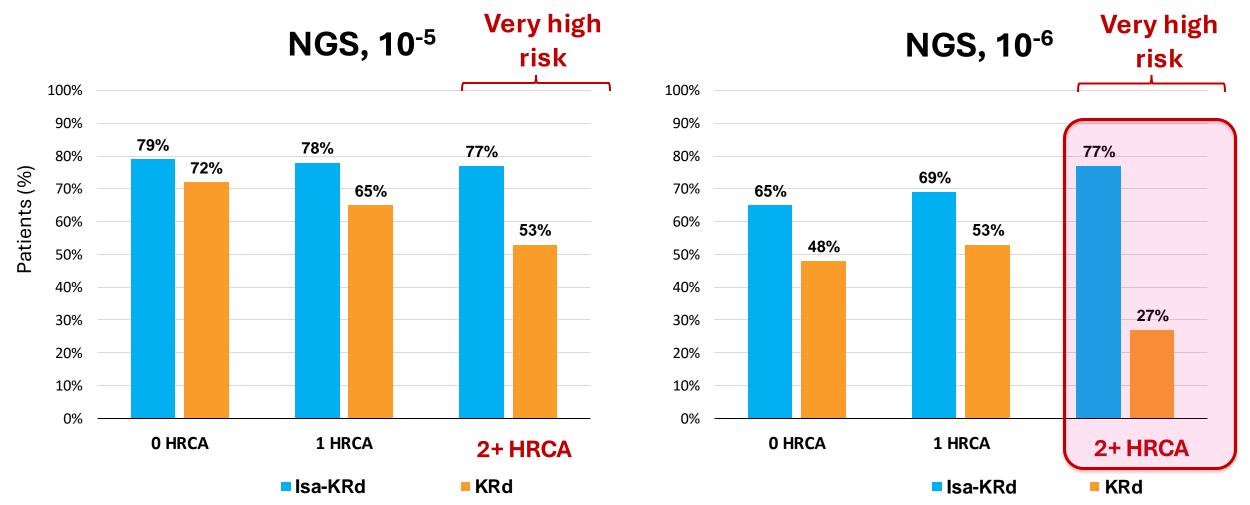
Isa-RVd led to significantly higher MRD negativity/VGPR and MRD negativity/CR rates (per IMWG) compared with RVd after intensification

^{*}P value derived from stratified conditional logistic regression analysis.

CR, complete response; d, dexamethasone; lsa, isatuximab; ITT, intent to treat; MRD, minimal residual disease; NGF, next-generation flow; R, lenalidomide; V, bortezomib; VGPR, very good partial response.

IsKia - Post-consolidation MRD negativity by NGS

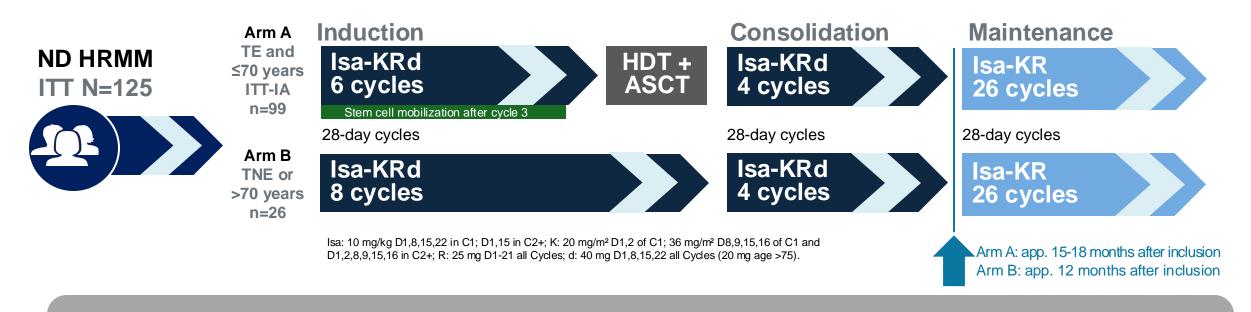
Subgroup analysis by cytogenetic risk



1 HRCA was defined as the presence of one of the following high-risk cytogenetic abnormalities: del(17p13.1), t(4;14) (p16.3;q32.3), t(14;16) (q32.3;q23), gain(1q21), or amp(1q21); 2+ HRCA was defined as the presence of at least two high-risk cytogenetic abnormalities.

Is K better than V in HRMM

GMMG CONCEPT TRIAL: Study Design



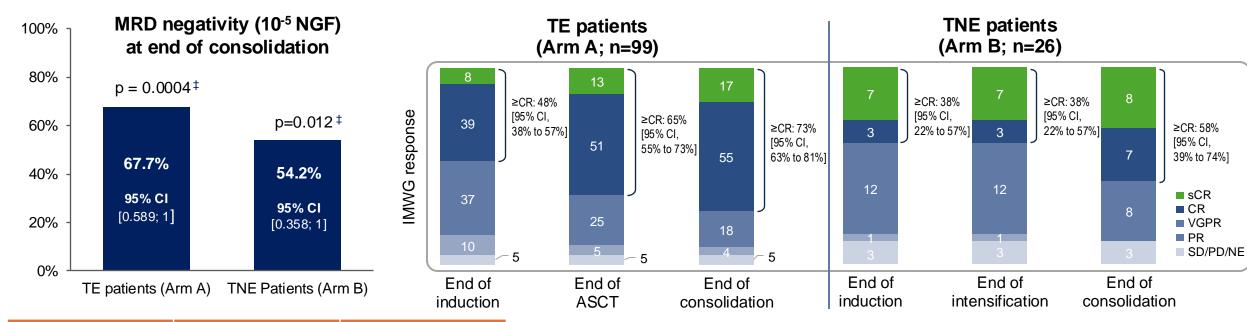
HRMM criteria: ISS stage II or III **PLUS** ≥1 of: del(17p), t(4;14), t(14;16) and/or >3 copies 1q21 (amp1q21)

Primary objective: MRD negativity after consolidation (NGF, 10⁻⁵) Secondary objective: PFS; Key tertiary objectives: ORR, OS, safety

HR: Focus has been on duration of therapy and #of agents

Leypoldt LB, et al, IMS 2023

CONCEPT Trial: MRD Negativity and IMWG Response



MRD status, n (%)	TE patients (Arm A) (n=93*)	TNE patients (Arm B) (n=24 [†])
Negative	63 (67.7)	13 (54.2)
Positive	3 (3.2)	0 (0)
Not done/missing	2 (2.2)	0 (0)
Time point not reached	25 (27.0)	11 (45.8)

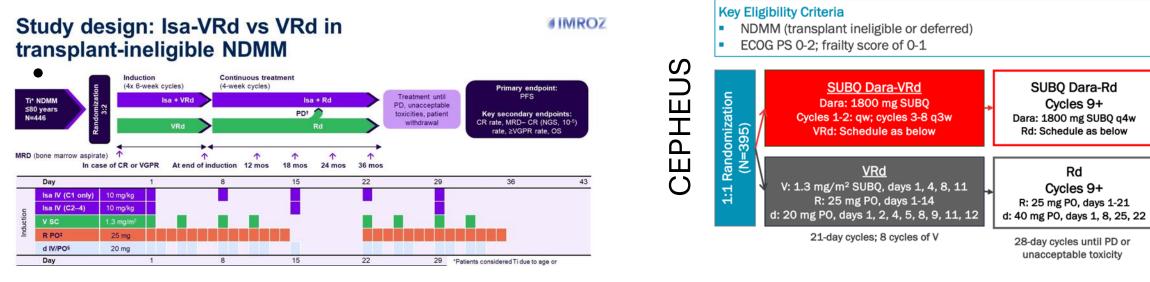
6 TE and 2 TNE patients were not assessable

Footnotes

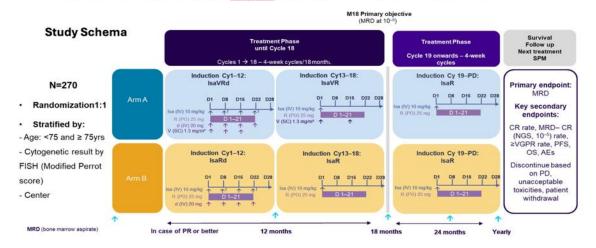
- The trial met its primary endpoint with MRD negativity rates of 67.7% (TE) and 54.2% (TNE) at the end of consolidation
- Responses deepened over time with ≥CR-rates of 72.7% (TE) and 57.7% (TNE) as best response

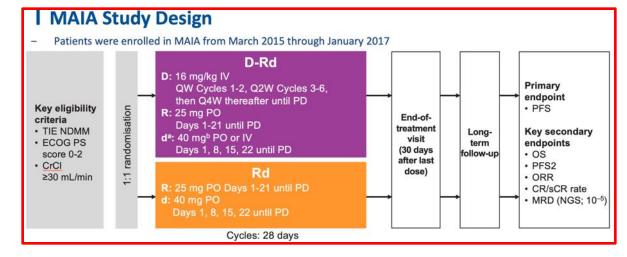
Leypoldt LB, et al, IMS 2023

Frontline for TI: Quads vs. Triplets (CD38 for ALL?)



BENEFIT Trial: Isa-VRd vs. Isa-RD in TI NDMM



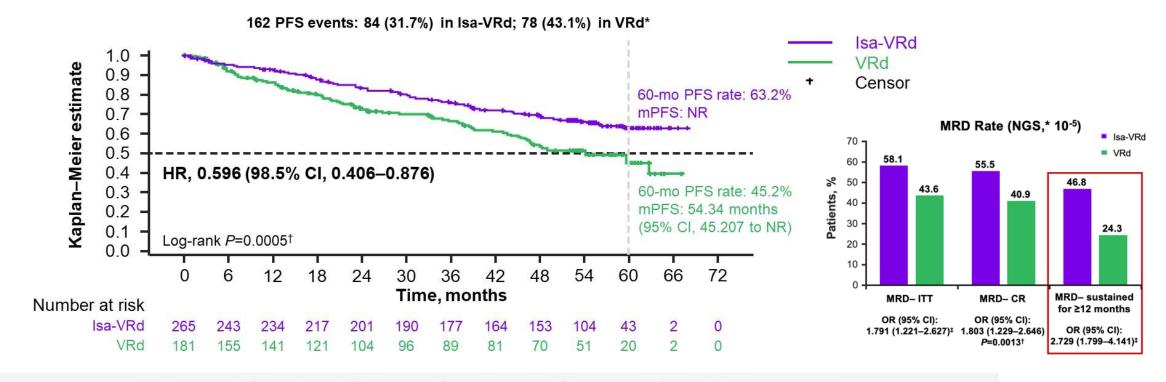


Facon T, et al. EHA 2024; LeLeu X, et al. EHA 2024; Facon T, et al. EHA 2024; Usmani S, et al. IMS 2024

Primary endpoint met: Interim PFS analysis-IRC assessment in ITT population



Isa-VRd vs. VRd



At a median follow-up of 5 years (59.7 months), Isa-VRd followed by Isa-Rd led to a statistically significant reduction in the risk of progression or death by 40.4%

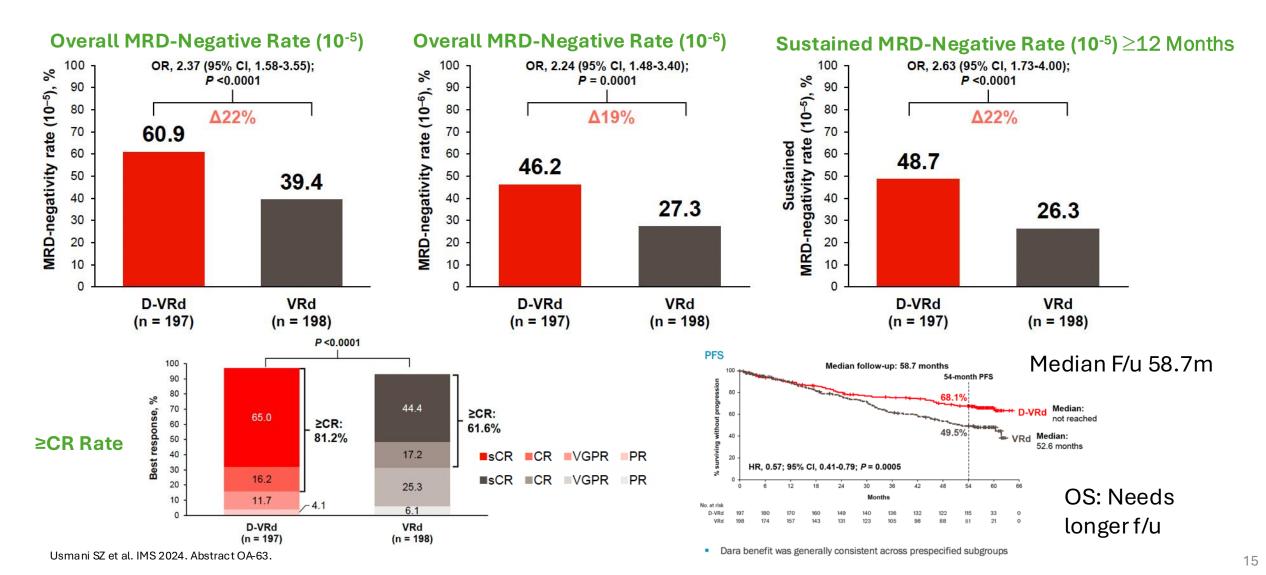
*Cutoff date for PFS analysis: September 26, 2023 (median follow-up, ~5 years). †Nominal one-sided P value NR. not reached.





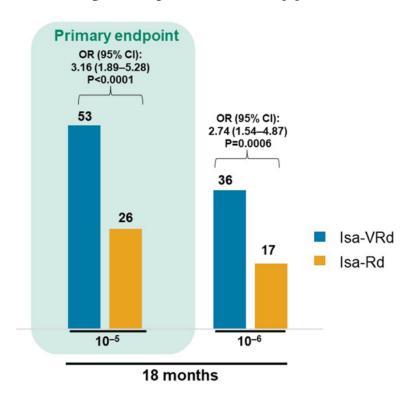


CEPHEUS Phase 3 Study of SUBQ Dara-VRd vs VRd in TI or –Deferred Patients With NDMM: MRD-Negative and Response Rates

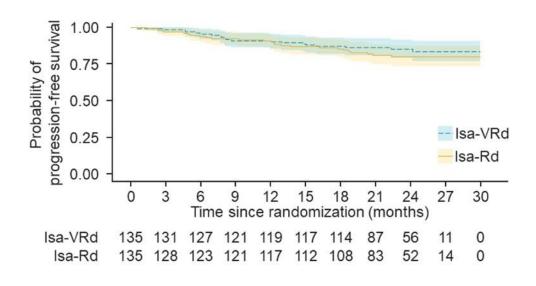


BENEFIT Trial: Isa-VRd vs. Isa-RD in TI NDMM

Results: Primary Endpoint MRD(-)



Preliminary PFS (Median F/U 23.5 mos)



Estimated 24 months PFS

85.2% (95%Cl 79.2–91.7) for Isa-VRd 80.0% (95% Cl 73.3–87.4) for Isa-Rd

Isa-VRd resulted in deep response rates, particularly MRD(-) at 18 months and PFS is still immature

*MRD was assessed on the basis of IMWG recommendations.¹
CI, confidence interval; CR, complete response; Isa, is saturalized assuments; ITT, intent-to-treat; MRD—, minimal residual disease negativity; NGS, next generation sequencing; OR, odd ratio; R, lenalidomide; V, bortezomit; I, Kumart, S, et al. / anget Oppol 2016; 17: 4238—436



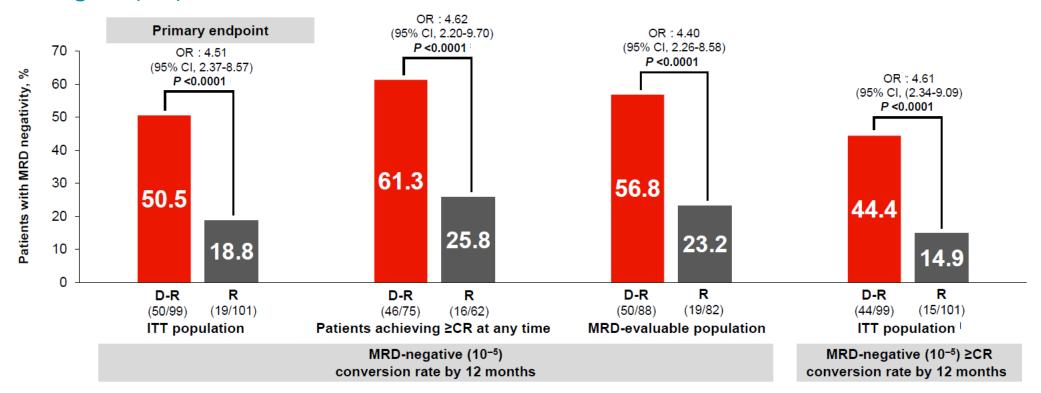




Maintenance: AURIGA Phase 3 Study of SUBQ Dara-R vs R Post Transplant

Results From Maintenance: MRD

MRD-Negative (10⁻⁵) Conversion Rates From Baseline to 12 Months of Maintenance Treatment



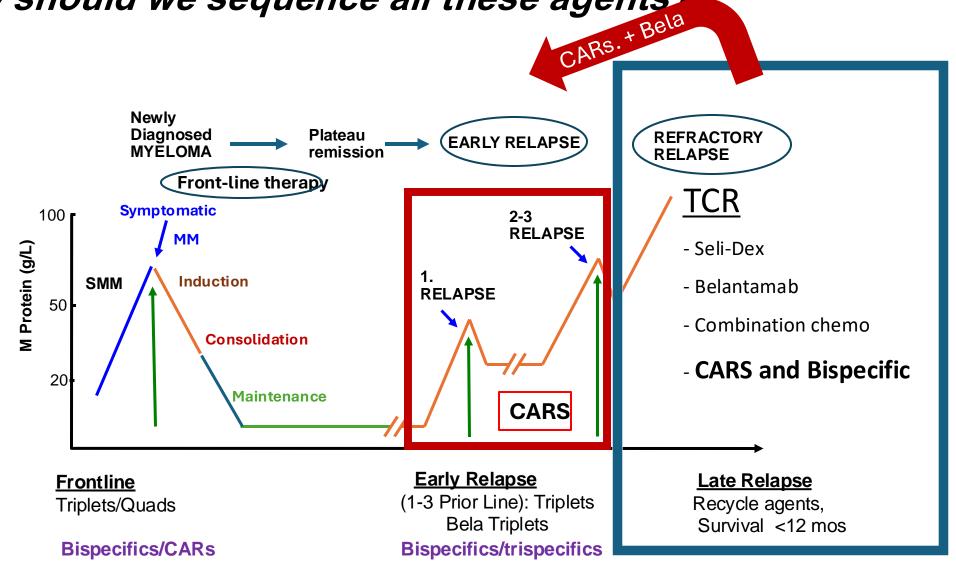
• MRD-negative (10⁻⁵) conversion rates by 12 months were improved with Dara-R vs R across all clinically relevant subgroups

Conclusions for NDMM

- CD38 + VRd (QUAD therapy) appears to be new SOC for TE and TI NDMM
- Results appear durable both in TE and TI projected PFS >80-90 months
- In TI, (BENEFIT) QWk bortezomib appears well-tolerated and effective
 - Unclear in TE
- High-risk NDMM appears to benefit from QUAD therapy
 - Dara-VRd subgroup looks good need prolonged maintenance
 - Isa-KRd shows improved MRD- rates, especially in double hit subgroup
- MRD(–) CR will be the new "early" response metric for future trials
- CD38 in induction and maintenance appears important.
- Treatment adapted trials based on MRD, are needed to help guide treatment duration
- Will CART and bispecifics show even better results (response and TF)?

Sequencing Therapy in MM after Front-Line: How should we sequence all these agents?

Trials:

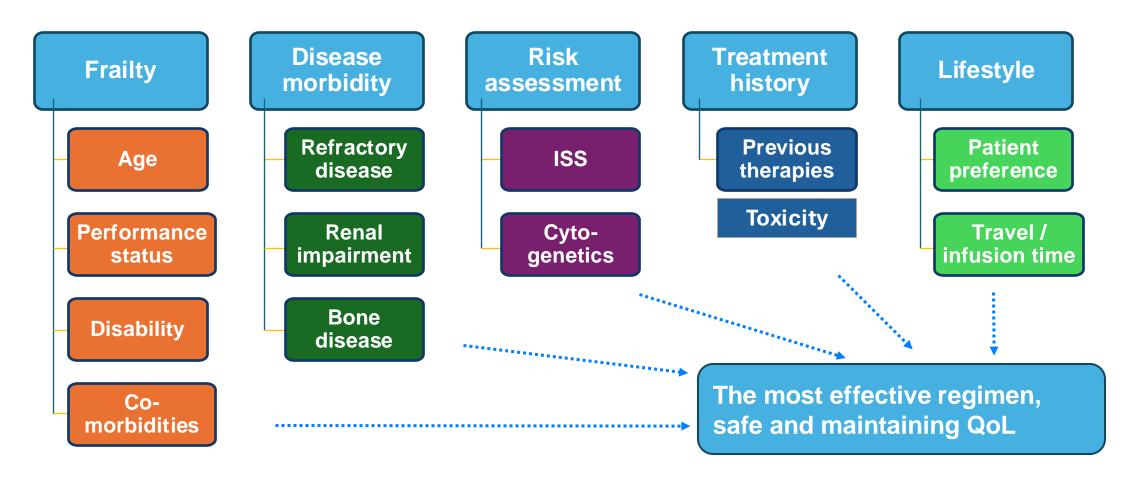


Therapy: Approved and Experimental Products Competitive Landscape for Triple Class Exposed/Refractory MM

Novel Drugs	Novel Monoclonal Antibodies	ADCs	BCMA Bispecifics	Cellular Therapies BCMA CARs
Iberdomide, Mezigdomide	SAR442085 Hexabody-CD38 TAK-079	Belantamab mafodotin	Teclistamab Elranatamab	Idecabtagene vicleucel Ciltacabtagene-autoleucel
Selinexor Venetoclax	TAK-573 AMG-424 GBR-1343	CC-99712	ABBV-383 Linvoseltamab	Lummicar (CT053) Anitocabtagene FasT CAR (CD19/BCMA)
CFT7455	<u>Immune – Toxin</u> TAK-169 SEA-BCMA	AZD0305	Non-BCMA Cevostamab Talquetamab	Allo-CAR NK-CAR

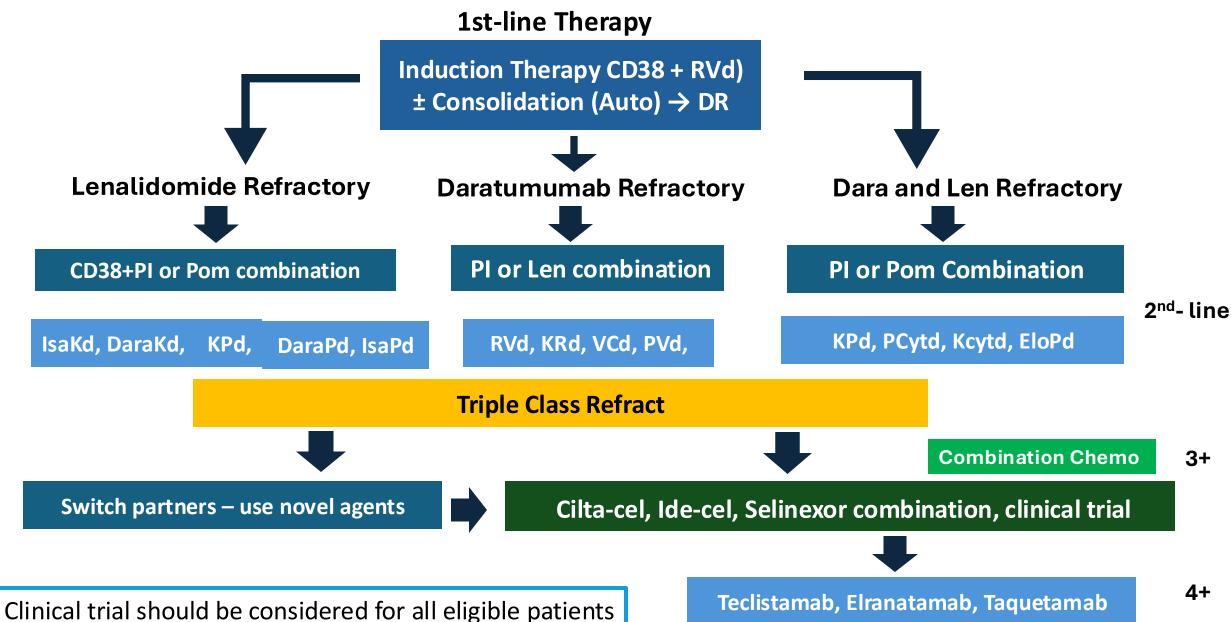


Disease and Patient Factors Influence Treatment Choices in Relapsed Refractory MM

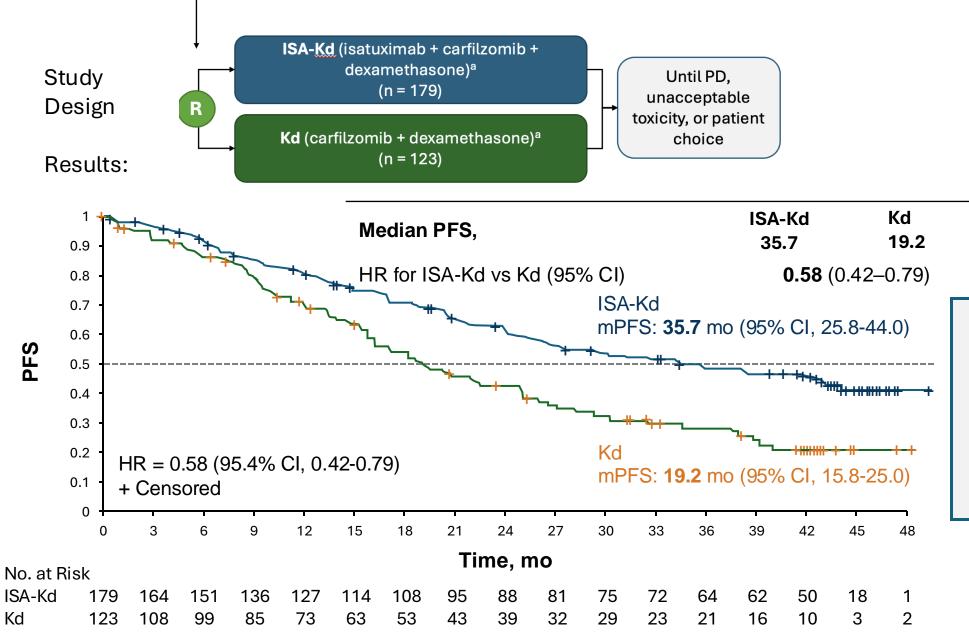


^{*}Attrition should be a consideration! With each line of therapy, 20-40% don't proceed to the next line.

Sequencing Therapy for Patients With R/R MM



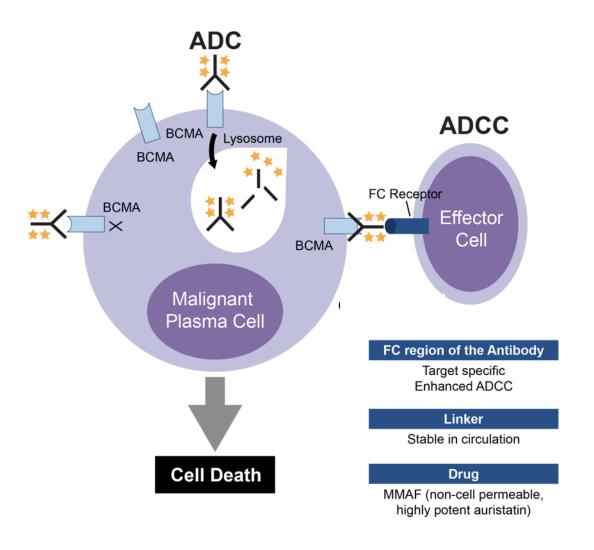
IKEMA: Randomized Phase3 Trial in RRMM 1-3 PLT



ISA-Kd showed
the longest PFS on a
PI-based backbone
in RRMM, with 42%
reduction vs Kd in the
risk of progression
or death

Analysis of OS is planned for 2023

Antibody-drug conjugate (ADC) - Belantamab

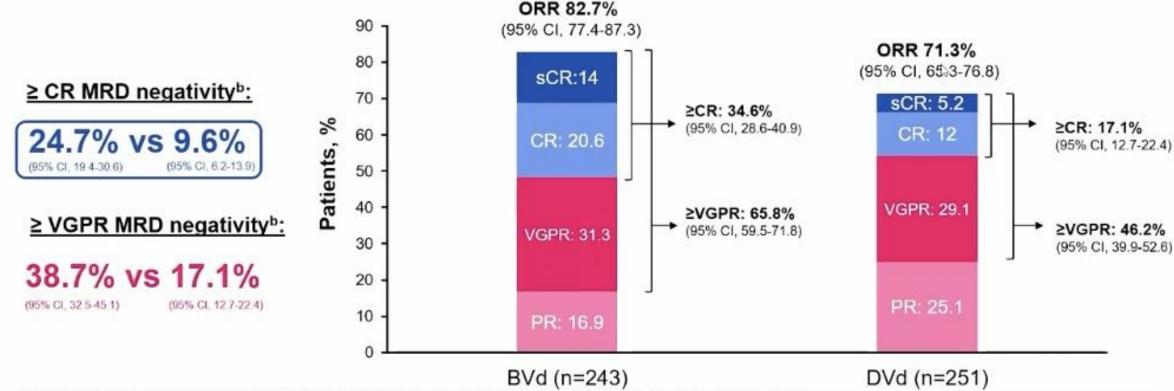


- Belantamab mafodotin is a humanized, afucosylated IgG1 anti-BCMA antibody conjugated to monomethyl auristatin (MMAF)
- <u>FDA approved</u> for patients previously treated with 4 *prior therapies* then withdrawn due to failed P3 trial B vs. Pd.
- DREAMM 7 Phase 3: 494 patients
 - Randomized: BVd vs. DVd RRMM 1-3 PLT
- DREAMM 8 Phase 3:
 - Randomized P3: BPd vs. PVd

Single agent activity in RRMM => ORR 32%

Comeback-Kid of the year!!

DREAMM-7: deeper responses with BVd vs DVda



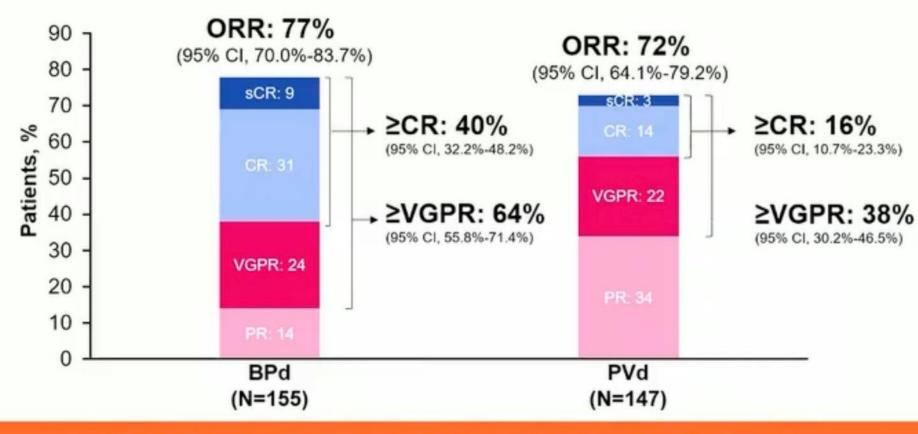
Hungria V, et al. N Engl J Med. 2024; doi: 10.1056/NEJMoa2405090. Copyright © 2024 Massachusetts Medical Society. Reprinted with permission from Massachusetts Medical Society.

BVd was associated with a greater depth of response with double the ≥CR rate and more than double the MRD negativity rates (sensitivity of 10⁻⁵) of DVd (*P* value <.00001)^c

BVd, belantamab mafodotin, bortezomib, and dexamethasone; CR, complete response; DVd, daratumumab, bortezomib, and dexamethasone; ITT, intent to treat; MRD, minimal residual disease, NGS, nextgeneration sequencing, PR, partial response; R-ISS, Revised International Staging System; sCR, stringent complete response; VGPR, very good partial response.

*CIs were based on the exact method. Two patients in the ITT population were randomized, not treated, rescreened, and rerandomized. They are counted as 4 unique patients in this output. *MRD negativity rate was defined as percentage of patients who were MRD negative by NGS based on a sensitivity of 10-5. *Nominal P value. Cochran—Mantel—Haenszel test was used and adjusted for stratification factors, including number of prior lines of therapy (1 vs 2 or 3 vs ≥4), prior bortezomib, and R-ISS stage at screening (I vs II or III).

Deeper Responses With BPd vs PVd



The CR or better rate in the BPd arm was more than twice that in the PVd arm

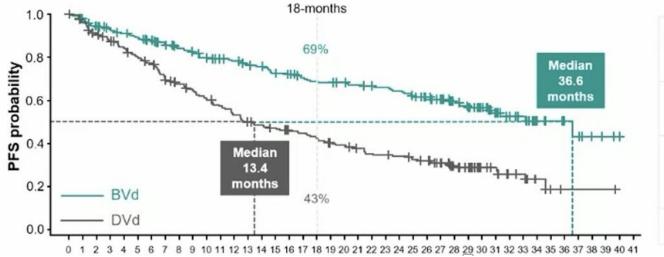
From Dimopoulos M. et al. N Engl J Med. 2024, doi: 10.1056/NEJMoa2403407. Copyright © 2024 Massachusetts Medical Society. Reprinted with permission from Massachusetts Medical Society.

Both DreaMM-7 and -8 Show Significant PFS Benefit – No Blurriness Here

DREAMM

7

Mateous et al. EHA2024

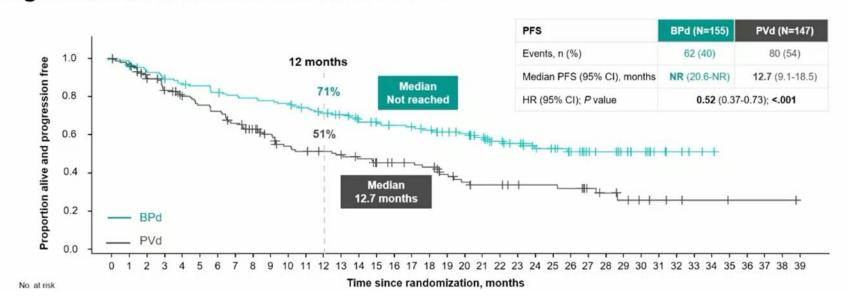


PFS ^a	BVd (N=243)	DVd (N=251)
Events, n (%)	91 (37)	158 (63)
PFS, median (95% CI), ^b months	36.6 (28.4-NR)	13.4 (11.1-17.5)
HR ^c (95% CI)	0.41 (0.31-0.53)	
P value ^d	<.00001	

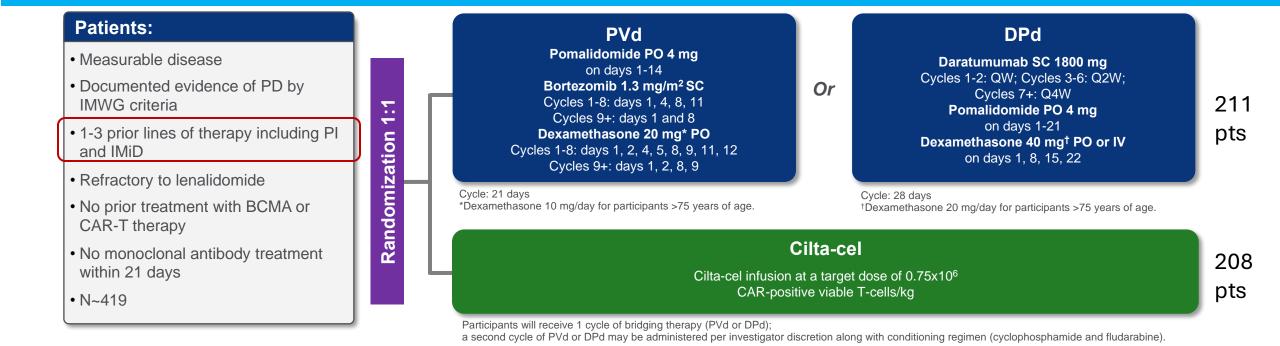
Significant PFS Benefit with BPd vs PVd

Dimopoulos et al. EHA2024

8



CARTITUDE-4 (Phase 3) Study Design: 1-3 PLT

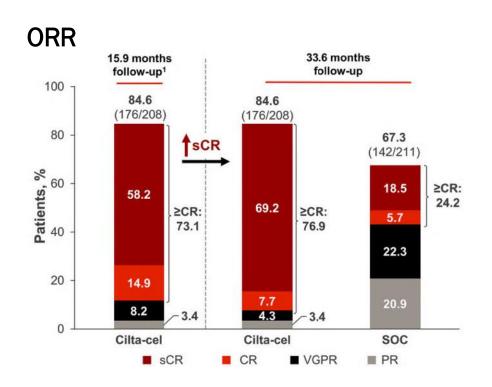


Primary Outcome:	Secondary Outcomes:	
Progression-free survival	CR or sCR MRD negativity status Sustained MRD negative rate	HRQoLOS, ORR, PFS2Safety

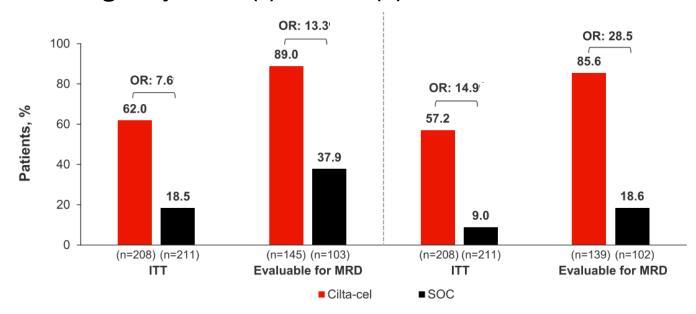
Primary endpoint of PFS was met and study now reported

1. https://clinicaltrials.gov/ct2/show/NCT04181827 2. https://www.prnewswire.com/news-releases/janssen-announces-unblinding-of-phase-3-cartitude-4-study-of-carvykti-cilta-cel-as-primary-endpoint-met-in-treatment-of-patients-with-relapsed-and-refractory-multiple-myeloma-301732398.html. San Miguel j. et al. NEJM 2023

Long-term Update CARTITUDE-4 Phase 3 Trial: Response



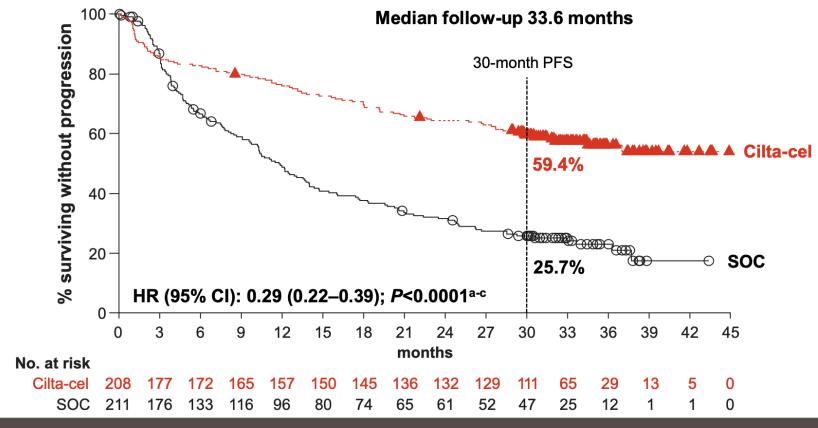
MRD Negativity at 10⁻⁵ (L) and 10⁻⁶ (R)



DOR	Cilta-Cel (n=208)	SOC (n=211)
Median, months (95% CI)	NR	18.7 (12.9-23.7)
30-month rate, % (95% CI)	67.4 (59.7-74.0)	35.5 (27.6-43.6)

Mateos, MV, et al. IMS 2024. Abstract OA-65.

Long-Term CARTITUDE-4 Update (34 Months): Cilta-cel Maintained Significant Improvement in Progression-Free Survival



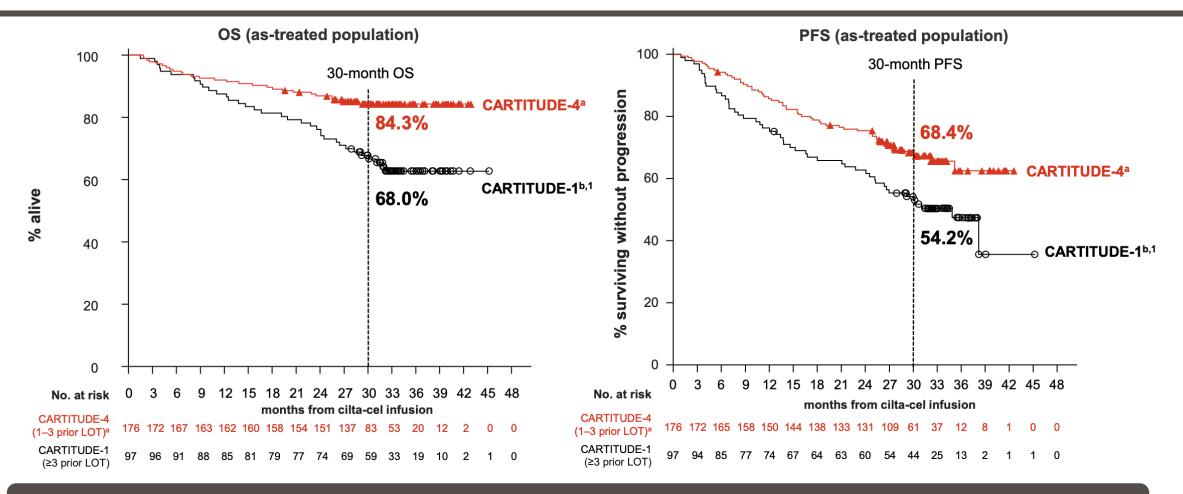
~70% reduction in the risk of progression or death in patients who received cilta-cel and mPFS has not been reached



^aConstant piecewise weighted log-rank test. ^bHR and 95% CI from a Cox proportional hazards model with treatment as the sole explanatory variable, including only PFS events that occurred >8 weeks post randomization.

Cilta-cel, ciltacabtagene autoleucel; HR, hazard ratio; mPFS, median progression-free survival; PFS, progression-free survival; SOC, standard of care.

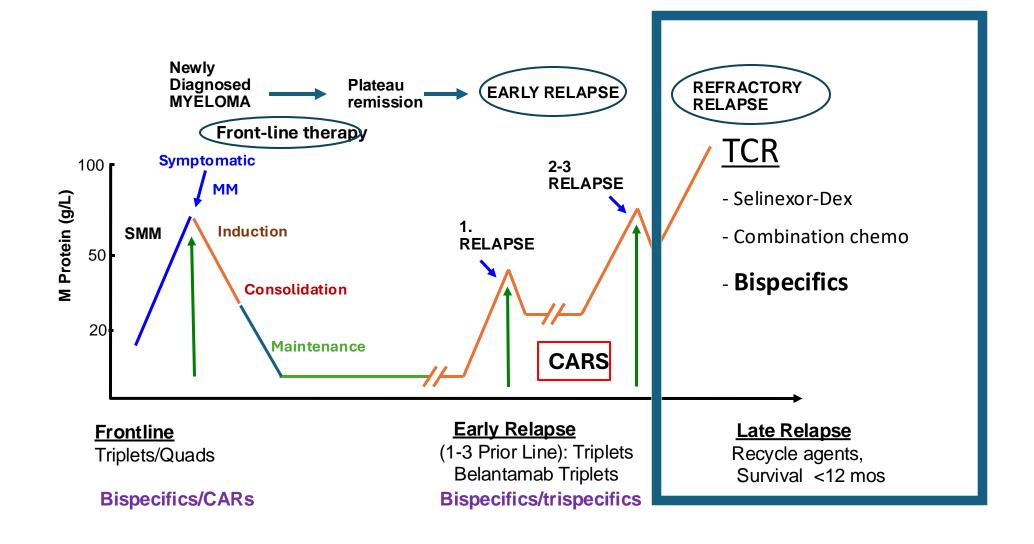
Long-Term CARTITUDE-4 Update (34 Months): Numerically Higher Overall and Progression-Free Survival Rates Versus CARTITUDE-1



Cilta-cel use in earlier lines demonstrated numerically higher rates of overall and progression-free survival

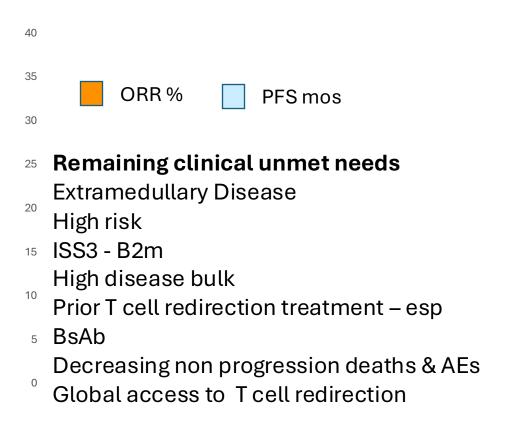


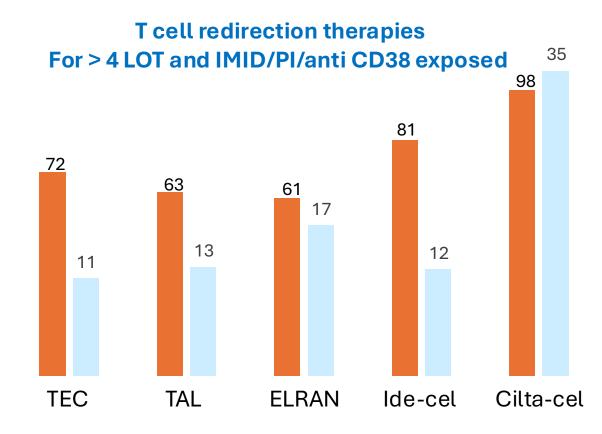
Sequencing Therapy in MM after Front-Line: How should we sequence all these agents?



Trials:

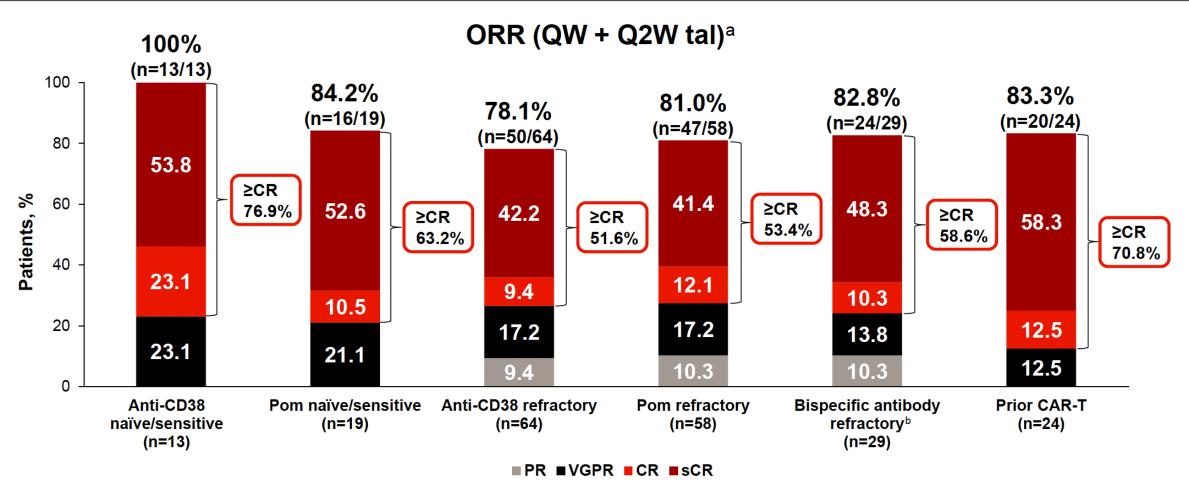
Overall Response Rate (ORR) and Progression Free Survival (PFS) of Recently Approved Therapies in RRMM





Richardson P et al Blood 2014;123(12):1826-32 Siegel DS et al. Blood 2012;120(14): 2817–2825 Lonial S et al. Lancet 2016;387:1551-1560 Chari A et al. N Eng J Med 2019;381:727-738 Rasche et al EHA 2024 Van De Donk et al IMS 2023 Lesohkin et al Nat Med 2023 Anderson L et al. ASCO 2021;abstract 8016 (poster presentation) Usmani S et al ASCO 2022;abstract 8028 (poster presentation)

TRIMM-2 Tal + Dara + Pom Cohort: High ORRs in Prior Exposure Subgroups

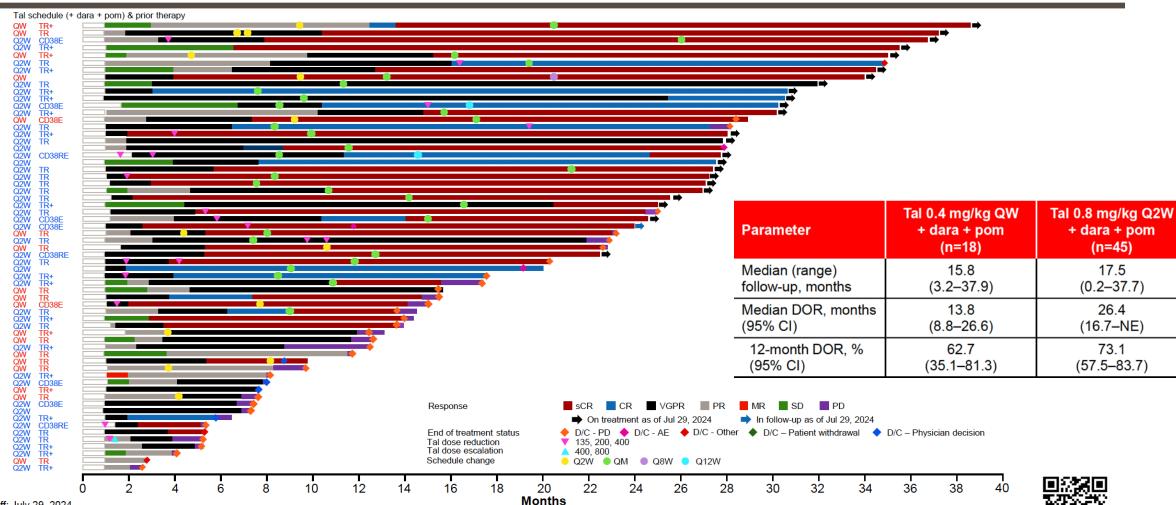


Data cut-off: July 29, 2024.

Anti-CD38 naïve = never received anti-CD38 therapy; anti-CD38 sensitive = minimal response or better during treatment; anti-CD38 refractory = best response of SD or PD during treatment or within 60 days of completing anti-CD38 therapy. aResponse was assessed by investigators, based on IMWG criteria. Percentages are calculated with the number of patients in each group as denominator. bAll 29 patients who received prior bispecific antibody therapy were refractory. CAR, chimeric antigen receptor; CR, complete response; dara, daratumumab; IMWG, International Myeloma Working Group; ORR, overall response rate; pom, pomalidomide; PD, progressive disease; PR, partial response; Q2W, every other week; QW, weekly; sCR, stringent complete response; SD, stable disease; tal, talquetamab; VGPR, very good partial response.



TRIMM-2 Tal + Dara + Pom Cohort: Responses Deepened Over Time, Irrespective of Dose Intensity Reductions



+, penta-drug refractory; AE, adverse event; CD38E, anti-CD38 therapy exposed; CD38RE, anti-CD38 therapy refractory; CR, complete response; dara, daratumumab; D/C, discontinuation; MR, minimal response; Q2W, every other week; Q8W, every 8 weeks; Q12W, every 12 weeks; QM, monthly; QW, weekly; PD, progressive disease; PR, partial response; sCR, stringent complete response; SD, stable disease; TR, triple-class refractory; VGPR, very good partial response.

Data cut-off: July 29, 2024.



RedirecTT-1 Tal + Tec: Study Design

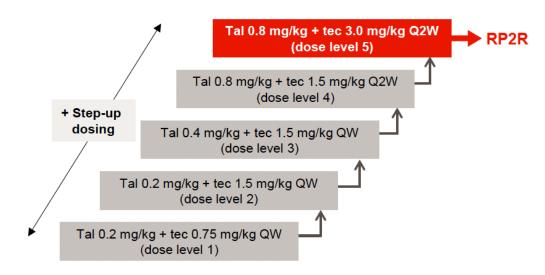
Key eligibility criteria

- Measurable MM
- EMD permitted (≥1 nonradiated, bone-independent lesion ≥2 cm)
- RR or intolerant to established therapies, including last LOT
- Triple-class exposed (prior PI, IMiD, anti-CD38)

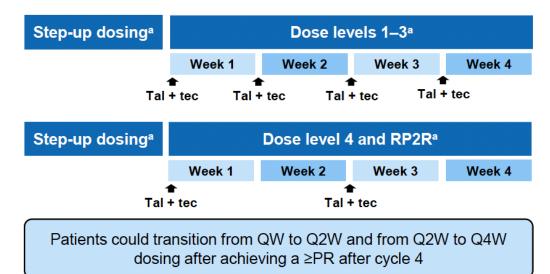
Key objectives

- Safety, including DLTs
- Identify RP2R(s)
- ORR, DOR, time to response, PK, immunogenicity
- PFS

Phase 1 dose escalation



Dosing schedule



^aTal and tec administered on the same day, 30 (±10) minutes apart, for all step-up and full treatment doses. DLT, dose-limiting toxicity; DOR, duration of response; EMD, extramedullary disease; IMiD, immunomodulatory drug; LOT, line of therapy; MM, multiple myeloma; ORR, overall response rate; PFS, progression-free survival; PI, proteasome inhibitor; PK, pharmacokinetics; PR, partial response; Q4W, monthly; Q2W, every other week; QW, weekly; RP2R, recommended phase 2 regimen; RR, relapsed/refractory; tal, talquetamab; tec, teclistamab.



RedirecTT-1 Tal + Tec: High ORR and Deep Responses, Including in EMD^a

ORR (all treated patients)^b ΑII 100 79.5% 76.0% **EMD** (35/44)(38/50)80 61.1% 56.3% (11/18)29.5 24.0 (9/16)60 ≥CR ≥CR 11.1 6.3 52.3% 44.0% ≥CR ≥CR 12.5 18.8% 20.0 40 33.3% 22.2 22.7 25.0 20 28.0 25.0 27.8 RP2R DL 1-4 RP2R DL 1-4 ■PR ■VGPR ■CR ■sCR

All patients	RP2R (n=44)	DL 1–4 (n=50)
Median (range) follow-up, months	18.2 (0.7–27.0)	29.0 (0.5 ^c –37.1)
Median (range) time to first response, months	1.4 (0.3–5.1)	2.1 (1.1–7.7)
Median (range) time to best response, months	4.9 (1.4–19.8)	4.9 (1.1–30.6)

Patients with EMD	RP2R (n=18)	DL 1–4 (n=16)
Median (range) follow-up, months	13.6 (0.7–25.9)	18.7 (0.5c–33.8)
Median (range) time to first response, months	3.0 (1.4–5.1)	2.6 (2.1–3.8)
Median (range) time to best response, months	6.3 (3.0–10.7)	3.9 (2.1–10.7)

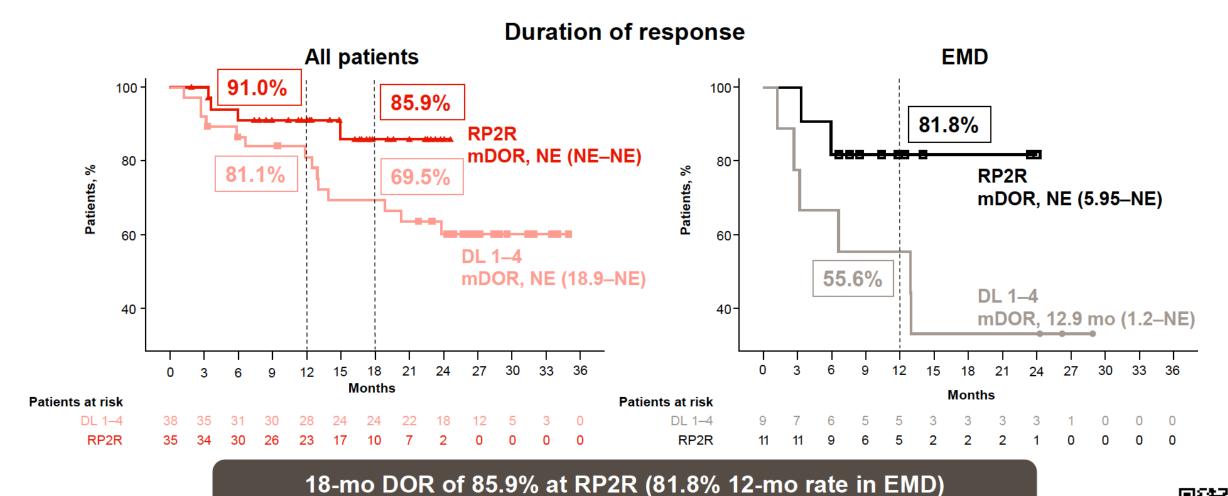
ORR 79.5% (61.1% in EMD) at RP2R with rapid and deep responses

Data cut-off date: March 15, 2024.

^aEMD defined as ≥1 nonradiated, bone-independent lesion ≥2 cm. ^bResponses were investigator-assessed per IMWG 2016 criteria. Data shown are confirmed responses and calculated in all treated patients. ^cDenotes patients who died. CR, complete response; DL, dose level; EMD, extramedullary disease; IMWG, International Myeloma Working Group; ORR, overall response rate; PR, partial response; RP2R, recommended phase 2 regimen; sCR, stringent complete response; tal, talquetamab; tec, teclistamab; VGPR, very good partial response.



RedirecTT-1 Tal + Tec: Highly Durable Responses, Including in EMD^a





Immunotherapy Bispecific Trials

Current and planned (not inclusive of all trials)

Myeloma Treatment Paradigm

BCMA

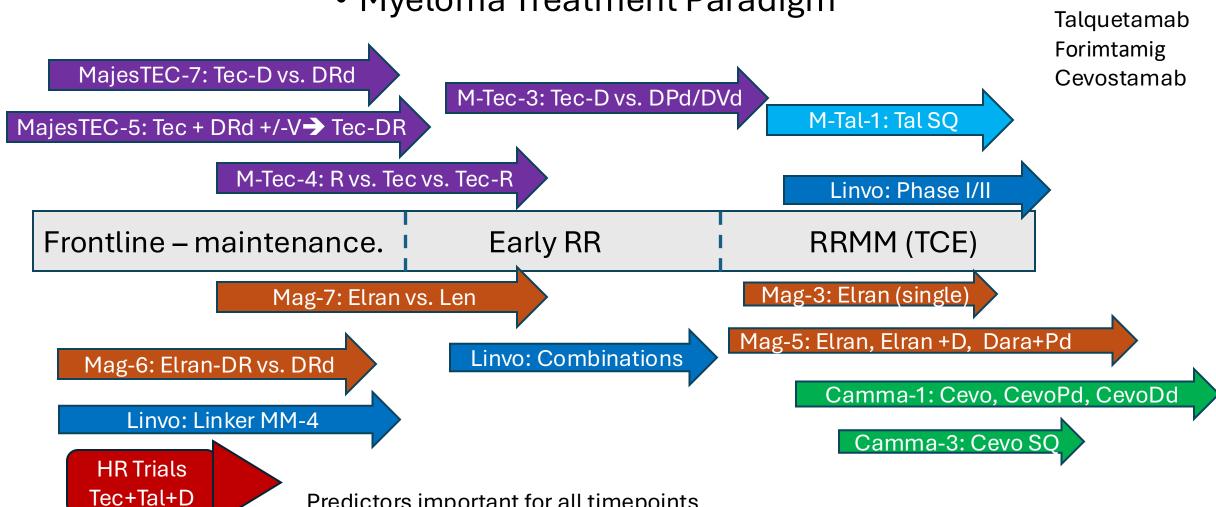
Teclistamab

Elranatamab

ABBV-383

Non-BCMA

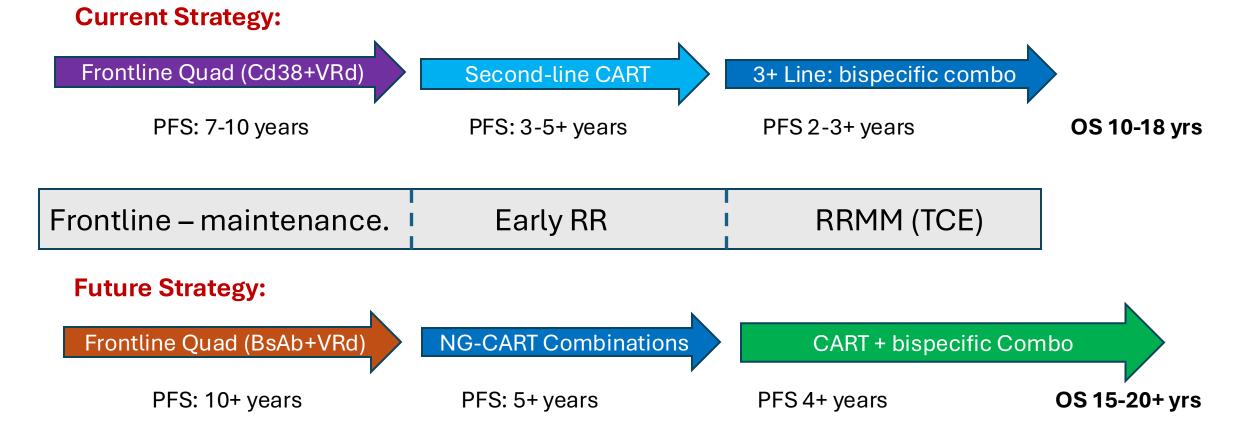
Linvoseltamab



Predictors important for all timepoints

Summary: Sequencing in Multiple Myeloma

Myeloma Treatment Paradigm



GOAL: Time-limited therapy!!!! At each Line of therapy; Chronic illness => CURE