Efficacy and Safety of Talquetamab + Teclistamab in Patients With Relapsed/Refractory Multiple Myeloma and Extramedullary Disease: Updated Phase 2 Results From the RedirecTT-1 Study With Extended Follow-Up

Saad Z Usmani^{1*}, Shaji Kumar^{2*}, María-Victoria Mateos³, Jing Christine Ye⁴, Shebli Atrash⁵, Hila Magen⁶, Hang Quach⁷, Michael P Chu⁸, Suzanne Trudel⁹, Joshua Richter¹⁰, Paula Rodríguez-Otero¹¹, Hun Chuah¹², Moshe Gatt¹³, Eva Medvedova¹⁴, Shahzad Raza¹⁵, Dok Hyun Yoon¹⁶, Tadao Ishida¹⁷, Jeffrey V Matous¹⁸, Laura Rosiñol¹⁹, Koichi Onodera²⁰, Carmela Maffucci²¹, Emma Scott²², Christoph Heuck²², Jenny Zhang²², Todd Henninger²¹, Lisa O'Rourke²², Payal Thakkar²¹, Mariacristina Festa²³, Guoqiang Zhang²², Sheetal Khedkar²⁴, Lin Huang²², Jiangxiu Zhou²², Mikihiro Takamoto²⁵, Lixia Pei²¹, Jiashen Lu²⁶, Nicholas Au²², Maria Krevvata²², Yael C Cohen²⁷

¹Memorial Sloan Kettering Cancer Center, New York, NY, USA; ²Mayo Clinic Rochester, Rochester, MN, USA; ³University Hospital of Salamanca/IBSAL/CIC/CIBERONC, Salamanca, Spain; ⁴MD Anderson Cancer Center, University of Texas, Houston, TX, USA; ⁵Levine Cancer Institute-Atrium Health, Charlotte, NC, USA; ⁶Chaim Sheba Medical Center, Ramat-Gan, Faculty of Medical and Health Sciences, Tel Aviv, Israel; ³University of Melbourne, St Vincent's Hospital, Melbourne, VIC, Australia; ³Alberta Health Services, Edmonton, AB, Canada; ³Princess Margaret Cancer Centre, Toronto, ON, Canada; ¹⁰Mount Sinai Medical Center, New York, NY, USA; ¹¹Cancer Center Clínica Universidad de Navarra, Cima, Pamplona, Spain; ¹²Royal Perth Hospital, Perth, WA, Australia; ¹³Hadassah Medical Cener, Hebrew University of Jerusalem, Jerusalem, Israel; ¹⁴Knight Cancer Institute, Oregon Health and Science University, Portland, OR, USA; ¹⁵Taussig Cancer Institute, Cleveland, OH, USA; ¹⁵Asan Medical Center, University of Ulsan College of Medicine, Seoul, Republic of Korea; ¹¹7Japanese Red Cross Medical Center, Tokyo, Japan; ¹®Colorado Blood Cancer Institute and Sarah Cannon Research Institute, Denver, CO, USA; ¹¹Phospital Clínic de Barcelona, IDIBAPS, Barcelona, Spain; ²¹Tohoku University Hospital, Sendai shi, Miyagi, Japan; ²¹Johnson & Johnson, Raritan, NJ, USA; ²²Johnson & Johnson, Spring House, PA, USA; ²³Johnson & Johnson, Leiden, Netherlands; ²⁴Johnson & Johnson, Horsham, PA, USA; ²⁵Johnson & Johnson, Tokyo, Japan; ²⁶Johnson, Shanghai, China; ²²Tel Aviv Sourasky (Ichilov) Medical Center, Gray Faculty of Medical and Health Sciences, Tel Aviv University, Tel Aviv, Israel

*Contributed equally.

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Extramedullary Disease (EMD) Is Associated With Poor Survival in Myeloma

BONE DEPENDENT

Paramedullary disease^{1,2}

Plasmacytomas growing contiguously with bone and extending into soft tissue after cortical disruption

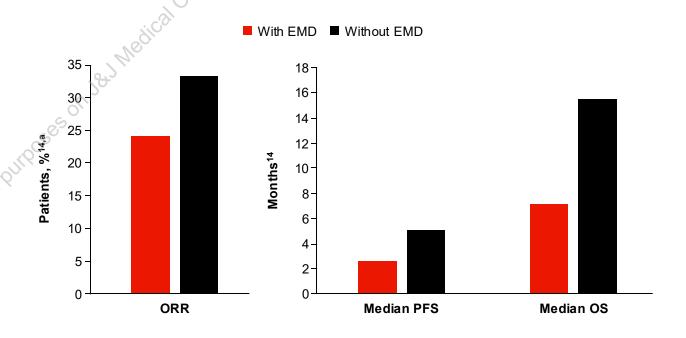
BONE INDEPENDENT

True EMD^{1,2}

Soft tissue/organ-associated plasmacytomas noncontiguous with bony structures

Inferior outcomes vs patients with paramedullary plasmacytomas and patients with myeloma without EMD³⁻¹⁴

Patients with true EMD are 87% less likely to respond to real-world SOC treatments¹³ and have worse outcomes vs patients without EMD¹⁴



^aDefined as the proportion of patients who achieved a PR or better. ORR, overall response rate; OS, overall survival; PFS, progression-free survival; PR, partial response; SOC, standard-of-care. 1. Ho M, et al. *Curr Oncol* 2025;32:182. 2. Bladé J, et al. *Blood Cancer J* 2022;12:45. 3. Rosiñol L, et al. *Br J Haematol* 2021;194:496-507. 4. Pour L, et al. *Haematologica* 2014;99:360-4. 5. Mangiacavalli S, et al. *Ann Hematol* 2012;91:1031-7. 7. Richard S, et al. *Blood* 2022;140(Suppl 1):4301-2. 8. Pan D, et al. *Blood* 2023;142(Suppl 1):1006. 9. Dima D, et al. *Blood Cancer J* 2024;14:90.

10. Zanwar S, et al. *J Hematol Oncol* 2024;17:42. 11. Usmani SZ, et al. *Haematologica* 2012;97:1761-7. 12. Beksac M, et al. *Haematologica* 2020;105:201-8. 13. Voorhees PM, et al. *Ann Hematol* 2025; doi: 10.10007/s00277-025-06705-3. 14. Moreau P, et al. *Clin Lymphoma Myeloma Leuk* 2025;S2152-2650(25)00106-5.



RedirecTT-1: Dual Myeloma Antigen Targeting of GPRC5D and BCMA With Tal + Tec in Patients With True EMD

- EMD lesions are highly complex and exhibit heterogeneous GPRC5D and BCMA expression ^{1,2}; a dual-targeting approach may mitigate antigen-related escape
- Talquetamab (Tal; anti-GPRC5D) and teclistamab (Tec; anti-BCMA) are first-in-class BsAbs approved as monotherapies for RRMM, including difficult-to-treat disease³⁻⁷
- With a median follow-up of 12.6 months, primary analysis of Tal + Tec in the dedicated RedirecTT-1 phase 2 EMD cohort showed^{8,a}:
 - -ORR,^b 79%
 - 12-month PFS, 61%

We report updated efficacy^b and safety from RedirecTT-1 phase 2 with a median follow-up of 16.8 months, including EMD location data and a novel tumor burden analysis as a prognostic indicator of ORR

^aData cut-off date: March 15, 2025. ^bAssessed by independent review committee per IMWG criteria.

BCMA, B-cell maturation antigen; BsAb, bispecific antibody; GPRC5D, G protein—coupled receptor family C group 5 member D; IMWG, International Myeloma Working Group; RRMM, relapsed/refractory multiple myeloma.

1. John M, et al. *Blood* 2024;144:2121-35. 2. Zanwar, S. et al. *Blood Adv* 2025;9:3979-87. 3. Chari A, et al. *Lancet Hematol* 2025;e269-81. 4. Chari A, et al. *N Engl J Med* 2022;387:2232-42. 5. TALVEY (talquetamab-tgvs).

Prescribing information. Horsham, PA: Janssen Biotech, Inc., 2023. 6. Moreau P, et al. *N Engl J Med* 2022;387:495-505. 7. TECVAYLI (teclistamab-cqyv). Prescribing information. Horsham, PA: Janssen Biotech, Inc; 2024.

8. Kumar S, et al. *N Engl J Med* 2025; doi:10.1056/NEJMoa2514752.



RedirecTT-1 Phase 2 EMD (Tal + Tec): Largest Dedicated Study in Patients With True EMD

Screening

Eligibility criteria

- Triple-class exposed RRMM^a
- True EMD, defined as ≥1 nonradiated bone-independent soft tissue plasmacytoma ≥2 cm in greatest dimension confirmed by central review of PET-CT scans^{b,c}
- Prior CAR-T and non-BCMA/-GPRC5D bispecific antibody therapies were permitted
- Nonsecretory and oligosecretory disease were permitted

Treatment

Tal 0.8 mg/kg Q2W SCd,e

Tec 3.0 mg/kg Q2W SCd,e

Option to switch to monthly dosing after 4 cycles and ≥VGPR, or after 6 cycles (irrespective of response)

Step-up dosing^d 2–4 days apart (Tal + Tec)

SUD1: 0.01 mg/kg + 0.06 mg/kg

SUD2: 0.06 mg/kg + 0.3 mg/kg

SUD3: 0.4 mg/kg + 1.5 mg/kg

Endpoints

Primary endpoint: ORR^f

Secondary endpoints:

- DORf
- PFSf
- OS
- Safety

^aIncludes prior exposure to a proteasome inhibitor, immunomodulatory drug, anti-CD38 monoclonal antibody. ^bPatients may have had paramedullary plasmacytomas in addition to true EMD. ^cWhole-body MRI permitted with sponsor approval. ^dTal and Tec administered on the same day, 30 (±10) minutes apart, for all step-up and full treatment doses. ^eUntil disease progression. ^fResponse and PFS were assessed by an independent review committee per IMWG criteria; EMD response was assessed by PET-CT or MRI whole-body scans. CAR, chimeric antigen receptor; DOR, duration of response; MRI, magnetic resonance imaging; PET-CT, positron emission tomography—computed tomography; Q2W, every other week; SC, subcutaneous; SUD, step-up dose; VGPR, very good partial response.

Kumar S, et al. N Engl J Med 2025; doi:10.1056/NEJMoa2514752.



RedirecTT-1 Phase 2 EMD (Tal + Tec): EMD Response Assessment Incorporating Gold Standard Deauville and IMPETUS Criteria

- IMWG 2016 response criteria were assessed by an independent review committee
- As IMWG criteria do not provide PET-CT-specific response criteria, an FDG-PET 5-point scale per Deauville and IMPETUS criteria was incorporated for radiographic criteria for EMD response:
 - -CR: disappearance of all plasmacytomas or persistence of fibrotic disease with PET score 1–3
 - VGPR and PR: a ≥90% or ≥50% reduction in size, respectively, in all plasmacytomas with a reduction in PET avidity compared to baseline
- In nonsecretory disease, response was evaluated by functional imaging, and IMWG criteria also had to be met for CR

Prospective EMD response assessed by central radiology using FDG PET-CT, Deauville scale, and IMPETUS criteria



RedirecTT-1 Phase 2 EMD (Tal + Tec): Baseline Characteristics Reflective of Triple-Class Exposed RRMM With EMD

Baseline characteristics

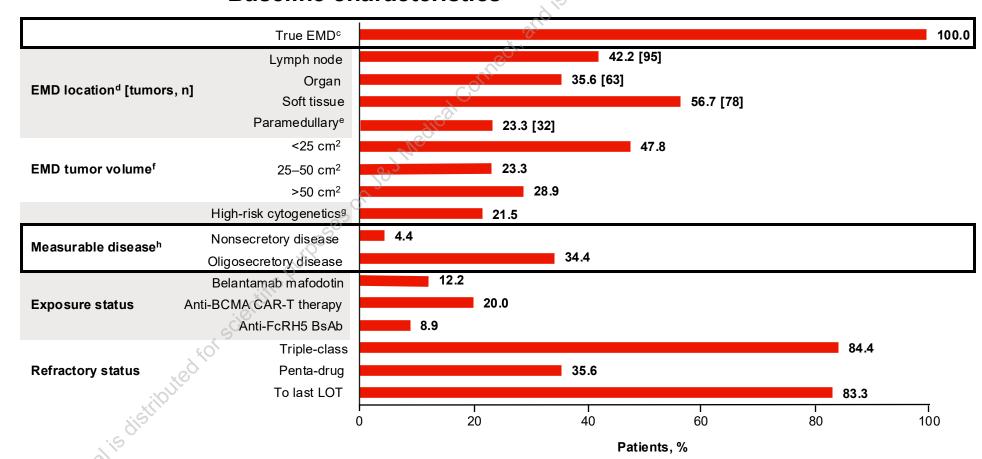
90 patients received Tal + Tec

Age^a 64.5 (42–84) years

Male 63.3%

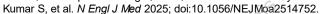
Years since diagnosis^{a,b} 4.7 (0.7–21.4)

Prior LOT^a 4 (1–10)



Data cut-off date: July 18, 2025.

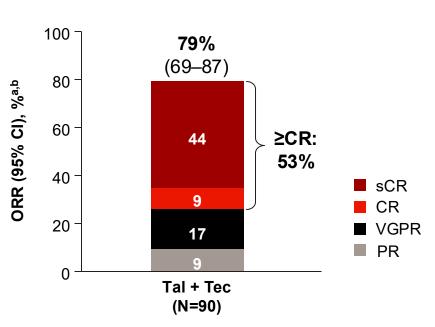
FcRH5, Fc receptor-homolog 5; FISH, fluorescence in situ hybridization; LOT, line of therapy.





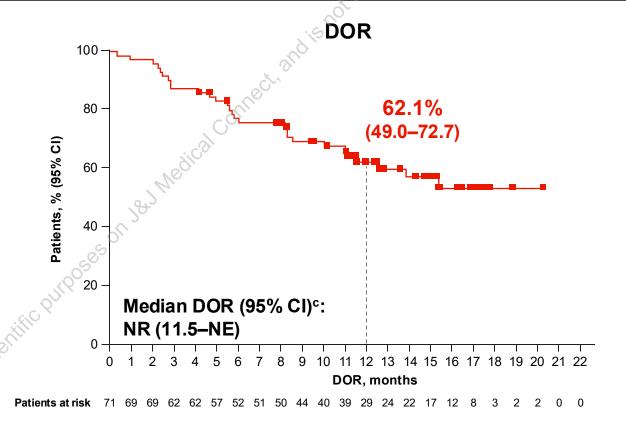
Data are presented as median (range). Calculated in n=89. 1 nonradiated bone-independent soft tissue plasmacytoma (≥2 cm in greatest dimension) confirmed by PET-CT scans. Patients could have ≥1 EMD location. Paramedullary lesions were also present alongside true EMD in 21 (23.3%) patients. Volume assessed for true EMD only. FISH or karyotype testing in n=65; defined as del(17p), t(4;14), or t(14;16). Per IMWG criteria.

RedirecTT-1 Phase 2 EMD (Tal + Tec): Deep, Durable Responses at 16.8 Months Median Follow-up



Median (range) time to:

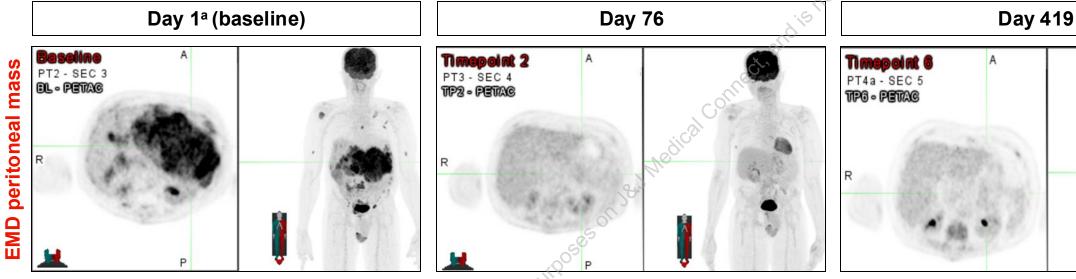
- First response, 2.6 (1.0–5.8) months
- Best response, 5.1 (1.0–16.6) months



With additional ~4 months of median follow-up, ORR approached 80%; 62% of responders remained in response at 1 year



RedirecTT-1 Phase 2 EMD (Tal + Tec): Integration of Central PET-CT for EMD Response Assessment

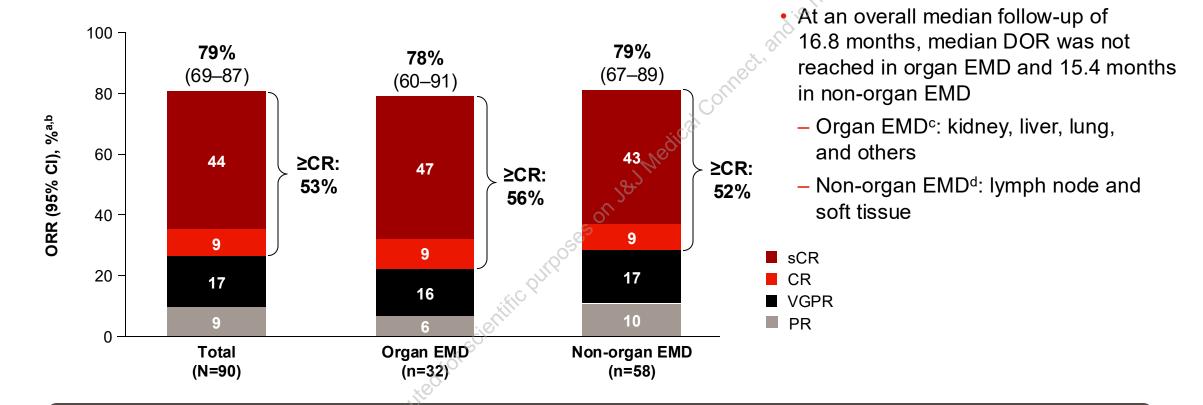


Characteristic	Day 1ª (baseline)	Day 76	Day 167	Day 250	Day 419
Overall EMD tumor response	NA SON	VGPR	VGPR	CR⁵	CR ^b
5-point Deauville scale ^c	5 0	5	4	1	1

Accurate EMD assessment by high-sensitivity FDG PET-CT using 5-point Deauville scale and IMWG criteria to confirm treatment efficacy; patient remains in CRb with Tal + Tec



RedirecTT-1 Phase 2 EMD (Tal + Tec): High ORR Regardless of EMD Location

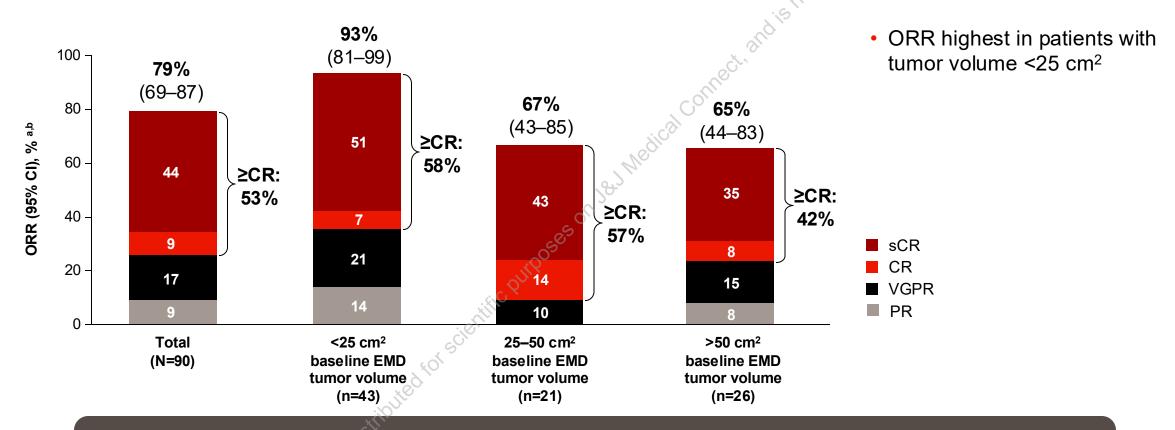


Patients with true EMD achieved deep responses with dual-antigen targeting Tal and Tec

Data cut-off date: July 18, 2025. ORR was assessed by independent review committee per IMWG criteria. Due to rounding, individual response rates may not sum to the ORR. Full list of organ EMD locations include adrenal gland, kidney, liver (left lobe, right lobe), lung (left, left lower lobe), pancreas, pericardium, peritoneum, and pleura. Full list of non-organ EMD locations include lymph node (axillary, cervical, iliac, inguinal, lymph, mediastinal, mesenteric, para-aortic, peripancreatic, porta hepatis, retrocrural, retroperitoneal, and supraclavicular) and soft tissue (abdominal, breast, chest wall, mediastinum, muscle, omentum, other, pelvis, retroperitoneum, and skin).



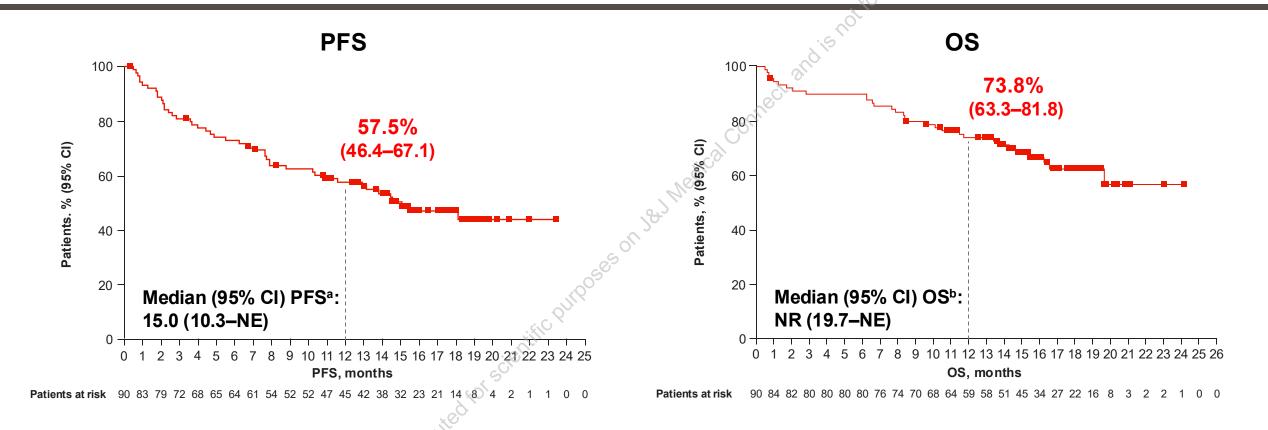
RedirecTT-1 Phase 2 EMD (Tal + Tec): ORR Was High Across All Baseline EMD Tumor Volume Subgroups



Highest responses with lowest baseline volumes; responses at higher volumes were generally comparable with the total population



RedirecTT-1 Phase 2 EMD (Tal + Tec): PFS and OS at 16.8 Months Median Follow-up

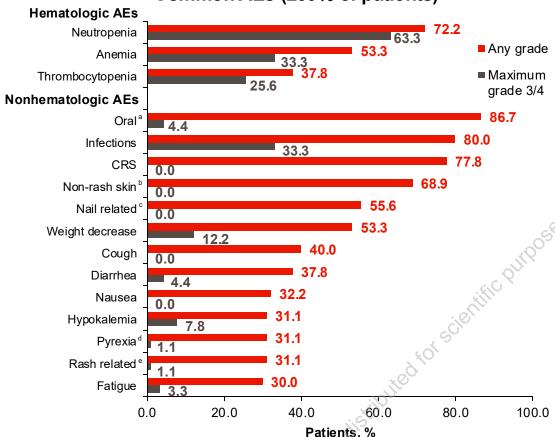


With over 1 year of median follow-up, median PFS was 15 months and median OS was not reached



RedirecTT-1 Phase 2 EMD (Tal + Tec): AEs Were Consistent With Safety Profiles of Tal and Tec

Common AEs (≥30% of patients)



Outcome, ^f n (%)	Initial Q2W dosing (N=90)	After adjustment to Q4W dosing (n=56) ⁹		
Any-grade infections	65 (72.2)	34 (60.7)		
Grade ≥3 infections	29 (32.2)	14 (25.0)		
Weight decrease	46 (51.1)	15 (26.8)		
Grade 3/4 weight decrease	8 (8.9)	5 (8.9)		
Oral AEs ^a	77 (85.6)	12 (21.4)		
Grade 3/4 oral AEs ^a	3 (3.3)	2 (3.6)		

New onset of key any-grade AEs were less common with adjusted Q4W dosing

Data cut-off date: July 18, 2025. Median follow-up: 16.8 months.

AEs listed are those occurring in ≥30% of the total study population. AEs were reported as treatment-emergent AEs recorded up to 30 days after the patient received last study treatment dose or until start of subsequent therapy.
^aIncludes ageusia, chelitis, dry mouth, dysgeusia, dysphagia, glossitis, glossodynia, hypogeusia, mouth ulceration, oral discomfort, oral mucosal erythema, oral pain, stomatitis, swollen tongue, taste disorder, tongue discomfort, tongue erythema, tongue edema, and tongue ulceration.
^bIncludes skin exfoliation, dry skin, pruritus, and palmar-plantar erythrodysesthesia syndrome.
^cIncludes nail discoloration, nail disorder, onycholysis, onychomadesis, onychoclasis, nail dystrophy, nail toxicity, and nail ridging.
^dExcludes symptoms of CRS or ICANS.
^eIncludes rash, maculopapular rash, erythematous rash, and erythema.
^fNew-onset AEs only; AEs are only counted once either before or after switch.
^gA patients did not switch to Q4W dosing.

AE, adverse event; CRS, cytokine release syndrome; ICANS, immune effector cell-associated neurotoxicity syndrome; Q4W, every 4 weeks.



RedirecTT-1 Phase 2 EMD (Tal + Tec): Summary of Infections

Most common AEs	Tal + Tec (N=90)			
(≥10% overall), ^a n (%)	Any Grade	Maximum Grade 3/4		
Infections	72 (80.0)	30 (33.3)		
URTI	27 (30.0)	4 (4.4)		
COVID-19	20 (22.2)	5 (5.6)		
Pneumonia	19 (21.1)	8 (8.9)		
UTI	12 (13.3)	4 (4,4)		
Viral upper respiratory tract infection	9 (10.0)	2 (2.2)		

^{• 6.7%} of patients had opportunistic infections, b 3.3% were grade 3/4

- Infections were common; however, grade 3/4 infections were consistent with Tec monotherapy¹
 - Grade 3/4 infections mostly limited to first 6 months
 and then declined
 - Median duration of infection, 13.0 days
- At baseline, 22.2% of patients had Ig values <400 mg/dL
- 71.1% of patients had posttreatment hypogammaglobulinemia^c
- 75.6% of all patients received ≥1 dose of lg replacement
 - Ig replacement was highly recommended to prevent infection

Grade 3/4 infection rate was 33%, generally consistent with Tec monotherapy in MajesTEC-11



^aAEs were graded by CTCAE v5.0; patients could experience ≥1 infection. ^bPatients could experience ≥1 opportunistic infection; CMV infection reactivation (n=4), CMV infection (n=2), CMV esophagitis (n=1), esophageal candidiasis (n=1), and polyomavirus viremia (n=1). ^cPosttreatment IgG <400 mg/dL or hypogammaglobulinemia treatment-emergent AE. Ig, immunoglobulin; CMV, cytomegalovirus; URTI, upper respiratory tract infection; UTI, urinary tract infection.

^{1.} Moreau P, et al. N Engl J Med 2022;387:495-505

RedirecTT-1 Phase 2 EMD (Tal + Tec): Summary of Treatment Discontinuations and Grade 5 AEs

- 8 (8.9%) patients discontinued
 Tal or Tec due to AEs
 - Tal + Tec, n=6a
 - Tal only, n=2^b
- 11 (12.2%) patients had grade
 5 AEs
 - -5 (5.6%) noninfection AEs
 - -6 (6.7%) infections

Outcome, n (%)	Study day of death	lgG level prior to death, mg/dL	Received ≥1 dose of lg replacement	Response at time of death			
Noninfections							
Aspiration*	15	1450	No	SD			
Respiratory failure	G ⁰ 19	221 No		SD			
General physical health deterioration	21	6731	Yes	SD			
Cerebral hemorrhage	25	2575	No	SD			
Euthanasia	233	379	Yes	PD			
200							
Infections							
Klebsiella sepsis	38	70	No	PR			
COVID-19 pneumonia ^{c,*}	63	2455	No	SD			
Klebsiella pneumonia*	86	892	Yes	PR			
Pseudomonal sepsis*	190	246	No	PR			
Escherichia sepsis*	240	449	Yes	VGPR			
Pneumonia*	254	346	Yes	PD			

Of the 11 patients with EMD who had grade 5 AEs (6 were drug related^c), 7 were nonresponders with poor overall prognosis



RedirecTT-1 Phase 2 EMD (Tal + Tec): Transformative Efficacy in Largest Dedicated EMD Study to Date

- Deep and durable responses in true EMD with Tal + Tec; enhanced efficacy with an additional
 4 months follow-up in a population with significant unmet clinical need
 - ORR, 79% (≥CR, 53%)
 - 12-month DOR rate, 62.1%
 - Median PFS, 15.0 months
 - 12-month OS rate, 73.8%
- High ORR regardless of EMD location (organ, 78%; non-organ, 79%)
- Lower EMD tumor volume was associated with higher ORR
- The safety profile of Tal + Tec was generally consistent with observations for each agent alone
 - Infections common; critical to follow established protocols for prophylaxis and management

Dual targeting of GPRC5D and BCMA with Tal + Tec: a new SOC for patients with triple-class exposed RRMM with true EMD





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ORIGINAL ARTICLE

Dual Targeting of Extramedullary Myeloma with Talquetamab and Teclistamab

Shaji Kumar, M.D., María-Victoria Mateos, Ph.D., Shebli Atrash, M.D., María-Victoria Mateos, Ph.D., Shebli Atrash, M.D., Hila Magen, M.D., Hang Quach, M.D., M.D., Michael P. Chu, M.D., Suzanne Trudel, M.D., Shua Richter, M.D., Amade P. Chu, M.D., Suzanne Trudel, M.D., Shua Richter, M.D., Amade Raula Rodríguez-Otero, M.D., Ph.D., Hun Chuah, M.D., Ph.D., Matous, M.D., Ph.D., Shahzad Raza, M.D., Moshe Gatt, M.D., Shahzad Raza, M.D., Ph.D., Ph.D., Shahzad Raza, M.D., Ph.D., Shahzad Raza, M.D., M.D., Ph.D., Shahzad Raza, M.D., Ph.D., Shahzad Raza, M.D., Shahzad Raz

Acknowledgments

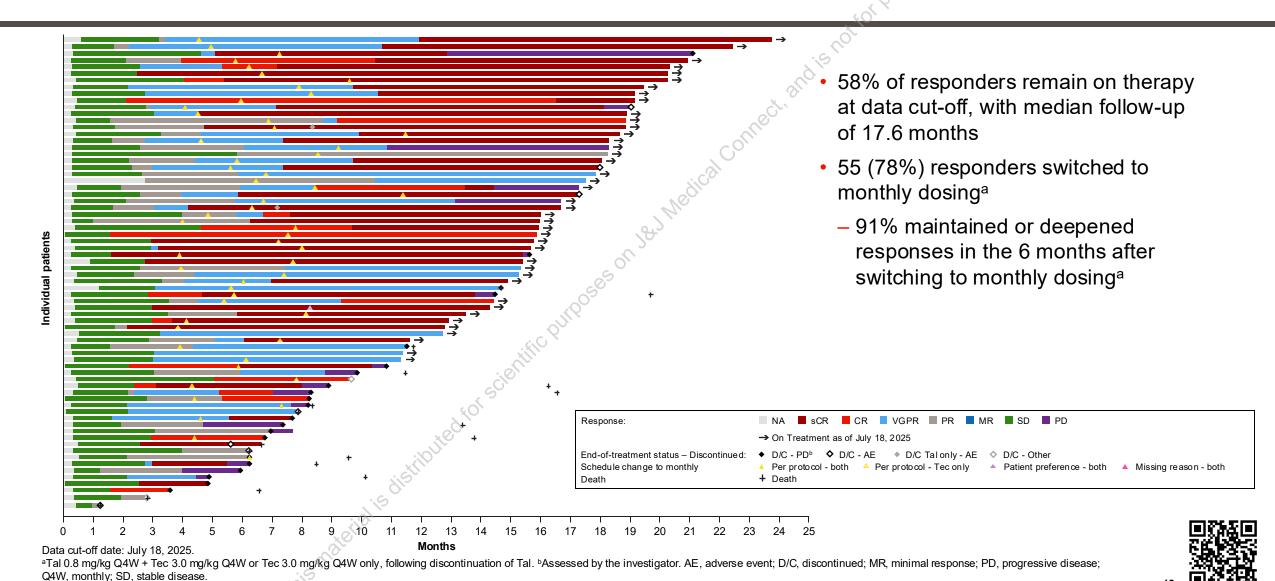
- We thank the patients who are participating in this study and their caregivers, the physicians and nurses who care for them, the staff at study sites, and the staff involved in data collection and analyses
- We thank all the RedirecTT-1 phase 2 study investigators
- This study was funded by Johnson & Johnson
- Medical writing support was provided by Rachael Smith, PhD, of Eloquent, part of Envision Ignite, an Envision Medical Communications agency, a part of Envision Pharma Group, and funded by Johnson & Johnson

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RedirecTT-1 Phase 2 EMD (Tal + Tec): Responses Deepened or Maintained in Most Patients With True EMD



RedirecTT-1 Phase 2 EMD (Tal + Tec): Rates of Infection

	New event onset						
Tal + Tec (N=90)	Total	≤6 months	>6 to ≤12 months	>12 to ≤18 months	>18 to ≤24 months	>24 to ≤36 months	
All patients treated within window, ^a n	90	000	65	43	14	0	
Total number of patients with infection, ^b n (%)	72 (80.0)	65 (72.2)	34 (52.3)	20 (46.5)	2 (14.3)	0	
Total number of patients with grade ≥3 infection, ^b n (%)	36 (40.0)	29 (32.2)	10 (15.4)	6 (14.0)	0	0	

