Treatment Preferences of Patients with Relapsed or Refractory Multiple Myeloma (RRMM) in the United States, United Kingdom, France, Spain, Italy, and Germany: Results from a Discrete Choice Experiment

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Introduction

Patients with multiple myeloma (MM) typically relapse following treatment and may progress through several lines of treatment, often involving combination regimens,[1,2] with little standardization of treatment sequencing.[3]

Treatment choice in relapsed/refractory multiple myeloma depends on factors relating to the treatment, disease, and patient, such as expected efficacy/tolerability, response/refractoriness to previous therapy, duration of prior remission, Eastern Cooperative Oncology Group performance status, comorbidities, and patient preference.[1,2,3] An acceptable balance between potential efficacy, side effects and administration burden should be targeted.[4]

Patient preferences are not always well understood. Physicians may be unaware of, or have a different view of, what patients consider most important when choosing therapy.[4,5]

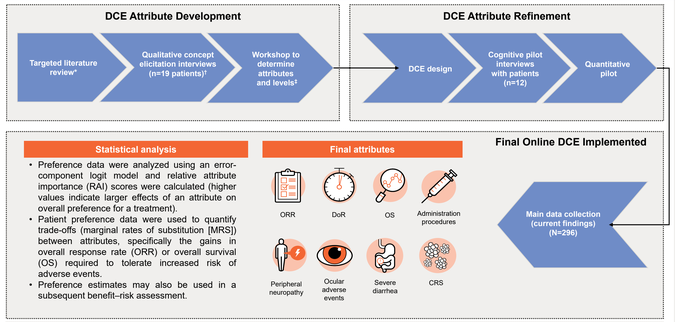
As the RRMM treatment landscape evolves, it is imperative to understand how differences in benefits, risks, and modes of administration influence patients' preferences for treatment as it could influence treatment adherence and clinical outcomes.[6,7]

Objective

This study quantified patient preferences to better understand which treatment attributes are most important to patients with RRMM and the benefit–risk trade-offs that patients are willing to make.

Methods

Figure 1. DCE attribute development and refinement



*Published evidence on approved or developing treatments for RRMM, qualitative and quantitative preference studies; †US, UK, Germany each n=5 patients and France n=4 patients; ‡Clinical expert input, and patient advocacy group and patient representative feedback. CRS, cytokine release syndrome; DCE, discrete choice experiment; DoR, duration of response; MRS, marginal rates of substitution

Adults with RRMM in the USA, UK, France, Spain, Italy, and Germany who were refractory to ≥2 prior lines of therapy (LOT) (including an immunomodulatory drug and proteosome inhibitor [PI]), or ≥3 prior LOTs (including a PI, immunomodulatory drug, or anti-CD38 agent) completed an online discrete choice experiment (DCE) including 12 experimental and 2 internal validity choice tasks between February and June 2022 (**Figure 1**). Patient-reported characteristics including sociodemographics, quality of life, and clinical history were collected through questionnaires.

The DCE asked survey participants to choose between hypothetical treatments that are characterized by a common set of attributes with different performance levels (**Table 1**). The attribute levels were systematically varied according to an experimental design and the resulting preference data were then used to value alternative configurations of treatment profiles from the patient perspective (**Figure 2**). The study benefited from multi-stakeholder input from patients, patient organizations, and clinical experts, and was a large, robust quantitative study reflecting the voice of patients with RRMM.

Table 1. DCE attributes and levels

Attribute	Levels
Likelihood of responding to treatment (ORR)	**25%** / **40%** / **55%** / **70%** / **85%**
Length of time in response (if you respond) (DOR)	**3 months** / **6 months** / **9 months** / **1 year** / **1.25 years**
Lifespan (OS)	**6 months** / **1 year** / **1.5 years** / **2 years**
Tingling or pain in hands and/or feet (peripheral neuropathy)	**0%** / **25%** / **50%**
Temporary vision change	**0%** / **20%** (20% mild, 0% moderate) / **40%** (20% mild, 20% moderate) / **60%** (40% mild, 20% moderate)
Inflammatory response (CRS)	**High risk** (15% do not experience, 80% have non-severe side effects, 5% have severe side effects) / **No risk**
Severe diarrhea	**0%** / **10%** / **20%**
Administration	**IV** or **SC** **outpatient twice per week** until progression / **IV** or **SC** **outpatient every 3 weeks** until progression / **IV** or **SC** **outpatient every week + oral pills** until progression / **IV** or **SC** **outpatient every month + oral pills** until progression / **CAR-T therapy** takes 1–2 months — one-time treatment until progression; inpatient in hospital for 7 days after treatment for monitoring; must stay near hospital for 4 weeks for monitoring after treatment; caregiver support required

CAR-T, chimeric antigen receptor T-cell therapy; CRS, cytokine release syndrome; DCE, discrete choice experiment; DOR, duration of response; IV, intravenous; ORR, overall response rate; OS, overall survival; SC, subcutaneous

Figure 2. DCE sample choice task

The task was described to the patients using the following text:

Please imagine that the doctor introduces you to 2 treatment options, *Treatment A* and *Treatment B*. Please carefully consider which treatment you would choose if you were offered these 2 options in real life. You can hover your mouse over each characteristic in the first column to read a description.

After each choice task, patients were asked to answer the following question:

If these were the only 2 treatments available to you and had been offered to you by your doctor, would you have:

1 Taken the treatment that you chose above
2 Taken neither of these treatments

	Administration	Number of people out of 100 who have: Severe diarrhea	Temporary vision change	Tingling or pain in hands and/or feet (peripheral neuropathy)	Inflammatory response (CRS)	Benefits: Length of time in response (if you respond) + lifespan	Likelihood of responding to treatment
Treatment A	**IV** or **SC** outpatient **every month + oral pills** until progression	0 out of 100 (0%)	40 out of 100 (40%): 20% mild, 20% moderate	0 out of 100 (0%)	No risk: 0 out of 100 (0%)	Time in response: 1 year; Lifespan: 2 years; 0 3 6 9 12 15 18 21 24 Months; Time in response: 1 year **Lifespan: 2 years**	55 out of 100 (55%)
Treatment B	**IV** or **SC** outpatient **every 3 weeks** until progression	20 out of 100 (20%)	60 out of 100 (60%): 40% mild, 20% moderate	25 out of 100 (25%)	High risk (85%): 80% non-severe, 5% severe	Time in response: 3 months; Lifespan: 6 months; 0 3 6 9 12 15 18 21 24 Months; Time in response: 3 months **Lifespan: 6 months**	85 out of 100 (85%)

Results

Patient characteristics

Self-reported patient characteristics, clinical characteristics, and health-related quality of life are shown in **Table 2**. Patients' mean age was 64 years, 52% were male, and patients had a median of 3 prior therapies.

Table 2. Self-reported patient and clinical characteristics and health-related quality of life

Self-reported patient characteristics	Overall (N=296)
Age, years, mean (SD)	63.8 (8.0)
Male, n (%)	154 (52)
Racial background, n (%)*	
White	74 (50)
Black	41 (28)
Asian	2 (1)
Other	8 (5)
Prefer not to say	24 (16)
With caregiver, n (%)	248 (84)
Employment status – Retired, n (%)	166 (56)
College education or postgraduate degree, n (%)	118 (40)
Self-reported clinical characteristics and health-related quality of life	**Overall (N=296)**
Time since initial diagnosis, years, mean (SD)	5.9 (3.8)
Number of prior lines of therapy, median (range)	3 (2–8)
Response status, n (%)	
In partial response	135 (46)
In complete response	92 (31)
Not in response	69 (23)
Overall severity of cancer symptoms, n (%)†	
No symptoms	41 (14)
Mild	74 (25)
Moderate	115 (39)
Severe	55 (19)
Very severe	11 (4)
Severity of fatigue in last 7 days, n (%)	
None or mild	77 (26)
Moderate	88 (30)
Severe–very severe	131 (44)

*US and UK only (N=149); collection of race data was not permitted in Germany, Italy, Spain, and France. †Cancer symptoms included frequency of diarrhea, severity of numbness/tingling, severity of blurry vision, severity of pain, and severity of fatigue, tiredness, or lack of energy in the last 7 days. MM, multiple myeloma; SD, standard deviation

Treatment Preferences

Figure 3 shows patients' preferences by treatment attribute level, and **Figure 4** describes the overall relative importance of each attribute as an additional component of the hypothetical regimen.

Efficacy was a key consideration for patients when choosing treatments, with changes in ORR being considered as the most important attribute, closely followed by changes in OS. These two attributes had the greatest impact on treatment choice when combined.

- Increasing ORR from 25% to 85% (RAI: 29.8%) and increasing OS from 6 months to 2 years (RAI: 20.4%) accounted for over half of decision making.

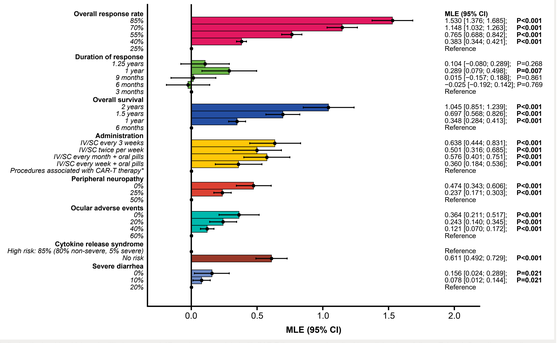
Administration procedures were also important (RAI: 12.4%).

- All IV or SC administration options (with or without oral pills) were preferred over all administration procedures that were comparable with CAR-T therapy (described as a one-off treatment over 1–2 months including apheresis, bridging therapies, hospitalization, and caregiver support).

Side effects were generally less important to patients than efficacy when considering treatment choices.

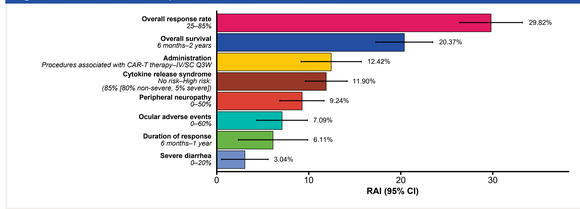
- With respect to the assessed side effects, CRS was most important to avoid, followed by peripheral neuropathy, ocular AEs, and severe diarrhea based on rank ordering of the RAI.
- Specifically, on average, patients showed most concern for the impact of CRS (from high risk to no risk; RAI: 11.9%) followed by peripheral neuropathy (from 50% to 0%; RAI: 9.2%), ocular side effects (from 60% to 0%; RAI: 7.1%), and severe diarrhea (from 20% to 0%; RAI: 3.0%).

Figure 3. Patient preferences for treatment attribute levels



Reference indicates the level to which each utility is compared. *Procedures associated with CAR-T therapy were described to participants as follows: Takes 1–2 months – one-time treatment until progression; patient in hospital for 7 days after treatment for monitoring; must stay near hospital for 4 weeks for monitoring after treatment; caregiver support required. CAR-T, chimeric antigen receptor T-cell therapy; CI, confidence interval; IV, intravenous; MLE, maximum likelihood estimate; SC, subcutaneous

Figure 4. Relative attribute importance of treatment attributes*



*RAI scores capture the maximum contribution of each attribute to a treatment preference in the DCE. RAI scores are conditional on the range of attribute levels and sum to 100%. Information in each parenthesis refers to the range of levels analyzed. CAR-T, chimeric antigen receptor T-cell therapy; CI, confidence interval; DCE, discrete choice experiment; IV, intravenous; Q3W, every 3 weeks; RAI, relative attribute importance; SC, subcutaneous

Attribute trade-offs

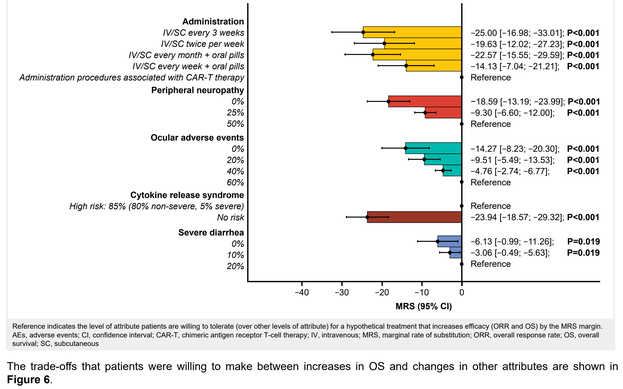
The trade-offs (MRS) that patients were willing to make for increases in ORR are shown in **Figure 5**.

In order to accept administration procedures associated with CAR-T over IV or SC Q3W administrations, patients would need to gain a 25% increase in ORR.

Regarding AEs, patients would be willing to accept a high risk of CRS (over no risk) if the hypothetical treatment provided a ~24% increase in ORR.

Likewise, patients would tolerate a 60% risk of ocular AEs (over no risk) in exchange for an additional ~14% ORR. Patients would also be willing to accept a 50% risk of peripheral neuropathy (over no risk) to gain ~19% ORR, or a 20% risk of severe diarrhea to gain ~6% ORR (over no risk).

Figure 5. Willingness to trade-off for ORR



Reference indicates the level of attribute patients are willing to tolerate (over other levels of attribute) for a hypothetical treatment that increases efficacy (ORR and OS) by the MRS margin. AEs, adverse events; CI, confidence interval; CAR-T, chimeric antigen receptor T-cell therapy; IV, intravenous; MRS, marginal rate of substitution; ORR, overall response rate; OS, overall survival; SC, subcutaneous

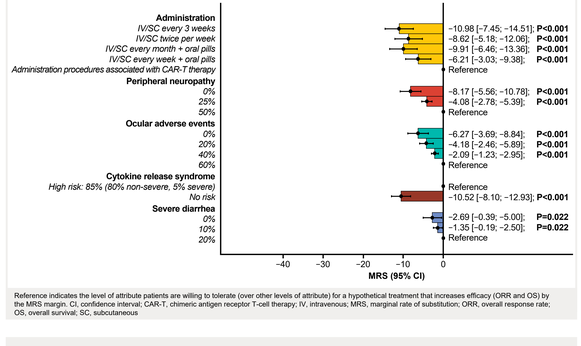
The trade-offs that patients were willing to make between increases in OS and changes in other attributes are shown in **Figure 6**.

In order to accept administration procedures associated with CAR-T over IV or SC Q3W administrations, patients would need to gain an 11-month increase in OS.

For AEs, patients would be willing to accept a high risk of CRS (over no risk) if the hypothetical treatment provided a 11-month increase in OS.

Similarly, patients would tolerate a 60% risk of ocular AEs (over no risk) in exchange for an additional 6 months gain in OS. Patients would also be willing to accept a 50% risk of peripheral neuropathy (over no risk) to gain 8 months of OS, or 20% risk of severe diarrhea (over no risk) to gain 3 months of OS.

Figure 6. Willingness to trade-off for OS



Reference indicates the level of attribute patients are willing to tolerate (over other levels of attribute) for a hypothetical treatment that increases efficacy (ORR and OS) by the MRS margin. CI, confidence interval; CAR-T, chimeric antigen receptor T-cell therapy; IV, intravenous; MRS, marginal rate of substitution; ORR, overall response rate; OS, overall survival; SC, subcutaneous

Conclusions

This large, robust, quantitative study reflects the voice of patients with RRMM in ≥3rd LOT. Treatment preferences of patients with RRMM were strongly driven by maximizing efficacy (ORR and OS), accounting for half of treatment decision making (half the total relative attribute importance), as patients were likely to trade off burdensome side effects and complex administration procedures for improvements in efficacy.

Patients generally preferred to avoid side effects including CRS, peripheral neuropathy, and ocular side effects; however, patients were willing to tolerate considerable increases in risks and complexity of administration in exchange for increased ORR or OS. Avoiding ocular AEs was less important to patients than administration procedures when considering treatment choices. These results should, however, be interpreted within the scope of the patient population.

Patients preferred SC or IV therapy administration in general but were willing to accept more demanding and burdensome administration methods for improved efficacy.

This study provides insights on patients' valuation of RRMM treatment attributes when provided with data outside of a clinical consultation and highlights the need for a shared decision-making process for optimal treatment selection.

Abbreviations

CAR-T, chimeric antigen receptor T-cell therapy; CI, confidence interval; CRS, cytokine release syndrome; DCE, discrete choice experiment; DoR, duration of response; IV, intravenous; LOT, line of therapy; MLE, maximum likelihood estimate; MM, multiple myeloma; MRS, marginal rates of substitution; ORR, overall response rate; OS overall survival; PI, proteasome inhibitor; Q3W, every 3 weeks; RAI, relative attribute importance; RRMM, relapsed/refractory multiple myeloma; SC, subcutaneous; UK, United Kingdom; USA, United States of America.

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Shivaranjani Naine contributed to the overall analysis, provided important intellectual content for poster development, and co-authored the abstract, but was unable to approve the final poster content.

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References

1. Sonneveld P. *Hematology Am Soc Hematol Educ Program*. 2017;2017:508–17.
2. Podar K, Leleu X. *Cancers*. 2020;13:5154.
3. Hernández-Rivas JÁ, et al. *Biomarker Research*. 2022;doi: 10.1186/s40364-021-00344-2
4. Fifer S, et al. *Patient Prefer Adherence*. 2020;14:1283–93.
5. Mühlbacher AC. *Eur J Health Economics*. 2011;12:193–203.
6. Fifer SJ, et al. *BMC Cancer*. 2020; 20:546.
7. Terpos E, et al. *Blood Cancer J*. 2021; 11:40.

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