EE735

Treatment Patterns and Economic Outcomes in Patients with Triple-class Exposed Relapsed/Refractory Multiple Myeloma (RRMM) in the US: A Real-World Claims Database Analysis

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INTRODUCTION

- Despite advances in therapy, multiple myeloma (MM) remains incurable, and patients inevitably experience relapse with progressively poorer outcomes. Treatment options for triple-class exposed patients are limited, highlighting the need for effective therapies that provide durable responses.[1,2]
- Patients with triple-class exposed RRMM, i.e., who have previously received proteasome inhibitors (PIs), immunomodulatory agents (IMiDs), and anti-CD38 monoclonal antibodies, face substantial clinical and economic burdens that are not well characterized.[3,4]
- The evolving landscape of 4L+ (fourth-line or higher) RRMM underscores the importance of understanding real-world treatment patterns, healthcare resource utilization (HCRU), and associated costs. Comprehensive contemporary evidence in this advanced setting remains scarce, representing a critical knowledge gap.
- This study aimed to describe treatment patterns, HCRU, and associated costs for the treatment of triple-class exposed RRMM using real-world US claims data.

METHODS

Study Design and Data Source

- We conducted a retrospective, observational cohort study using the US-based Optum de-identified Clinformatics® Data Mart (Jan 2015–Mar 2024), a healthcare claims database covering approximately 15 million members annually across commercial and Medicare Advantage plans, with over 180 million claims in total. The dataset includes both medical and prescription coverage.

Study Population

Inclusion Criteria:

- Adults (≥18 years) with a diagnosis of MM on or after Jan 1, 2015
- Exposure to ≥3 prior lines of therapy (LOTs), including a PI, IMiD, and anti-CD38 antibody (i.e., triple-class exposed)
- Initiation of ≥1 LOT post-triple-class exposure (the first LOT post-triple-class exposure is defined as the index LOT)

Exclusion Criteria:

- History of plasma cell leukemia

Treatment and Outcome Measures

- LOT sequences representing the chronological progression of treatments received by patients were determined using a pre-specified algorithm informed by literature and clinical expert input.
- For each LOT, total cost of care was calculated on a per-patient-per-month (PPPM) basis and reported by spending categories (i.e., outpatient services, pharmacy-dispensed medications, emergency room visits, and all-cause hospitalizations).
- Categorical variables were summarized as counts and percentages, and continuous variables as mean and median values.

RESULTS

Patient and Treatment Characteristics

- **Table 1** summarizes the baseline characteristics for the 289 4L+ triple-class exposed patients who were included in the patient cohort. At index, most patients were older (81% ≥65 years), and just over half were male (52.2%).
- The cohort was majority White (60.6%), with 16.6% identifying as Black, 3.1% as Asian, and 20.1% with race data either unknown or missing.

Table 1. Patient Characteristics at Index (n=289)

Characteristics	N (%) / Median (Range)
Age	
Median (Range)	74 (25-90)
< 65 years	55 (19.0%)
≥ 65 years	234 (81.0%)
Sex	
Female	138 (47.8%)
Male	151 (52.2%)
Race	
White	174 (60.6%)
Black	48 (16.6%)
Asian	9 (3.1%)
Missing/Unknown	58 (20.1%)
Number of Prior LOTs	
Median (Range)	3 (3-7)
3	223 (77.2%)
4	39 (13.5%)
5+	27 (9.3%)
Prior Stem-cell Transplant LOT	
1	58 (20.0%)
2	28 (9.7%)
3	20 (7.0%)
Follow-up Time (Months)	
Time from MM diagnosis to index	34 (8-102)
Follow-up time from Index LOT	8 (0-81)
Duration of index therapy, mean (SD)	5.6 (6.1)

LOT: Line of therapy

- Overall, patients had received a median of 3 (range: 3-7) prior LOTs.
- The majority (77%) were triple-class exposed after just 3 prior LOTs, indicating earlier exposure to PI, IMiDs, and anti-CD38 antibodies. The remaining 23% had received ≥4 prior LOTs, reflecting a subgroup with more complex treatment histories.
- The percentage of patients receiving stem-cell transplants (SCT) at 1L was 20.0%, with 9.7% at 2L and 7.0% at 3L.
- The median time from diagnosis to index LOT was 34 months, with a median follow-up of 8 (range: 0-81) months from index LOT.

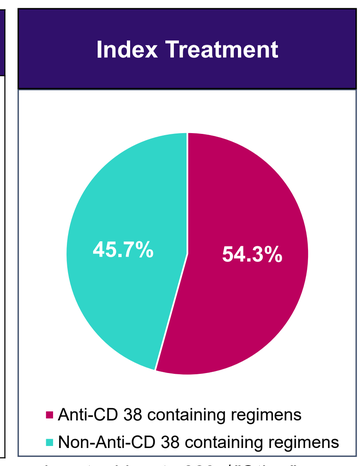
Treatments at Index

- **Figure 1** presents the classes of treatments at index. In this figure, each treatment regimen combines those with and without steroids
- Treatment patterns at index were highly heterogeneous, with anti-CD38-containing regimens as the most frequently used. The majority of treatment regimens at index required ongoing administration of multiple agents and did not allow for a treatment-free interval.
- Combinations with PIs and/or IMiDs were common, highlighting reliance on multi-drug strategies
- A high proportion of triple-class exposed patients were re-treated with a PI, IMiD, and/or anti-CD38.

RESULTS *(CONTINUED)*

Figure 1. Top 10 most frequently used index treatments

Most Used Index Treatments*	N (189/289)#	%
PI + IMID + anti-CD38	32	11.1%
PI + anti-CD38	32	11.1%
IMID + anti-CD38	24	8.3%
PI + IMID	21	7.3%
PI	17	5.9%
IMID	15	5.2%
PI + anti-CD38 + Other†	14	4.8%
IMID + Other†	12	4.2%
BsAb	11	3.8%
PI + anti-CD38 + Chemo	11	3.8%

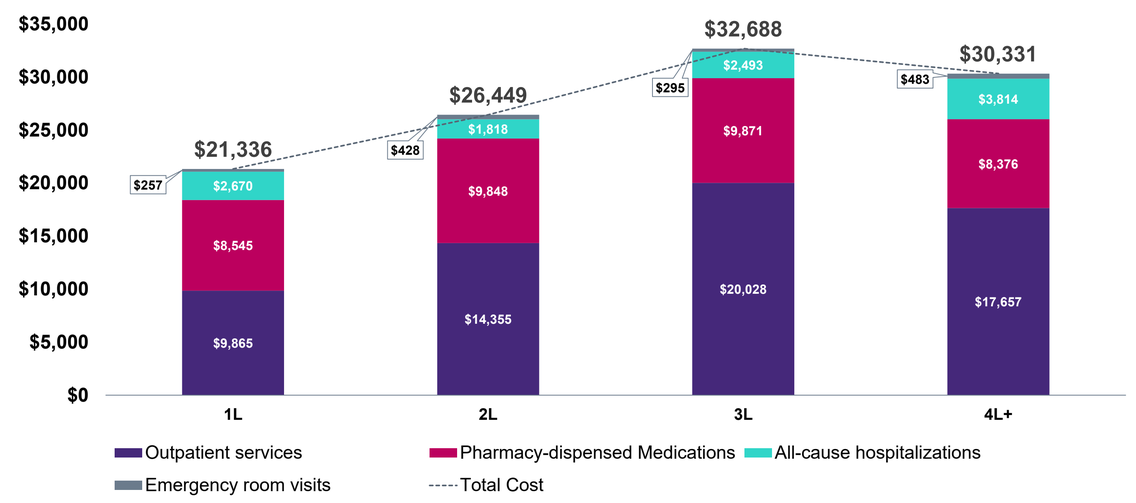


**May include steroids; #Since these are top 10 index treatments by frequency, the numbers do not add up to 289; †"Other" includes belantamab, clinical trial drugs, elotuzumab, panobinostat, venetoclax, and selinexor*
Anti-CD38: anti-CD38 monoclonal antibody; BsAb: bispecific antibody; IMiD: immunomodulatory drug; PI: proteasome inhibitor

Total Costs by Line of Therapy

- Total costs (PPPM), presented in **Figure 2**, increased with later lines of therapy, from $21,336 in 1L to $30,331 in 4L+ (+42% vs 1L).
- Outpatient services (including provider administered medications) consistently represented the largest share of total costs (46–61%) across LOT.
  - Outpatient services cost increased from $9,865 in 1L to $17,657 in 4L+ (+79% vs. 1L).
- Pharmacy-dispensed medication cost remained relatively stable across different LOT: $8,545 in 1L, $9,871 in 3L, and $8,376 in 4L+.

Figure 2. Total Costs by Spending Category and LOT (PPPM)



PPPM: Per patient per month; LOT: Line of therapy

- Emergency room (ER) visits accounted for a small portion of total costs across LOTs, ranging from $257 in 1L to $483 in 4L+ (+88%), with the highest cost observed in 4L+.
- All-cause hospitalization costs decreased from $2,670 in 1L to $1,818 in 2L (−32%) but rose again with subsequent lines to $3,814 in 4L+ (+43% vs 1L; +110% vs 2L). This pattern highlights the increasing burden of hospital-based care in later lines (**Figure 2**).

Limitations

- This analysis is based on claims data, which are not collected specifically for cost research. As a result, some healthcare encounters or services may be missing or incompletely coded, potentially leading to underestimation of costs and resource use.
- Potential miscoding or data entry errors may result in misclassification of treatment regimens.
- Finally, findings from this insured population may not be fully generalizable to the broader RRMM population, particularly those who are uninsured or underinsured.
- The elevated age and lower proportions of patients with prior SCT suggest that the study population skewed towards transplant ineligible patients, potentially limiting the generalizability of results.

CONCLUSIONS

- In the US, patients with RRMM who were triple-class exposed and initiated 4L+ therapy received heterogeneous treatment regimens, reflecting the lack of a defined standard of care in later LOT.
- A high proportion of triple-class exposed RRMM patients were re-treated with a PI, IMiD, and/or anti-CD38—classes they had previously failed in prior LOTs—reflecting lack of standard of care and low use of newer RRMM therapies, thus resulting in sub-optimal treatment.
- Patients with RRMM in later LOT incurred more healthcare costs, underscoring the growing economic and clinical burden in later LOT settings.
- Outpatient services and pharmacy-dispensed medication costs were the primary cost drivers across LOTs, highlighting the sustained resource requirements for managing and treating patients as they progress through successive LOTs.
- These findings highlight a persistent unmet need for more effective and durable therapies to improve outcomes, provide treatment-free intervals, and help reduce the overall clinical and economic burden for this population.

References

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Funding Disclosures: This study was funded by Arcellx, Inc. and Kite, A Gilead Company