# Impact of Moderate-To-Severe Chronic Kidney Disease on Outcomes After CAR-T Therapy in Multiple Myeloma: A Real-World Propensity Score–Matched Analysis

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## INTRODUCTION

- Renal dysfunction is common in multiple myeloma and often complicates treatment decisions.
- Patients with significant CKD have been underrepresented in pivotal CAR T-cell trials.
- Real-world safety and outcomes of CAR T-cell therapy in patients with **CKD stage ≥3a** remain incompletely characterized.
- We evaluated 3-year outcomes after CAR T-cell therapy in MM patients with versus without moderate-to-severe CKD

## METHOD

- Retrospective **TriNetX Global Collaborative Network** analysis of MM patients receiving CAR T-cell therapy from **2021–2023**.
- CKD cohort: **269 patients with stage ≥3a CKD**; control cohort: **1,850 without stage ≥3a CKD**.
- **1:1 propensity score matching** using demographics, MM-directed therapy, comorbidities, laboratory values, and medications.
- Outcomes assessed over **3 years**; **89 matched pairs** were analyzed.

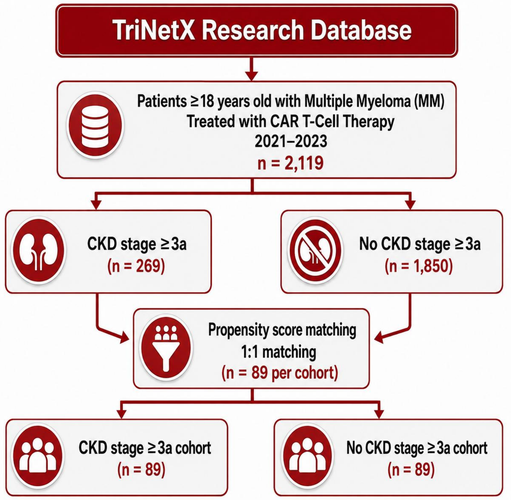
## CONCLUSIONS

- CKD stage ≥3a did not significantly increase mortality, CRS, ICANS, hospitalization, or ICU admission after CAR T-cell therapy in multiple myeloma.
- AKI was significantly more frequent with CKD, supporting CAR T-cell use with closer renal monitoring rather than exclusion based on CKD alone.

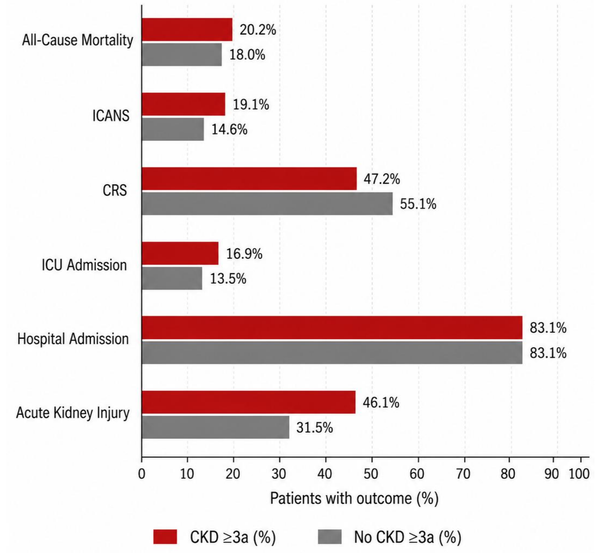
## Results

| After Propensity Score Match | | |
|---|---|---|
| **Characteristic** | **CKD stage ≥3a (n=89)** | **No CKD stage ≥3a (n=89)** |
| **DEMOGRAPHICS** | | |
| Current age, mean ± SD | 68.7 ± 8.6 | 69.2 ± 9.0 |
| Age at index, mean ± SD | 66.7 ± 8.7 | 67.0 ± 9.2 |
| Female, n (%) | 32 (36.0%) | 31 (34.8%) |
| Male, n (%) | 57 (64.0%) | 58 (65.2%) |
| **RACE / ETHNICITY** | | |
| White, n (%) | 60 (67.4%) | 57 (64.0%) |
| Black/African American, n (%) | 17 (19.1%) | 19 (21.3%) |
| Hispanic/Latino, n (%) | 10 (11.2%) | 10 (11.2%) |
| Asian, n (%) | 10 (11.2%) | 10 (11.2%) |
| American Indian/Alaska Native, n (%) | 10 (11.2%) | 10 (11.2%) |
| Other race, n (%) | 10 (11.2%) | 10 (11.2%) |
| **COMORBIDITIES** | | |
| Hypertension, n (%) | 63 (70.8%) | 69 (77.5%) |
| Cardiomyopathy, n (%) | 11 (12.4%) | 14 (15.7%) |
| Lipid disorders, n (%) | 49 (55.1%) | 52 (58.4%) |
| Ischemic heart disease, n (%) | 29 (32.6%) | 26 (29.2%) |
| Overweight/obesity, n (%) | 26 (29.2%) | 21 (23.6%) |
| Heart failure, n (%) | 24 (27.0%) | 19 (21.3%) |
| COPD, n (%) | 10 (11.2%) | 10 (11.2%) |
| End-stage renal disease, n (%) | 10 (11.2%) | 10 (11.2%) |
| Coagulation/hemorrhagic disorders, n (%) | 56 (62.9%) | 53 (59.6%) |
| Diabetes mellitus, n (%) | 25 (28.1%) | 24 (27.0%) |
| **MEDICATIONS / MYELOMA THERAPY** | | |
| Antilipemic agents, n (%) | 45 (50.6%) | 45 (50.6%) |
| Insulin, n (%) | 32 (36.0%) | 26 (29.2%) |
| Aspirin, n (%) | 61 (68.5%) | 59 (66.3%) |
| Bortezomib, n (%) | 38 (42.7%) | 38 (42.7%) |
| Daratumumab, n (%) | 49 (55.1%) | 43 (48.3%) |
| Carfilzomib, n (%) | 37 (41.6%) | 30 (33.7%) |
| Rituximab, n (%) | 10 (11.2%) | 10 (11.2%) |
| Venetoclax, n (%) | 10 (11.2%) | 10 (11.2%) |
| Ixazomib, n (%) | 10 (11.2%) | 10 (11.2%) |
| Elotuzumab, n (%) | 10 (11.2%) | 10 (11.2%) |
| Selinexor, n (%) | 10 (11.2%) | 10 (11.2%) |
| Isatuximab, n (%) | 10 (11.2%) | 10 (11.2%) |
| Teclistamab, n (%) | 10 (11.2%) | 10 (11.2%) |
| Cyclophosphamide, n (%) | 48 (53.9%) | 50 (56.2%) |
| Doxorubicin, n (%) | 16 (18.0%) | 12 (13.5%) |
| **LABORATORY VALUES** | | |
| LDL cholesterol, mean ± SD, mg/dL | 86.6 ± 31.1 | 82.6 ± 44.3 |
| Hemoglobin A1c, mean ± SD, % | 6.1 ± 1.3 | 6.1 ± 1.2 |

## Flow Chart

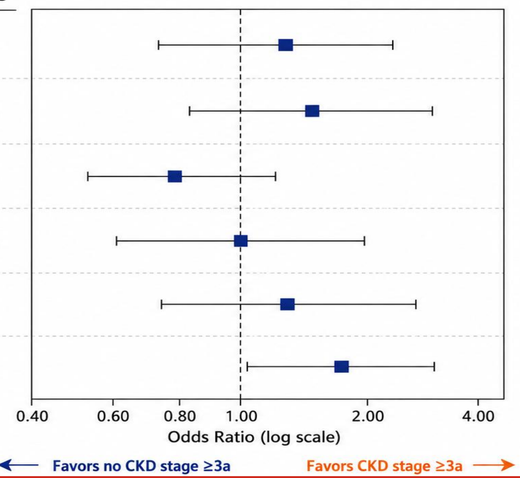



## Number of Events (%)




## Forest Plot

| Outcome | OR (95% CI) | p-value |
|---|---|---|
| **3-year all-cause mortality** | 1.157 (0.547–2.445) | 0.703 |
| ICANS | 1.380 (0.626–3.044) | 0.423 |
| CRS | 0.729 (0.405–1.315) | 0.294 |
| Hospitalization | 1.000 (0.456–2.192) | 1.000 |
| ICU admission | 1.301 (0.571–2.963) | 0.531 |
| **Acute kidney injury** | **1.861 (1.010–3.430)** | **0.046** |




Reference: Sidana S, et al. Idecabtagene vicleucel chimeric antigen receptor T-cell therapy for relapsed/refractory multiple myeloma with renal impairment. Haematologica. 2024