

Real-World Renal Toxicity and Survival Outcomes Following HSCT: A Propensity Score-Matched TriNetX Database Analysis of Total Body Irradiation versus Chemotherapy-Only Conditioning

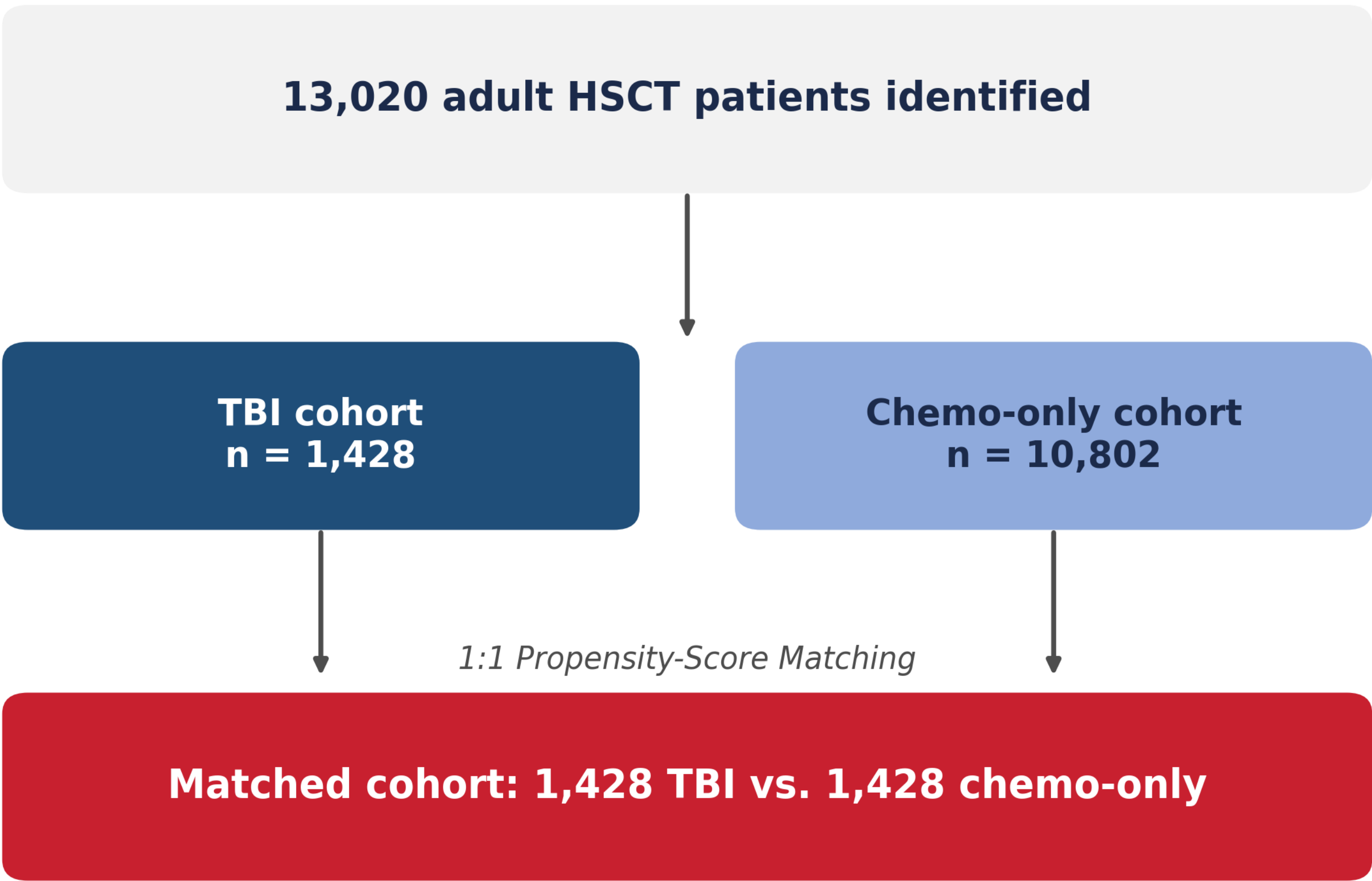
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INTRODUCTION

- Total body irradiation (TBI) is an established conditioning regimen for hematopoietic stem cell transplantation (HSCT), particularly in high-risk hematologic malignancies.
- Nephrotoxicity is a recognized complication of HSCT conditioning.
- The comparative real-world renal risk of TBI versus chemotherapy-only (chemo-only) conditioning remains incompletely characterized.

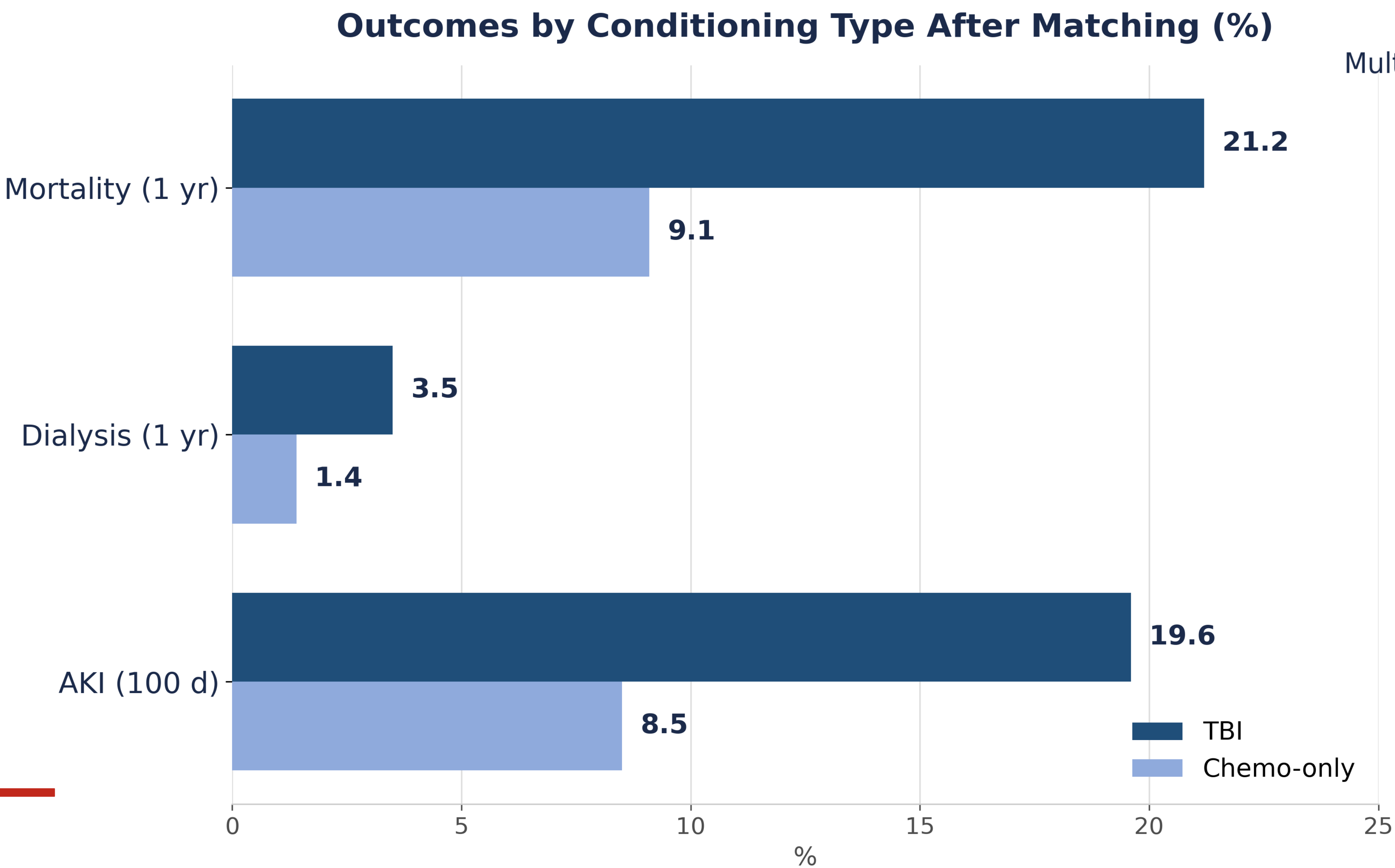
COHORT



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METHODS

- **Design:** Retrospective cohort study using the TriNetX US Collaborative Network (114M patients, 66 HCOs).
- **Population:** Adults (≥18 yrs) undergoing HSCT (CPT 38240, 38241).
- **Exclusions:** CKD stage ≥3, prior AKI (6 mo), prior solid organ transplant, age <18.
- **Matching:** Propensity-score matching to balance baseline characteristics.
- **Endpoints:** Primary – AKI (ICD-10 N17.x) within 100 days. Secondary – dialysis and all-cause mortality at 1 year.

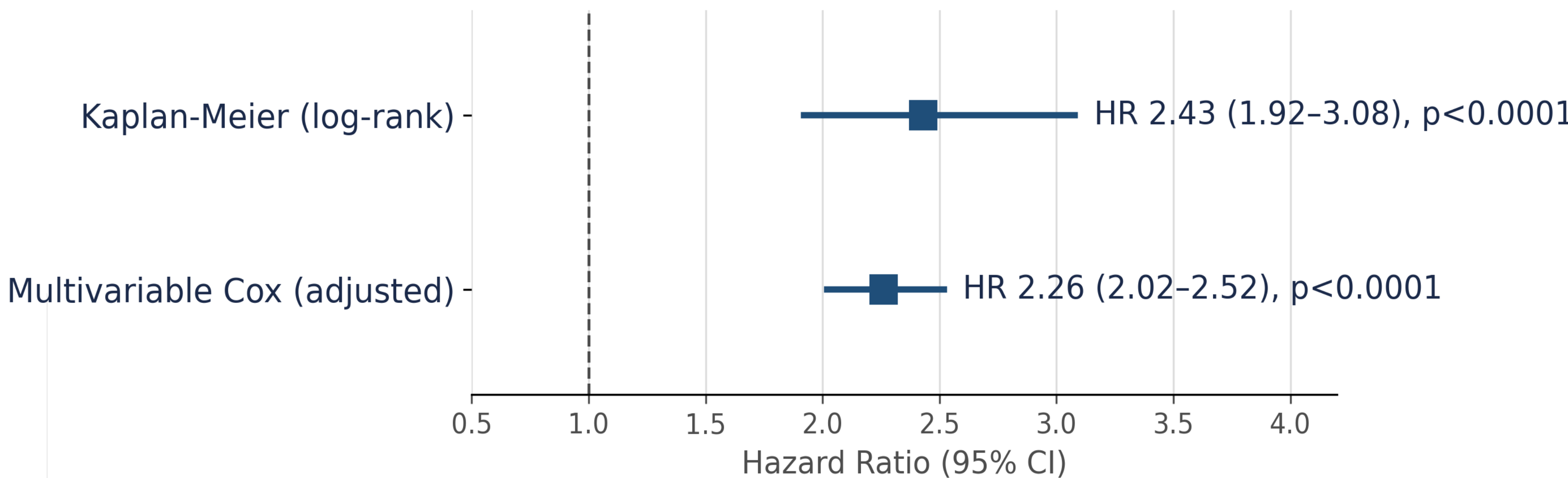


RESULTS

Outcome	TBI (%)	Chemo-only (%)	RR	P value
Acute kidney injury (100 days)	19.6	8.5	2.30	<0.0001
Dialysis (1 year)	3.5	1.4	2.46	0.0004
All-cause mortality	21.2	9.1	2.32	<0.0001

AKI = acute kidney injury; RR = relative risk. All outcomes reached statistical significance after 1:1 propensity-score matching.

AKI-Free Survival: Unadjusted vs. Adjusted Risk (TBI vs. Chemo-only)



CONCLUSIONS

- TBI-based conditioning was consistently associated with more than twice the risk of AKI, dialysis requirement, and 1-year mortality compared to chemo-only conditioning.
- Concordance across propensity-matched and multivariable Cox analyses strengthens confidence in these findings.
- The elevated mortality in the TBI arm – likely reflecting greater disease severity and indication bias – warrants interpretation in the context of competing risks.
- Proactive renal monitoring and nephroprotective strategies are warranted in TBI-conditioned HSCT recipients.