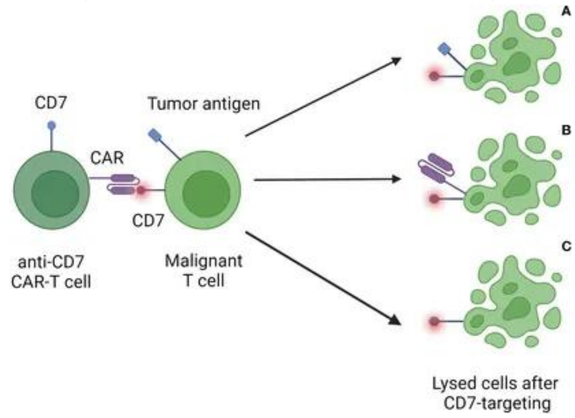
# Clinical Outcomes of CD7 CAR-T Cell Therapy in Relapsed or Refractory T-Cell Acute Lymphoblastic Leukemia: A Systematic Review

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## Background

T-cell acute lymphoblastic leukemia (T-ALL) is an aggressive hematologic neoplasm with poor outcomes in relapsed/refractory (R/R) cases. Chimeric antigen receptor (CAR) T-cell therapy has shown promise in B-cell malignancies, but faces challenges in T-ALL due to antigen overlap and fratricide. CD7, a surface glycoprotein expressed on T-ALL and T-LBL cells, is a promising therapeutic target. Advances in CAR-T cell engineering have enabled fratricide-resistant therapies.




## Objective

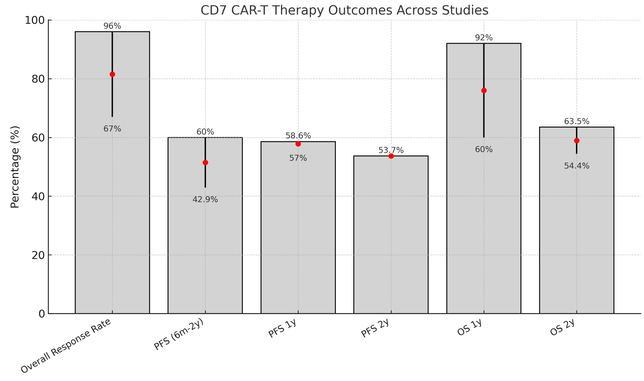
To systematically review the safety and efficacy of CD7 CAR-T cell therapy in patients with relapsed/refractory T-ALL and T-cell lymphoblastic lymphoma (T-LBL).

## Methods

A systematic literature search following PRISMA guidelines was conducted across PubMed, Google Scholar, and Cochrane Library for articles from 2015-2025. Studies included patients with R/R T-ALL or T-LBL who were positive for CD7 and received CD7 CAR-T cell therapy. Two reviewers screened titles, abstracts, and assessed outcomes related to efficacy and safety. Data was extracted on study design, patient numbers, response rates, survival, and adverse events like CRS, ICANS and cytopenia. Given heterogeneity in outcome reporting and study designs, a qualitative systematic review was preferred over quantitative meta analysis.

## Results

This systematic review included 7 clinical studies encompassing 192 patient who received CD7 CAR-T cell therapy for relapsed or refractory T-ALL or T-LBL.CD7 CAR-T therapy showed significant effectiveness with overall response rates of 67-96%, including complete remission and complete remission with incomplete hematologic recovery within 30 days. Progression-free survival at 6 months to 2 years was 42.9-60%, with 1-year rates of 57-58.6% and 2 year rate reaching up to 53.7%. One-year overall survival rates were 60-92%, while 2-year rates were 54.4-63.5% with better outcomes when followed by allogeneic HSCT. Common side effects included grade 1-2 cytokine release syndrome, with less frequent neurotoxicity (ICANS). Cytopenias and infections were also frequently observed. Although some patients experienced relapse, CD7 CAR-T therapy proved effective and well tolerated.




## Conclusion

CD7 CAR T-cell therapy shows promising efficacy and manageable safety in R/R T-ALL and T-LBL with high remission rate. Consolidation with allo-HSCT appears important for long-term survival. Larger studies with longer follow-up are needed to confirm these findings and guide its broader clinical application.

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## Acknowledgments

Thank you to collaborators and data providers.
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