

Efficacy and Safety of CAR-T Therapy in Relapsed/Refractory Chronic Lymphocytic Leukemia: A Systematic Review and Meta-Analysis

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INTRODUCTION

- Patients with relapsed/refractory (R/R) CLL progressing after BTK and BCL-2 inhibitors have poor outcomes and limited treatment options.
- CAR-T therapy has shown promise in B-cell malignancies, but its role in CLL remains under investigation.

AIM

- To systematically evaluate the efficacy and safety of CAR-T therapy in adults with R/R CLL/small lymphocytic lymphoma.

METHODS

- PubMed/MEDLINE and major ASH and ASCO conference proceedings through 2025 were systematically reviewed.
- Eligible studies evaluated CAR-T therapy in adults with R/R CLL/SLL.
- Random-effects meta-analysis generated pooled objective response rate (ORR) and CR/CRi estimates.
- Survival and safety outcomes were summarized descriptively.

CONCLUSIONS

- CAR-T therapy demonstrated meaningful efficacy in heavily pretreated, high-risk R/R CLL.
- Durable and MRD-negative remissions occurred in a subset of patients.
- Expected immune-mediated and hematologic toxicities were observed, while treatment-related mortality remained low.

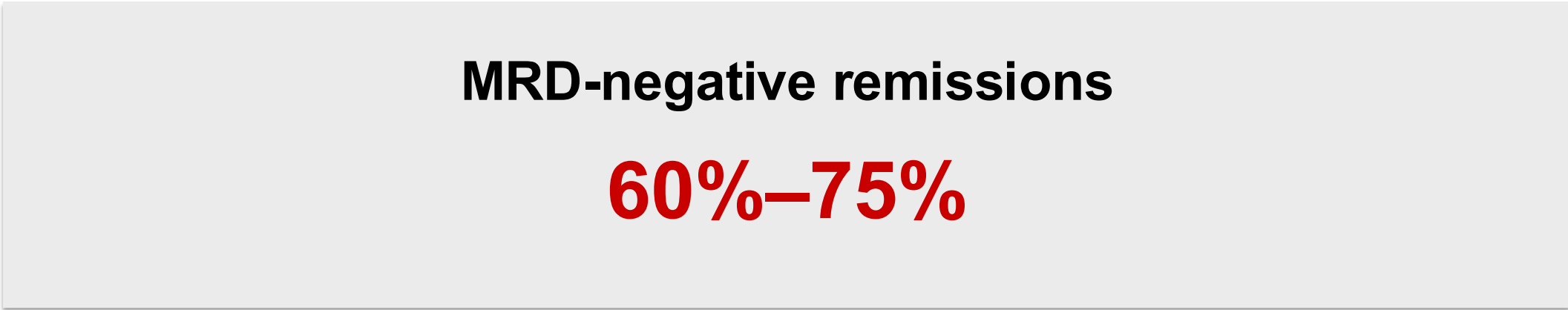
RESULTS

Study Characteristics

- 5 studies
- ≈120 patients
- Heavily pretreated population
- High-risk genomic features common
- TP53 aberrations and del(17p) represented

Median PFS
7–18 months

Pooled Efficacy



Meaningful responses were observed despite heavily pretreated, high-risk disease.

Safety Outcomes

Grade ≥3 CRS	9%–14%
Grade ≥3 neurotoxicity	20%–27%
Neutropenia	up to 53%
Thrombocytopenia	37%
Infections	up to 30%
Treatment-related mortality	3%–5%

KEY TAKEAWAYS

- Pooled ORR: 65%
- Pooled CR/CRi: 27%
- MRD-negative remission: 60%–75% of evaluated responders
- Low treatment-related mortality: 3%–5%

CONTACT INFORMATION

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REFERENCES

- PubMed/MEDLINE systematic review through 2025.
- American Society of Hematology and American Society of Clinical Oncology conference proceedings through 2025.
- Five included CAR-T studies in R/R CLL/SLL.