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Disease Context and Outcomes of Extracorporeal Membrane Oxygenation Among Adults With Hematologic Malignancies: A National ECMO Recipient Registry Analysis, 2016–2022

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1,650
Weighted ECMO admissions with a hematologic malignancy (2.0%)

50.3%
In-hospital mortality (95% CI 44.6–56.0%)

27.7
Mean length of stay days per hospitalization

$982K
Mean total charges per hospitalization ($981,982)

BACKGROUND

ECMO is increasingly used as rescue support for malignancy-associated critical illness. Contemporary national data describing the disease context and outcomes of ECMO recipients who have a hematologic malignancy remain limited.

OBJECTIVE

To characterize the disease context, organ-support burden, and inpatient outcomes of adult ECMO recipients with hematologic malignancies in the United States, and to compare in-hospital mortality across malignancy subtypes.

METHODS

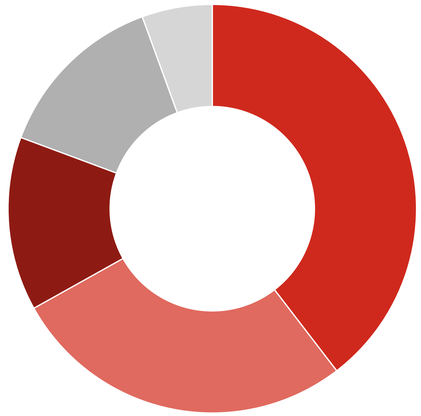
- **Design -** Retrospective, procedure-first ECMO recipient registry analysis.
- **Data source -** HCUP National Inpatient Sample (NIS), 2016–2022; all-payer U.S. inpatient hospitalizations.
- **Cohort -** Adult ECMO hospitalizations identified by ICD-10-PCS codes, then phenotyped for hematologic malignancy using ICD-10-CM diagnoses.
- **Subtypes -** Acute leukemia, other leukemia, lymphoma, myeloma, MDS/MPN, and other hematologic malignancy.
- **Analysis -** Survey weights, strata, and hospital clusters generated nationally representative estimates.
- **Outcomes -** ECMO volume, disease distribution, in-hospital mortality, length of stay, total charges, and concurrent organ-support diagnoses and procedures.

LIMITATIONS

- **Administrative** claims rely on ICD-10 coding and lack clinical and laboratory granularity; misclassification is possible.
- **Procedure-first** design characterizes context among ECMO recipients; it cannot estimate ECMO use across all hematologic-malignancy admissions.
- **Cell-size** suppression (HCUP) limits rare-subtype and fully stratified estimates.
- **In-hospital** outcomes only; total charges approximate resource use rather than actual costs.

RESULTS

Disease distribution

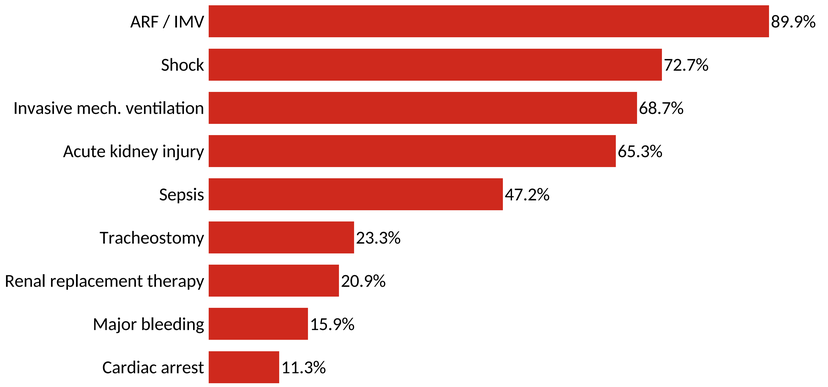


Subtype	Wtd n	%
MDS/MPN	645	39.1%
Lymphoma	445	27.0%
Acute leukemia	225	13.6%
Other leukemia	225	13.6%
Myeloma	90	5.5%
All Hematologic Malignancies	**1,650**	**100%**

MDS/MPN was the most common context (39.1%). Rare subtypes were suppressed per HCUP cell-size rules (≈20 weighted).

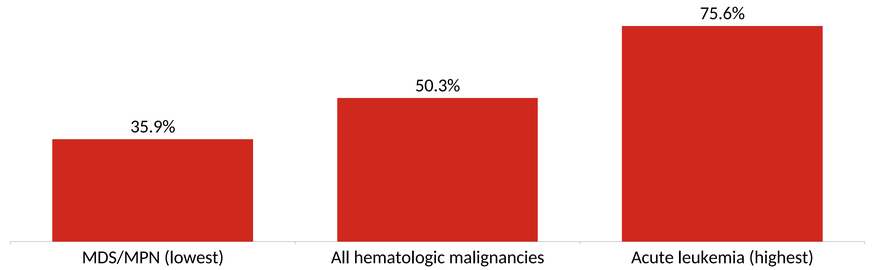
Organ-support burden

(% of hematologic-malignancy ECMO recipients)



ARF, acute respiratory failure; IMV, invasive mechanical ventilation; AKI, acute kidney injury; RRT, renal replacement therapy.

In-hospital mortality by disease context



Mortality ranged from 35.9% in MDS/MPN to 75.6% in acute leukemia, with 50.3% overall.

KEY TAKEAWAY
Roughly 1 in 2 patients did not survive to discharge - outcomes ranged from about 1 in 3 (MDS/MPN) to nearly 3 in 4 (acute leukemia).

CONCLUSIONS

- **Summary -** ECMO recipients with hematologic malignancies are a small but clinically complex group: ~2% of adult ECMO recipients (≈236/year), most often MDS/MPN or lymphoma.
- These patients require intensive multi-organ support - respiratory failure/IMV in ~90%, shock in ~73%, AKI in ~65%, and RRT or tracheostomy in ~1 in 5.
- Care is highly resource-intensive, with prolonged stays (mean 27.7 days) and nearly $1 million in mean charges per hospitalization.
- In-hospital mortality is high overall (50.3%) but varies markedly by subtype, from 35.9% in MDS/MPN to 75.6% in acute leukemia.
- Disease context is therefore central to prognostication and should inform individualized ECMO candidacy and goals-of-care discussions.
- **Future directions -** prospective multicenter studies integrating remission status and molecular risk, with post-discharge survival, functional outcomes, and cost-effectiveness, are needed to refine patient selection and guide shared decision-making.

DATA SOURCE · DISCLOSURES · CONTACT

Data source: HCUP National Inpatient Sample (NIS), AHRQ, 2016–2022.
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