Association Between Do-Not-Resuscitate Orders and In-Patient Outcomes in Hematologic Malignancies: A Nationwide Analysis

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Introduction

Hematologic malignancies (HM) carry a dismal prognosis, yet many patients receive high-intensity hospital care up until the end of life.

A documented do-not-resuscitate (DNR) order should, in principle, curb unwanted cardiopulmonary resuscitation, but its broader relationship to mortality, length-of-stay (LOS), and costs in this population remains unclear. This study explores this relationship to inform value-based, goal-concordant care.

Significance and Innovation

DNR orders are frequently associated with higher in-hospital mortality, but their impact on resource use is variable. Some studies show reduced interventions, while others suggest increased early intensity of care despite documented limitations. In HMs—where prognoses can be grim—early DNR decisions may influence care escalation, sepsis treatment, and discharge disposition.

This study will clarify whether DNR orders correlate with lower intensity and cost, or merely reflect higher acuity at baseline. Results may inform earlier palliative consults, goals-of-care discussions, and resource stewardship in relapsed/refractory HM.

Methods

We performed a retrospective, survey-weighted cross-sectional study of adult (≥18 y) HM admissions from the 2016-2020 National Inpatient Sample. Acute leukemias, lymphomas, multiple myeloma, and myeloproliferative neoplasms were identified by ICD-10-CM codes; DNR status by code Z66.

The primary outcome was in-hospital death; secondary outcomes were prolonged LOS (>7 d) and inflation-adjusted total hospital charges. Outcomes were evaluated with multivariable logistic regression (death, prolonged LOS) or a generalized log-linked linear model (charges), adjusting for demographics, payer, hospital characteristics, comorbidities, frailty, malnutrition, and sepsis.

Results

Among 3,066,994 weighted HM hospitalizations, 351,105 (11.5%) had DNR orders. DNR patients were older (mean 74.3 vs 58.1 y), more frequently White (77.7% vs 66.4%; P<0.001), and predominantly Medicare-insured (76.8% vs 48.7%; P<0.001). Unadjusted mortality was higher with DNR (24.0% vs 2.1%). After adjustment, DNR remained strongly associated with inpatient death (aOR 11.63, 95% CI 11.15-12.13; P<0.001).

DNR admissions were less likely to exceed 7 days (27.9% vs 37.3%; aOR 0.54, 95% CI 0.51-0.58; P<0.001) despite slightly longer mean LOS (8.66 vs 7.92 d). Mean charges were higher with DNR ($108,927 vs $100,009), and DNR independently added $12,295 per admission (β $12,295, 95% CI $9,693-$14,897; P<0.001). Sepsis (aOR 5.44; P<0.001) and malnutrition (aOR 1.71; P<0.001) further amplified mortality risk.

Impact of DNR Orders on Outcomes in Hematologic Malignancy Hospitalizations

Outcome	DNR vs Non-DNR (Crude)	Adjusted OR / β (95% CI)	P-value
Mortality	24.0% vs 2.1%	aOR 11.63 (11.15–12.13)	<0.001
LOS > 7 days	27.9% vs 37.3%	aOR 0.54 (0.51–0.58)	<0.001
Mean LOS	8.66 vs 7.92 days	-	-
Hospital Charges (Mean)	$108,927 vs $100,009	β $12,295 (95% CI $9,693–$14,897)	<0.001

Discussion

The study revealed critical racial disparities and predictors of worse mortality outcomes in TLS hospitalizations, like alcohol use, HIV status, and in-hospital complications.

In contrast, some predictors such as smoking, obesity, and female sex were associated with improved mortality outcomes. Future research should validate these findings and explore interventions targeting these significant predictors.

References

1. Wright, A. A., Zhang, B., Ray, A., Mack, J. W., Trice, E., Balboni, T., et al. (2008). Associations between end-of-life discussions, patient mental health, medical care near death, and caregiver bereavement adjustment. JAMA, 300(14), 1665–1673. https://doi.org/10.1001/jama.300.14.1665
2. Earle, C. C., Landrum, M. B., Souza, J. M., Neville, B. A., Weeks, J. C., & Ayanian, J. Z. (2008). Aggressiveness of cancer care near the end of life: Is it a quality-of-care issue? Journal of Clinical Oncology, 26(23), 3860–3866. https://doi.org/10.1200/JCO.2007.15.8253
3. McCulloch, M., Rathore, R., Clay, R., Gemmell, J., Lai, H., Stanners, C., et al. (2021). Health care utilization, end-of-life care, and survival among patients with hematologic malignancies: A population-based study. Cancer Medicine, 10(3), 1022–1030. https://doi.org/10.1002/cam4.3693
4. Hui, D., Kim, Y. J., Park, J. C., Zhang, Y., Strasser, F., Cherny, N., et al. (2014). Integration of oncology and palliative care: A systematic review. Journal of Pain and Symptom Management, 47(1), 77–89. https://doi.org/10.1016/j.jpainsymman.2013.04.019
5. Agency for Healthcare Research and Quality. (2022). HCUP National Inpatient Sample (NIS) 2020 introduction. Rockville, MD: Author. Retrieved from https://www.hcup-us.ahrq.gov/

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