



# Impact of Boarding Time on In-Hospital Mortality in Patients Presenting to an Oncologic Emergency Department of a Comprehensive Cancer Center

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## Background

Oncologic Emergency departments (EDs) play a crucial role in providing urgent, unplanned care for cancer patients. Ensuring smooth and safe transitions of care in this setting has become a key focus for improving both healthcare quality and patient safety.<sup>1</sup> Longer boarding time in general EDs has been associated with negative clinical outcomes, including higher mortality rates. Studies of boarding to date have been conducted in the general population but not the cancer population. In this study, we evaluated the association between mortality and boarding time in patients presenting at an oncologic ED.

## Methods

This retrospective study included all ED visits for patients 19 years and older who presented to The University of Texas MD Anderson Cancer Center ED between March 3, 2016, and December 31, 2022, with a disposition of hospital admission. Descriptive statistics were used to summarize the main characteristics. Univariate and multivariable logistic regression analyses were performed to determine the associations between boarding time and in-hospital mortality.

**Cancer patients with longer boarding time experienced higher mortality rates during their hospital admission**

## EMERGENCY

By the numbers:

- In-hospital mortality rate: 7.0% (n=3029)
- Median boarding time 2.7 hours.
- Boarding time of  $\geq 5.2$  hours was found to be a strong significant predictor of mortality ( $P < 0.001$ )
- Higher acuity and more comorbidities were also associated with poor survival

**BOARDING TIME, HIGHER ACUITY & MORE COMORBIDITIES MATTERS**

## Results

The final patient cohort included 43,308 patients. The median boarding time was 2.7 hours (interquartile range=1.5-5.2 hours), with an in-hospital mortality rate of 7.0% (n=3029). The median age and Charlson Comorbidity Index of the final cohort were 62 years (IQR=52–71) and 4 points (IQR=2–6), respectively. Sex was nearly equally distributed. Most of the cohort was White (70.5%), Black or African American (12.8%). Most patients were not Hispanic or Latino (81.5%) (Table 1).

**Table 1. Demographic characteristics of patients presenting at the ED.**

Characteristic	Number (%)
Total	43,308
Age, median (IQR), years	62 (52, 71)
Sex	
Female	20,796 (48.0)
Male	22,512 (52.0)
Race	
White or Caucasian	30,515 (70.5)
Black or African American	5529 (12.8)
Asian	2335 (5.4)
Multiracial, other race, or declined to answer	4929 (11.4)
Ethnicity	
Not Hispanic or Latino	35,295 (81.5)
Hispanic or Latino	6604 (15.2)
Unknown or declined to answer	1409 (3.3)
Charlson comorbidity index, median (IQR)	4 (2–6)

Patients with boarding times  $\geq 5.2$  hours had a 25% higher in-hospital mortality rate than did patients with  $< 1.5$  hours (odds ratio=1.25; 95% confidence interval=1.12–1.39;  $P < 0.001$ ).

**Table 1. Multivariable analysis of the association between clinical and demographic variables and in-hospital mortality.** \* Adjusted for age, sex and race

Variable	AOR* (95% CI)	P value
Charlson comorbidity index	1.08 (1.07-1.10)	<0.001
Boarding time		
<1.5 hours	Reference	
$\geq 1.5$ -<2.7 hours	1.14 (1.02-1.28)	0.018
$\geq 2.7$ -<5.2 hours	1.16 (1.04-1.29)	0.009
$\geq 5.2$ hours	1.23 (1.10-1.37)	<0.001
Acuity		
Level 3	Reference	
Level 2	1.74 (1.62-1.88)	<0.001
Level 1	3.49 (1.51-7.09)	0.001
Other	0.67 (0.33-1.20)	0.222

## Conclusions

Our study found that patients with longer boarding times in an oncologic ED were more likely to experience mortality during their hospital admission. These results emphasize the need for improved strategies to expedite the admission process and optimize care transitions for cancer patients in the ED to reduce mortality rates, especially for patients with complex medical needs and high-acuity presentations.

## References

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- 3) Al-Qahtani S, Alsultan A, Haddad S, et al. The association of duration of boarding in the emergency room and the outcome of patients admitted to the intensive care unit. BMC Emerg. Med. 2017;17:34.