



## Background

As more cancer patients with advanced disease present to the emergency department (ED), data on outcomes of cardiopulmonary resuscitation (CPR) are needed to help counsel patients before and during an acute event. Few studies have specifically looked at these data in an emergency department, where medical history is limited and the need for acute intervention often precludes discussion of therapeutic limitations. We investigated the characteristics of cancer patients who required CPR, their outcomes and how prior advanced care planning (ACP) influenced these outcomes.

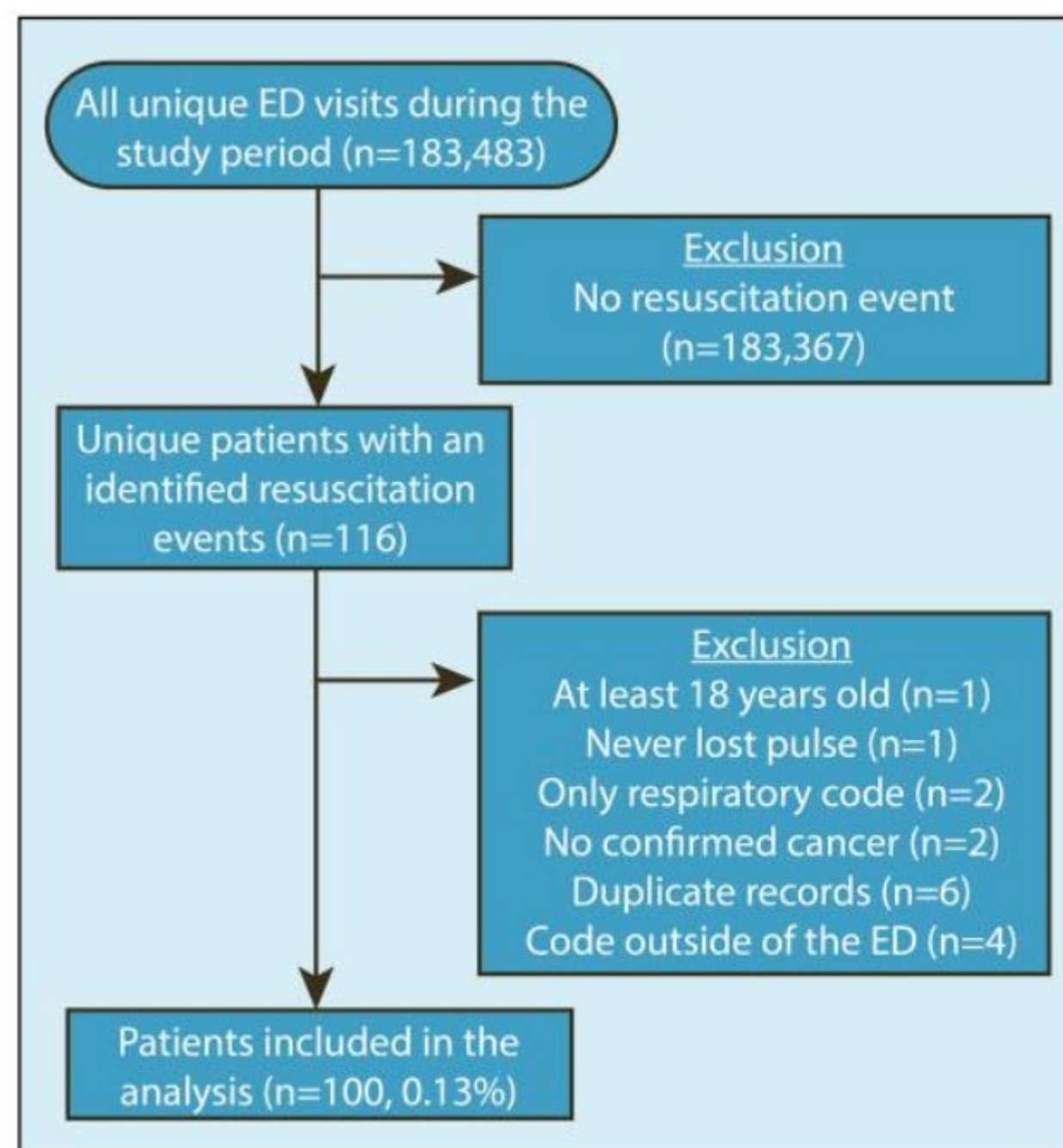


Figure 1. Study cohort flow diagram identifying patients with cancer who underwent resuscitation in the ED.

## Methods

We conducted a single-center, retrospective observational study using structured chart review for all patients with an identified malignancy, greater than 18 years of age who underwent CPR from March 6, 2016, through December 31, 2022, in the ED. Patients were included if they received chest compressions and/or electric cardioversion. Significance was appraised using chi-square tests, the Fisher exact test, the Student t-test, or nonparametric tests. Survival rates were estimated using Kaplan-Meier survival analysis for the whole cohort followed by a log-rank test.

Table 2. Cancer-related factors in patients with cancer who were resuscitated in the ED (N = 100).

Variable	n (%)
Cancer type	
Gastrointestinal	17 (17.0)
Lung	16 (16.0)
Leukemia	14 (14.0)
Head and neck	13 (13.0)
Other hematologic*	11 (11.0)
Genitourinary	9 (9.0)
Gynecologic	7 (7.0)
Breast	4 (4.0)
Sarcoma	3 (3.0)
Brain and spinal cord	2 (2.0)
Melanoma and other skin	2 (2.0)
Endocrine	1 (1.0)
Other	1 (1.0)
Distant metastasis at the time of presentation †	
No	25 (34.2)
Yes	48 (65.8)
Received cancer therapy within 2 months before CPR event	
No	15 (15.0)
Yes	85 (85.0)

\* Hematologic cancers besides leukemia. † Excluding patients with hematologic or central nervous system cancers (n = 73).

## Results

Over the 7-year period, a cardiopulmonary resuscitation event only occurred in 100 (0.13%) of 74,896 unique patients and 0.05% of the 183,483 ED visits. Of these 100 patients, 67 achieved ROSC, with 15% surviving to hospital discharge. The median survival was 26 hours, and the 30-day mortality rate was 89%. Patients with and without prior ACP had no significant differences in demographics, metastatic involvement, achievement of ROSC or in-hospital mortality, but patients with ACP were more likely to change their code status to DNR and had shorter stays in the ICU or hospital.

Table 1. Demographics and clinical characteristics stratified by ACP or GOC documentation prior to the resuscitation event for the patients who achieved ROSC (N = 67).

Variable	ACP or GOC documentation before the event		P
	No (N = 36)	Yes (N = 31)	
Age in years, mean ± SD	60.75 ±13.65	60.23 ±10.18	0.861
Sex			0.169
Female	16 (44.4)	19 (61.3)	
Male	20 (55.6)	12 (38.7)	
Race			0.826
Non-White	13 (36.1)	12 (38.7)	
White	23 (63.9)	19 (61.3)	
Ethnicity			0.547
Hispanic or Latino	5 (13.9)	6 (19.4)	
Neither Hispanic nor Latino	31 (86.1)	25 (80.6)	
CCI score, median [IQR]	6 [5-7]	8 [6-11]	0.013
Distant metastasis at the time of presentation*			0.382
No	11 (40.7)	6 (28.6)	
Yes	16 (59.3)	15 (71.4)	
Active cancer therapy			0.471
No	7 (19.4)	4 (12.9)	
Yes	29 (80.6)	27 (87.1)	
Code status changed after resuscitation			0.039
No	14 (38.9)	5 (16.1)	
Yes	22 (61.1)	26 (83.9)	
Time to ROSC† in minutes, median [IQR]	14 [6-21]	10 [6-19]	0.525
In-hospital mortality			0.529
No	8 (22.2)	5 (16.1)	
Yes	28 (77.8)	26 (83.9)	
ICU length of stay in days, median [IQR]	2.25 [0.73-13.54]	0.92 [0.29-6.88]	0.028
Hospital length of stay in days, median [IQR]	2.60 [0.94-17.29]	1.17 [0.42-7.96]	0.046
Total cost of hospital stay in US\$, median [IQR]	50,567 [20,951-213,103]	44,402 [25,795-134,974]	0.904
Time to death in hours, median [IQR]	42 [7-188]	8 [5-93]	0.080*

Data reported as n (%) unless specified otherwise.  
\*Only for patients with solid tumors.

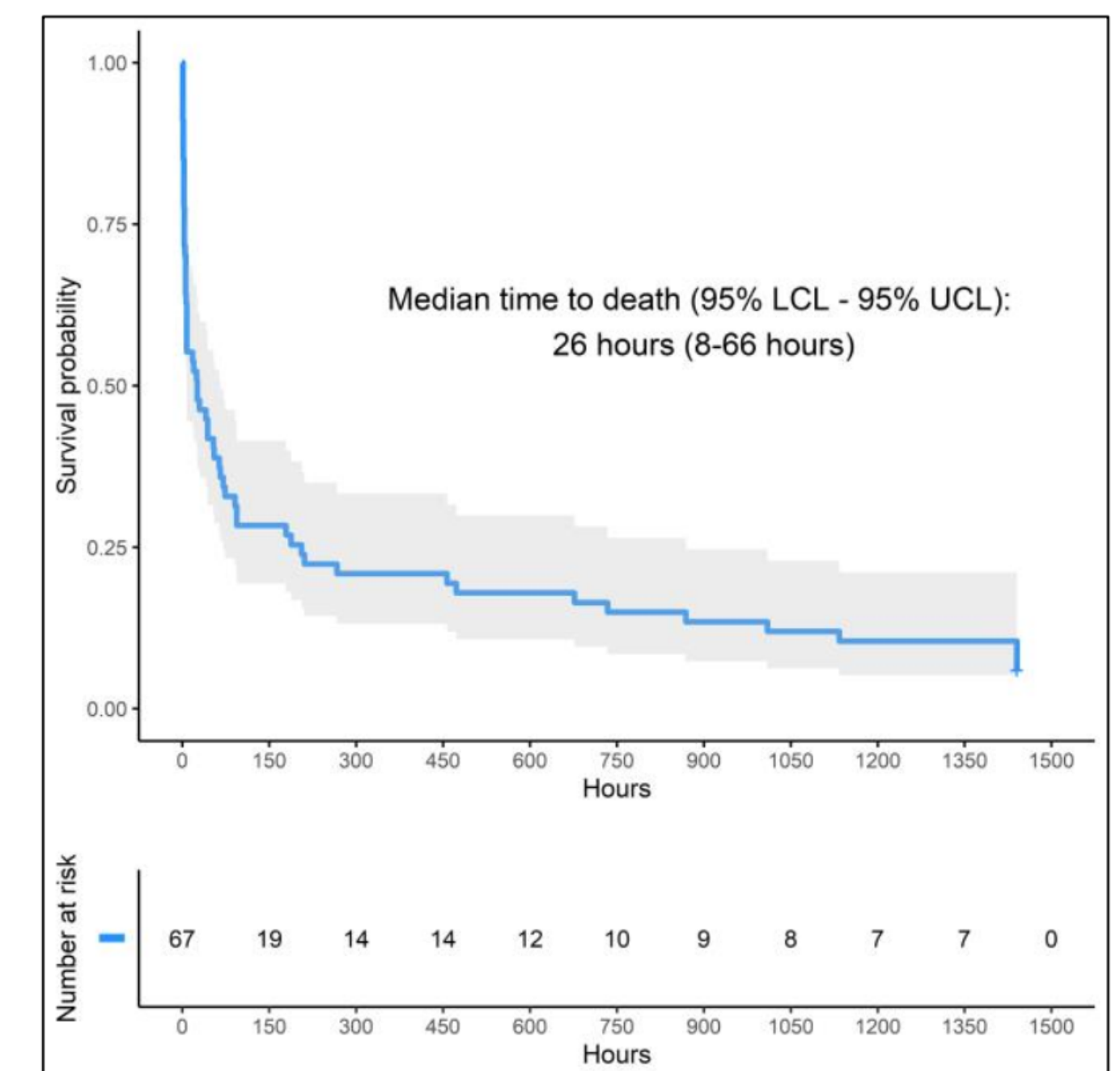


Figure 2. Median time to death for patients with cancer who had ROSC in the ED.

## Conclusion

Few cancer patients undergo CPR in the ED. Whether this results from an increase in terminally ill patients choosing DNR status requires further study. ACP was associated with increased conversion to DNR after resuscitation and decreased hospital or ICU stays without an increase in overall mortality. ACP discussion may shorten hospitalization for resuscitated patients by preparing patients and their families to opt for a palliative approach earlier. These findings may assist providers in managing expectations and ensuring that patient and family goals align with the realities of cardiopulmonary arrest outcomes.