



## ICU Costs Higher for Patients Dying Before Discharge



The high cost of critical care has engendered research into identifying influential factors. However, previous studies have not considered patient vital status at ICU discharge. This is what a new study has found: The largest drivers of ICU costs at the patient level are day 1 room occupancy and day 1 mechanical ventilation, and mortality before unit discharge is associated with substantially higher costs.

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"Patients who did not survive their ICU stay had a 12% increase in overall costs. The increase was most evident for patients with an extended ICU stay who were receiving mechanical ventilation," according to researchers. "Studies evaluating costs among ICUs need to take mortality into account."

To date, most studies evaluating the cost of a patient's ICU stay either used administrative data or were completed over a decade ago. They demonstrated that costs are highly influenced by the following factors: age, diagnosis (especially cardiac conditions), hospital teaching status, higher utilisation of services, length of stay in the ICU (ICULOS), and receiving mechanical ventilation. However, there may be additional patient-specific factors that impact cost. These include, among others, severity of illness, time on mechanical ventilation, the ICU admitting diagnosis, and whether or not the patient survived to ICU discharge.

The present study – covering 26 ICUs at 13 hospitals in the U.S. – attempted to explore the association between ICU discharge status and total costs in a large patient cohort. The objective was to develop a multivariable model that incorporated previously defined factors such as ICULOS, mechanical ventilation, diagnosis, and age to determine if death before ICU discharge had a distinct impact on the total cost of an ICU stay. Data for 58,344 admissions from 1 January 2012 through 30 June 2016, at the 13 hospitals, were obtained from a commercial ICU database.

The median observed cost of a unit stay was \$9,619 (mean = \$16,353). A multivariable regression model was developed on the log of total costs for a unit stay, using severity of illness, unit admitting diagnosis, mortality in the unit, daily unit occupancy (occupying a bed at midnight), and length of mechanical ventilation. This model had an "r<sup>2</sup>" of 0.67 and a median difference between observed and expected costs of \$437. The first few days of care and the first day of receiving mechanical ventilation had the largest effect on total costs.

"What might account for mortality being associated with higher costs? Since we adjusted for severity of illness, diagnosis, and a patient receiving mechanical ventilation, the higher costs associated with patient death cannot be attributed to case-mix. The most likely explanation lies in the considerable number of resources incurred at

the end of life. Care before end of life may include additional procedures, diagnostic tests, and laboratory tests," the authors explain.

They also note the prolonged use of such therapies as IV vasopressors, blood products, sedatives, and analgesics as needed for the patient to die with dignity while receiving comfort care. Moreover, terminal patients with a do not resuscitate order might continue to receive mechanical ventilation and as needed comfort care while languishing in the unit, resulting in an extended LOS and associated costs of care.

Source: [Critical Care Medicine](#)

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