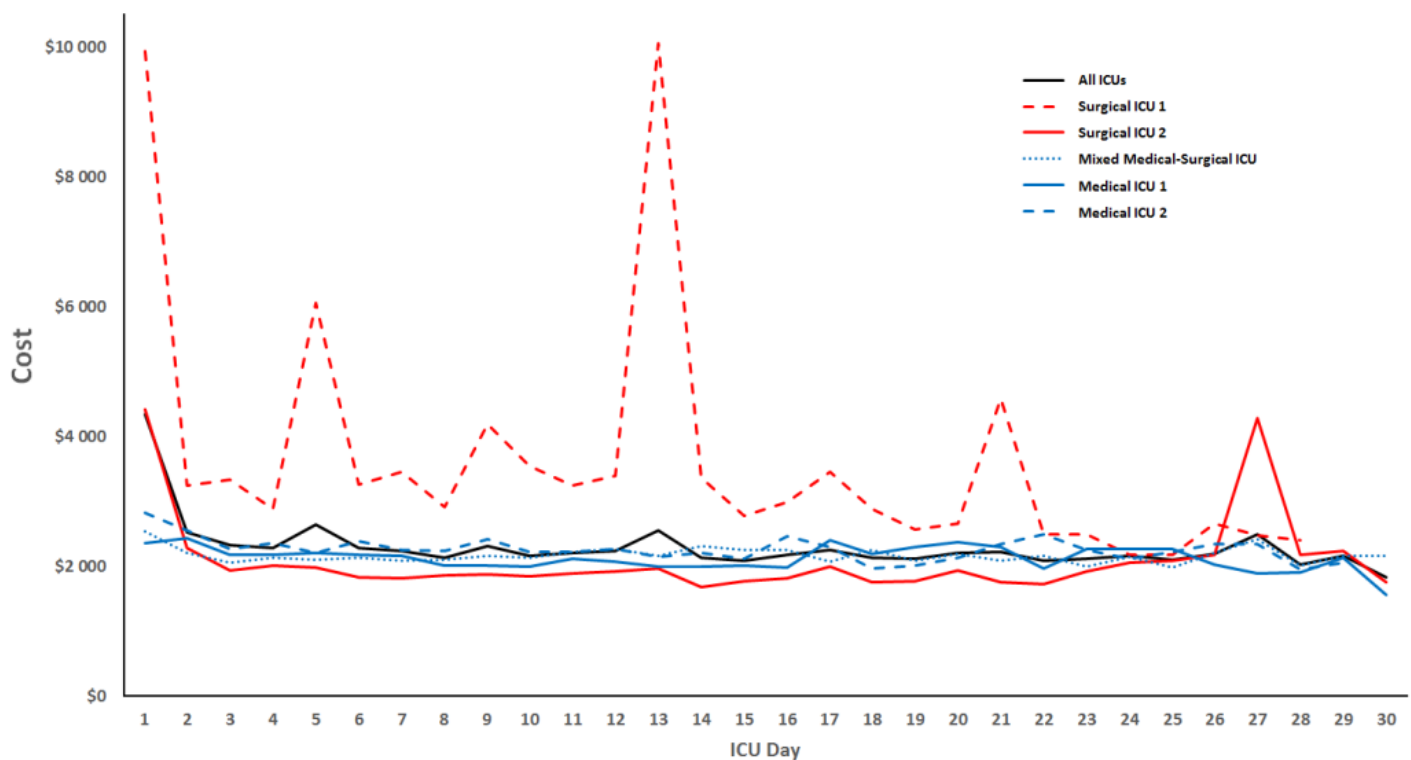


Daily costs were higher on day 1 than on subsequent days for surgical ICU patients

Not all hospital beds are created equal. In the most basic case, a hospital may have beds on a general ward and beds in an intensive care unit (ICU). The main difference between these two locations is the level of monitoring; in the ICU there are continuous monitoring devices (e.g., automated blood pressure measurements) and each nurse cares for fewer patients. Patients are triaged to a given hospital bed based on the severity and character of their illness and the degree of monitoring they are anticipated to need. In large part because of this increased monitoring, caring for a patient in the ICU is more costly to the hospital than caring for a patient on a general ward.

Interestingly, previously published studies suggest hospital costs on day one in the ICU far exceed those of subsequent days when costs are relatively stable. In each of these studies, however, financial data for patients from all types of ICUs (e.g., medical patients only, surgical patients only, mixed medical and surgical populations, etc.) were combined. We hypothesized that this observed cost pattern of higher hospital costs on day one in the ICU may not be present across all ICU types.



To investigate our hypothesis we performed a retrospective study of adults admitted to 5 ICUs (two surgical, two medical, and one mixed medical and surgical) at an academic medical center in the

New York City during 2013. Consistent with published literature, day one costs in the two surgical ICUs were significantly higher than costs on day two (Figure 1). In the three non-surgical ICUs, however, costs did not go down after day one. To ensure that these different patterns of cost were not explained by known differences in patient characteristics (e.g., age, severity of acute illness) across unit types, we used a statistical technique (multivariate regression) to adjust for known differences in patients in each ICU which might impact daily cost. After these adjustments, the differing patterns of daily costs for the surgical versus non-surgical ICUs remained. Interestingly, we found that the largest contributors to day one versus subsequent day costs in the surgical ICUs were costs associated with blood bank, laboratory, medical/surgical supplies, and respiratory therapy usage—many of which may have accrued in the operating room prior to ICU admission.

Our findings are not inconsistent with previously published studies and serve primarily to refine what is known about daily hospital costs for ICU patients. Three prior studies have demonstrated trends in daily costs similar to our surgical ICUs. In one, however, more than half of the evaluated cohort was admitted to a surgical ICU and, in a second, medical and surgical ICU patients were evaluated together. In the third, in which the average daily cost for all ICU patients decreased, the steep drop from day 1 to day 2 was blunted for medical patients compared with surgical and trauma patients. Our findings are not in conflict with published literature, therefore; rather, our results suggest that it may be the surgical ICU patients driving the composite daily cost trends observed in prior studies.

Budgeting for ICUs and estimating the impact of novel ICU-based interventions require precise knowledge of daily costs. Moreover, understanding the impact of ICU length of stay reductions on hospital costs relies on accurately assessing the difference in costs between one patient's last ICU day and the next patient's first. Our findings clearly demonstrate that when estimating the potential impact on cost of interventions which affect a patient's number of days in the ICU, assumptions about daily ICU costs should take into account the type of ICU being targeted.

Publication

[Patterns of Daily Costs Differ for Medical and Surgical Intensive Care Unit Patients.](#)

Gershengorn HB, Garland A, Gong MN

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