

# The Clinical Impact of Increased Tele-ICU Utilization

## Overview

A range of factors influence the effectiveness of a tele-ICU in improving clinical outcomes in a hospital. One of the most observable, most directly manageable, and also most overlooked factors is the utilization of tele-ICU providers in active patient care. Data drawn from several analyses indicate that the mere availability of tele-intensivists available does not drive optimal clinical performance. Rather, their on-going collaboration with – and utilization by – bedside clinicians further improve key outcomes.

Case data were drawn from three different tele-ICU situations to evaluate the clinical impact of tele-intensivist utilization:

1. Cohort evaluation of high-utilization hospitals in comparison to the Hicuity Health all-hospital average
2. Results at a single hospital as its intervention rate changed over time, driven by changes in technology, and
3. Comparison of systems with significant variance in utilization rates.

Each evaluation reinforces the conclusion that tele-ICU clinical utilization matters, as it is consistently associated with differential performance on key tele-ICU clinical outcomes such as mortality, length of stay, and best practice compliance.

## Optimizing the Clinical Impact of the Tele-ICU

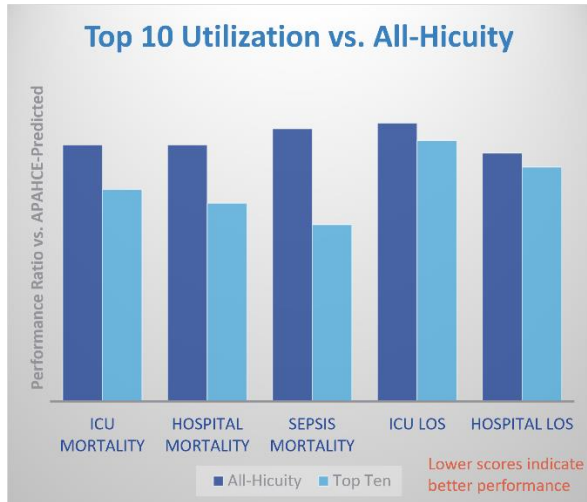
The launch of a tele-ICU is typically driven by a focus on improving clinical outcomes in the ICU. The logic and evidence are clear: the availability of tele-intensivists to lead the care of critically ill patients improves outcomes, a conclusion supported by a range of academic studies as well as hospital assessment scoring compiled by The Leapfrog Group.

While Hicuity's in-market experience supports these conclusions, it also highlights that the ready availability of a tele-intensivist improves care relative to having no intensivist available but does not on its own optimize care. Rather, experience across a range of client environments details that active utilization of the tele-intensivist and collaboration with the bedside clinical team in direct patient care improves clinical results.

## Top Utilization Hospitals Outperform the Field

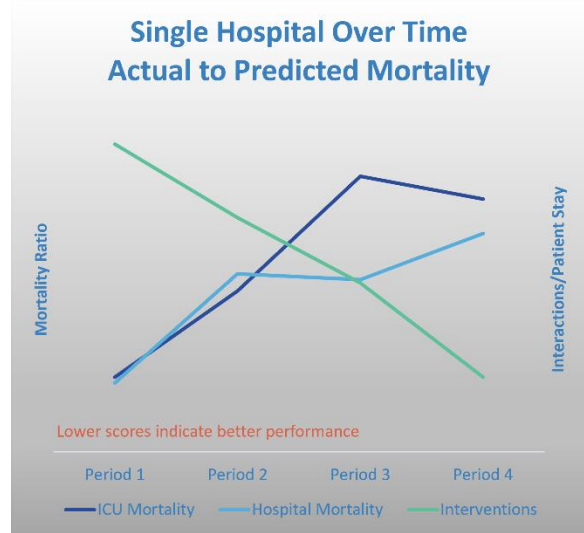
Hicuity Health's partnering to deliver tele-ICU care at upwards of 100 facilities nationwide enables benchmarking analysis within our client network. A First Quarter, 2023 analysis compared the clinical performance of a cohort of the Top 10 Hicuity partner hospitals in terms of tele-intensivist utilization rate against the company's all-hospital average, with utilization

measured by the average number of provider interventions per patient stay. The tele-ICU care model and the availability of the tele-ICU team was largely consistent across all hospitals; therefore, the tele-ICU utilization can be largely attributed to the differences in bedside team collaboration. A strong association of utilization with key clinical metrics was clear. The APACHE benchmarking tool was used to assess clinical performance using observed vs. predicted ratios for ICU and Hospital LOS and mortality. Hospitals that were in the Top 10 in intensivist utilization outperformed the average hospital on key clinical metrics by 5 to 35 percentage points. On two of the most central ICU metrics, the top hospitals reduced the average ICU length of stay by 6 percentage points in comparison to the all-hospital average and reduced ICU mortality rate by 16 points as well.



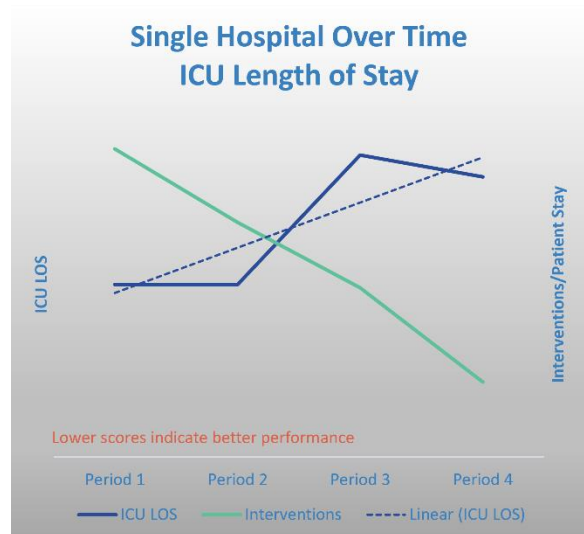
### A Hospital's Clinical Results Change as Does Its Tele-Intensivist Utilization

A second study evaluated the impact of tele-intensivist utilization at a specific hospital as clinical behavior changed over time. In this setting, the hospital was forced to transition tele-ICU care from wired ICU rooms to tablet technology that did not allow patient care to be initiated by the tele-ICU intensivist. This technology-driven change enabled comparison of continuous monitoring tele-ICU care that includes proactive intervention with an episodic version in which tele-intensivists could only respond to bedside-initiated interactions. As expected, the tele-ICU intervention rate dropped dramatically.



We studied the effect of the lower intervention rate with two common mortality ratios: 1) ICU mortality, and 2) all-hospital mortality for patients with an ICU stay. We found a very strong negative trend in each mortality ratio as tele-intensivist utilization declined.

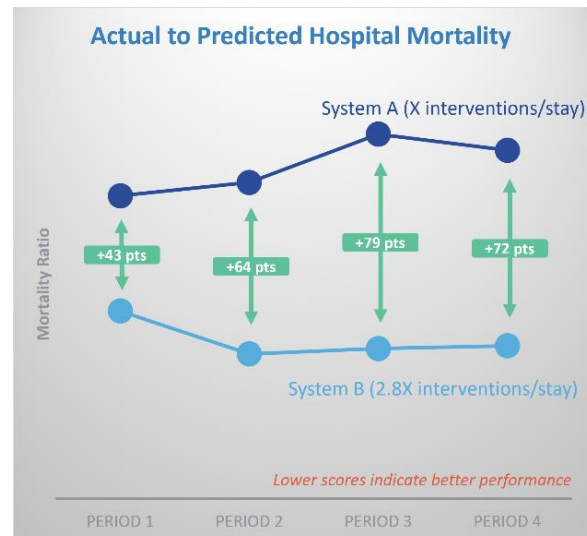
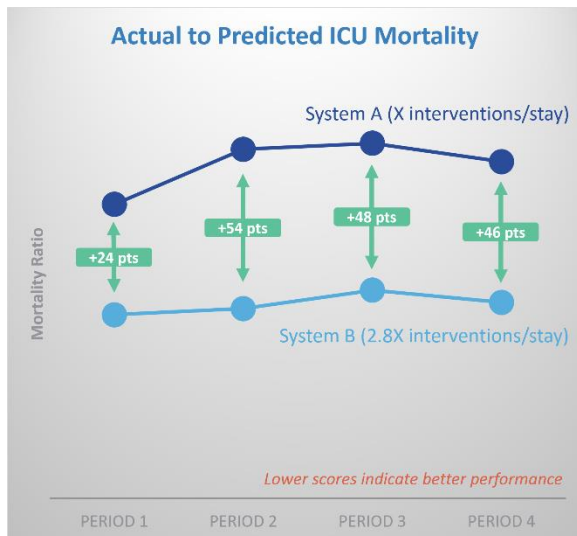
A second analysis at this hospital studied the length of stay for ICU patients in comparison to changes in tele-intensivist utilization. A strong inverse association again was clear. Both analyses at this hospital identify a strong inverse association of key clinical outcomes with decreased tele-intensivist utilization. They also point to the significant impact of telehealth technology choices on determining clinical collaboration, and therefore, outcomes. (Based partly on this analysis, the facility is now reverting to wired technology.)



## A Tale of Two Systems Highlights the Impact of Tele-ICU Utilization

A third look at the value of tele-intensivist utilization compared two hospital systems with dramatically different rates of tele-ICU interventions. The higher utilization relationship was associated with 2.8 times the clinical interventions by a tele-intensivist per patient stay when compared to a second, lower-utilization system.

Using a ratio of actual-to-predicted ICU mortality, the - tele-ICU relationship that included a higher intervention rate performed materially better, delivering an ICU mortality ratio 24 to 54 percentage points better in each quarter. In evaluating whole-hospital mortality for those patients that had been in the ICU, higher tele-ICU utilization correlated with mortality ratio reductions of 43 to 79 percentage points per quarterly period.



## Summary

Optimal performance for a tele-ICU relationship is not simply a matter of ensuring intensivists are available. In-market experience, as well as observational studies, highlight the role of the utilization and involvement of the tele-ICU intensivist. Creating a cohesive, collaborative relationship between the bedside and tele-ICU clinical teams, as well as relying on the skill of the tele-intensivist as an active clinician rather than simply on-call resource, delivers better clinical results on the key clinical outcomes: mortality and patient length of stay.

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