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## FEATURE ARTICLES

# Effect of a mu program on c paradigm for

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The addition of a supplemental, telemedicine-based, remote intensivist program was associated with improved clinical outcomes and hospital financial performance.

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## Abstract

### Objective

To examine whether a supplemental remote intensive care unit (ICU) care program, implemented by an integrated delivery network using a commercial telemedicine and information technology system, can improve clinical and economic performance across multiple ICUs.

### Design

Before-and-after trial to assess the effect of adding the supplemental remote ICU telemedicine program.

### Setting

Two adult ICUs of a large tertiary care hospital.

### Patients

A total of 2,140 patients receiving ICU care between 1999 and 2001.

### Interventions

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ng financial analysis.

The remote care program used intensivists and physician extenders to provide supplemental monitoring and management of ICU patients for 19 hrs/day (noon to 7 am) from a centralized, off-site facility (eICU). Supporting software, including electronic data display, physician note- and order-writing applications, and a computer-based decision-support tool, were available both in the ICU and at the remote site. Clinical and economic performance during 6 months of the remote intensivist program was compared with performance before the intervention.

## Measurements and Main Results

Hospital mortality for ICU patients was 12.9% (95% CI, 11.6–14.3) vs. 12.9% (95% CI, 11.6–14.3) for patients not in the ICU. Relative to patients not in the ICU, the relative risk of death was 1.03 (95% CI, 0.73–1.45) for patients in the ICU. The mean length of stay was 3.21 days (95% CI, 3.21–4.04) vs. 4.35 days (95% CI, 4.35–4.35) for patients not in the ICU. The mean hospital charges were \$10,000 (95% CI, \$10,000–\$10,000) vs. \$10,000 (95% CI, \$10,000–\$10,000) for patients not in the ICU. The mean hospital revenues were \$10,000 (95% CI, \$10,000–\$10,000) vs. \$10,000 (95% CI, \$10,000–\$10,000) for patients not in the ICU.

## Conclusions

The addition of a supplemental intensivist program improved clinical outcomes for ICU patients similar to those reported for other telemedicine staffing models; however, the program also contributed to the observed increase in hospital charges and length of stay. The focus on ICU performance in this multiple-site program, in addition to the use of telemedicine, may provide a means for hospitals to improve ICU care using fewer intensivists.

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6 vs. 12.9%; relative risk of death was 1.03 [95% CI, 0.73–1.45]; mean length of stay was 3.21 days [95% CI, 3.21–4.04] vs. 4.35 days [95% CI, 4.35–4.35]; mean hospital revenues were \$10,000 [95% CI, \$10,000–\$10,000] vs. \$10,000 [95% CI, \$10,000–\$10,000]

associated with improvements was not statistically significant. The increased length of stay may have been due to the increased focus on ICU performance in this on-going program. The use of telemedicine may have provided a means for hospitals to improve ICU care using fewer intensivists.

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