

PROFESSION

Tele-ICU technology improves patient outcomes, study finds

A medical center reports deaths and complications after remote monitoring was implemented.

By **KEVIN B. O'REILLY**, amednews staff. Posted May 30, 2011.

Technology that helps physicians remotely track more patients in intensive care units also improves care outcomes, according to a *Journal of the American Medical Association* study published in May that contradicts research finding no benefit.

So-called tele-ICUs allow intensivists, critical care nurses, respiratory therapists and other critical-care experts to see patients on video, receive electronic clinical data on their progress and communicate in real time with the health professionals in the unit to make changes in care.

About 10% of hospitals use tele-ICU technology to provide 24-hour coverage and help make up for a nationwide shortage of intensivists.

But previous research has found that tele-ICUs do little to benefit patients, said Marc Freiman, MD, who presented the results of a meta-analysis of studies covering 40,000 ICU patients at the American Thoracic Society International Conference in May.

"We found no statistically significant difference in hospital mortality between critically ill patients who received ICU telemonitoring and those who did not," said Dr. Freiman, an internist at Boston Medical Center.

However, the May 16 *JAMA* study -- not included in Dr. Freiman's analysis -- offered more encouraging results on the quality impact of tele-ICUs.

The study of nearly 7,000 ICU patients at the University of Massachusetts Memorial Medical Center in Worcester found improvements in mortality, lengths of stay, best-practice adherence and complication rates after tele-ICU was adopted.

"What we're comparing is a dead-asleep person at 2 a.m. taking a phone call from a nurse to a wide-awake person with an eight-screen monitor," said Craig M. Lilly, MD, lead author of the *JAMA* study.

"That person, on average, is going to give better care than the person at home who's asleep."

The mortality rate dropped from 13.6% to 11.8% after tele-ICU was implemented, and length of stay in the ICU fell from 13.3 days to 9.8. Also, adherence to best clinical practices for preventing deep vein thrombosis rose from 85% to 99%. Before tele-ICU, 1% of the intensive care patients had ventilator-associated pneumonia. The pneumonia rate dropped to 0.6% of patients after ICU telemonitoring was implemented.

"It's quite an important study," said Derek C. Angus, MD, MPH, a *JAMA* contributing editor and chair of the Dept. of Critical Care Medicine at the University of Pittsburgh School of Medicine. "The tele-ICU intervention was not just a camera, but a whole set of best-practice protocols organized live with auto prompts and alarms, with that re-engineering of care to make sure nothing's forgotten."

It cost about \$7.1 million to set up tele-ICU at UMass Memorial Medical Center and about \$3 million to operate, said Dr. Lilly, professor of medicine, anesthesiology and surgery at the University of Massachusetts Medical School. The costs were recouped within the first year due to higher patient volume enabled by shorter ICU stays, he said.

ADDITIONAL INFORMATION:

Intensive care, from a distance

Remote ICU management helped a Massachusetts medical center keep tabs on patients and follow evidence-based best practices. Here is how the center handled various care processes before and after tele-ICU.

Before tele-ICU	Using tele-ICU
Bedside monitor alarms	Alerts on physiological trends and abnormal laboratory values; review of response to alerts; off-site team rounds
Daily goal sheet	Electronic detection of nonadherence; real-time audits of nurses and teams
Telephone case review	Review at remote workstation includes EMR, imaging studies, interactive audio and video of patient and assessment of response to therapy

Source: "Hospital Mortality, Length of Stay, and Preventable Complications Among Critically Ill Patients Before and After Tele-ICU Reengineering of Critical Care Processes," *The Journal of the American Medical Association*, published online May 16 (www.jama.ama-assn.org/content/early/2011/05/12/jama.2011.697.abstract)

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"The Effect Of The Electronic ICU And Telemedicine On Hospital Mortality For Critically Ill Patients: A Meta-Analysis," scientific abstract presented at the American Thoracic Society International Conference, May 16 (www.thoracic.org/media/press-releases/conference/articles/2011/telemonitoring_may_not_offer_improved_outcomes_for_critically_ill_patients.pdf)

"Hospital Mortality, Length of Stay, and Preventable Complications Among Critically Ill Patients Before and After Tele-ICU Reengineering of Critical Care Processes," *The Journal of the American Medical Association*, published online May 16 (www.jama.ama-assn.org/content/early/2011/05/12/jama.2011.697)

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