

Use of telemedicine for ICU patients not linked with improvement in survival

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Remote monitoring of patients in intensive care units (ICUs) was not associated with an overall improvement in the risk of death or length of stay in the ICU or hospital, according to a study in the December 23/30 issue of *JAMA*.

Experts recommend that intensivists (intensive care physicians) care for ICU [patients](#) onsite because of an associated lower rate of illness and death. "However, there is a shortage of intensivists, which has led to the use of telemedicine technology to allow intensivists to remotely and simultaneously care for patients in several ICUs (ICU telemedicine [tele-ICU]), thus extending their reach," the authors write. "Remote monitoring may be a partial solution for the intensivist shortage, but it is expensive, its use is increasing, and there are few data in the peer-reviewed literature evaluating its effect on morbidity and mortality."

Eric J. Thomas, M.D., M.P.H., of the University of Texas Health Science Center at Houston, and colleagues assessed the effect of a tele-ICU intervention on mortality, complications, and length of stay (LOS) in 6 ICUs of 5 hospitals in a large U.S. [health care system](#) by measuring these outcomes before and after implementation of the tele-ICU. The study included 2,034 patients in the preintervention period (January 2003 to August 2005) and 2,108 patients in the postintervention period (July 2004 to July 2006). Almost two-thirds of the patients in the postintervention group had physicians who chose minimal delegation to the tele-ICU (n = 1,393 [66.1 percent]), in which the tele-ICU intervened only for patients in life-threatening situations. Physicians

delegated full treatment authority to the tele-ICU for 655 patients (31.1 percent).

The tele-ICU system included a remote office equipped with audiovisual monitoring and a computer workstation providing real-time vital signs with graphic trends; audiovisual connections to patients' rooms; early warning signals regarding abnormalities in a patient's status; and access to imaging studies and the medication administration record. Tele-ICU physicians conducted rounds based on subjective assessments of illness severity.

The researchers found that the observed hospital mortality rates were 12.0 percent in the preintervention period and 9.9 percent in the postintervention period. After adjustment for severity of illness, there were no significant differences associated with the telemedicine intervention for hospital mortality. ICU mortality rates were 9.2 percent in the preintervention period and 7.8 percent in the postintervention period, with the difference also not significant after adjustment.

The observed average hospital LOS among patients who survived to discharge was 9.8 days preintervention and 10.7 days postintervention; the observed average ICU LOS for the patients who survived to transfer was 4.3 days for the preintervention period vs. 4.6 days for the postintervention period, with neither difference significant.

"There was a significant interaction between the tele-ICU intervention and severity of illness, in which tele-ICU was associated with improved survival in sicker patients but with no improvement or worse outcomes in less sick patients," the researchers write.

"Implementation of a tele-ICU was not associated with a reduction in overall hospital mortality for patients in these 6 ICUs. The lack of apparent benefit may be attributable to low decisional authority granted

to the tele-ICU as well as to varied effects across different types of patients. Given the expense of tele-ICU technology, the conflicting evidence about its effectiveness, and the existence of other effective quality improvement interventions for ICUs, further use of this technology should proceed in the context of careful monitoring of patient outcomes and costs."

More information: *JAMA*. 2009;302[24]:2671-2678.

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