Telemedicine's Nominal ICU Impact Raises Questions

According to a recent study in the *JAMA*, remote monitoring of patients in intensive care units can not be associated with an overall improvement in the risk of death or length of stay in the ICU or hospital.

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, 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 six ICUs of five hospitals by measuring these outcomes before and after implementation of the tele-ICU.

The study included 2,034 patients in the pre-intervention period (January 2003 to August 2005) and 2,108 patients in the post-intervention period (July 2004 to July 2006). Almost two-thirds of the patients in the post-intervention group had physicians who chose minimal delegation to the tele-ICU in which the tele-ICU intervened only for patients in life-threatening situations.

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 pre-intervention period and 9.9 percent in the post-intervention 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 pre-intervention period and 7.8 percent in the post-intervention period, with the difference also not significant after adjustment.

The observed average hospital LOS among patients who survived to discharge was 9.8 days pre-intervention and 10.7 days post-intervention; the observed average

ICU length of stay for the patients who survived to transfer was 4.3 days for the pre-intervention period vs. 4.6 days for the post-intervention period.

Researchers felt these results show that the implementation of a tele-ICU was not associated with a reduction in overall hospital mortality for patients in these six 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. Furthermore, the research team felt that, “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.”

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