

## ICU telemedicine - why qualitative research matters



ICU telemedicine traces its beginnings to the 1970s, when an intensivist at a university hospital connected to a single small ICU using audio-visual technology to remotely conduct daily patient rounds and weekly teaching rounds with the local staff. This technology-based strategy is intended to improve patient care and outcomes, by extending the reach of nursing and physician specialists to greater numbers of critically ill patients.

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At present, ICU telemedicine covers more than 10 percent of ICUs in U.S. hospitals and seems to be growing still. Whilst it may be safe to assume that this telehealth innovation is here to stay, it is worth noting that the literature on the effectiveness of ICU telemedicine has not been convincing.

The story of ICU telemedicine has evolved over the past 40 years much like those of other organisational innovations – a series of variable quality studies of heterogeneous interventions with mixed results, say Jessica T. Lee, MD, MHS (University of Pennsylvania Perelman School of Medicine) and Meeta Prasad-Kerlin, MD, MSCE (University of Pennsylvania, Pulmonary, Allergy, and Critical Care Division), writing in a commentary published in the *American Journal of Respiratory and Critical Care Medicine*.

For Drs. Lee and Prasad-Kerlin, ICU telemedicine is another example of the challenge – perhaps impossibility – of traditional quantitative methods to completely elucidate the effectiveness of an organisational intervention. It is for this reason that the evidence for the effectiveness of ICU telemedicine has been limited and mixed.

"Organisational interventions are not as straightforward as therapeutic interventions – they are complex, multi-component programmes that affect multiple stakeholder groups and are in turn influenced by contextual factors. This is especially so in the complicated, high stakes, interprofessional environment of the ICU. Because new organisational models must be tailored to local needs, they are messy and challenging to assess quantitatively and with generalisability," Drs. Lee and Prasad-Kerlin explain.

The authors commend Kahn and colleagues for using qualitative research methods to develop a conceptual model for ICU telemedicine effectiveness. Using a rigorous qualitative approach, Kahn et al. were able to identify organisational characteristics common to ICU telemedicine programmes with improved mortality such as having shared staff (nurses and physicians worked in both the telemedicine facility and ICU) and orientation of new hires. They also described how components of the telemedicine programme might interact with contextual factors in the target ICU environment, providing an explanation for why a programme may be effective in a dyad with one ICU but not another.

The limitations of Kahn et al.'s study arise primarily from its generalisability. For example, all the studied programmes used a centralised telemedicine model. Although less common, decentralised ICU telemedicine programmes may have different determinants of effectiveness. And while one of the great potential benefits of ICU telemedicine is increased access to critical care specialists, all study ICUs except one had at least some availability of bedside intensivists. "The needs of ICU without any intensivists are likely to be very different and may not have been captured," Drs. Lee and Prasad-Kerlin point out. Although unanswered questions about ICU telemedicine remain, this qualitative study "provides us with a practical guide for local implementation, as well as for future qualitative and quantitative research.

Furthermore, it a useful reminder of the value of qualitative research for organisational innovations," the commentators conclude.

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