Commentary

Clinical information systems in the intensive care unit: *primum non nocere*

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Published: 9 January 2009
This article is online at http://ccforum.com/content/13/1/107

Critical Care 2009, **13:**107 (doi:10.1186/cc7143)

Abstract

Information and communication technology has the potential to address many problems encountered in intensive care unit (ICU) care, namely managing large amounts of patient and research data and reducing medical errors. The paper by Morrison and colleagues in the previous issue of *Critical Care* describes the adverse impact of introducing an electronic patient record in the ICU on multidisciplinary communication during ward rounds. The importance of evaluation and technology assessment in the implementation and use of new computing technology is highlighted.

In critical care, as in other areas of health care, clinicians are faced with rising health care costs and aging and increasingly complex patients. Furthermore, the rate of research knowledge production is outstripping our ability to incorporate this information into patient care. These factors, as well as the increasing awareness of the risks of medical error, have highlighted the potential benefits of information technology to clinical care. The paper by Morrison and colleagues [1] in the previous issue of *Critical Care* describes the impact of the introduction of an electronic patient record on interdisciplinary communication during intensive care unit (ICU) ward rounds. Critical care is a data-rich environment where it appears obvious that computing technology would be of benefit in managing the large amount of data generated by each patient [2], but few studies have formally evaluated the effects of introducing an information system into the ICU [3]. Some studies have addressed the benefits of clinical information systems with automated data capture from ICU devices, demonstrating a reduction in nursing workload [4,5], but this finding is certainly not uniform [6]. Furthermore, the reduction in common errors of omission and commission may be replaced by new errors facilitated by the technology itself [7].

It is with this fairly limited background that the paper by Morrison and colleagues [1] provides an important insight into another potential problem introduced by computing technology in the ICU. These investigators evaluated the effect of the introduction of an electronic patient record on team interactions and communication during ICU rounds. In a before-and-after study of the implementation of a fully integrated electronic patient record into their 25-bed ICU, they observed and video-recorded team interactions during daily rounds. In the physical setup after implementation, data were presented on a computer screen (rather than on a large observation chart plus additional charts and folders) and as a result were accessible to only a few team members. The attention of the group was no longer focused on the patient data and it was noted that team members had difficulty entering the conversation, impairing communication. One year after implementation, the process had improved; the physician leading rounds stood further back from the screen and the team members reoriented themselves. Staff reported preparing for the ward round by reviewing data that they would not have access to during the round. Questions were invited at the end of each patient in order to facilitate discussion.

Multidisciplinary communication and teamwork are essential to ICU care [8], and impaired communication in high-intensity clinical settings has been documented [9,10]. Information and communication technology may provide a solution to these communication lapses [11,12]. However, the paper by Morrison and colleagues [1] demonstrates that information technology may, in fact, introduce new barriers to communication. While these were overcome to some extent over a period of time by changing the format of the ward round, this is an issue that needs to be recognized, anticipated, and

ICU = intensive care unit.

resolved. One problem may have been the lack of attention to hardware. A single small screen may not be adequate to view the large amount of patient data generated daily, even with optimal software solutions. Morrison and colleagues discuss the fact that the cost of larger screens was prohibitive and handheld devices discourage communication, while ironically a paper printout for each team member was beneficial.

Morrison and colleagues are to be congratulated for their foresight in evaluating an important component of their new information and communication technology. While information systems and electronic patient records may be a solution for many of the current problems in health care, this clinical intervention requires an evidence-based assessment similar to that to which other clinical innovations are subject. It is essential to identify and prevent the potential hazards and negative effects of information technology [13]. The use of fully integrated ICU clinical information systems is not yet widespread in many areas [14], providing the opportunity for preplanned, comprehensive, and continual evaluation during the full life cycle of implementation and use of such systems [13,15].

Competing interests

The author declares that he has no competing interests.

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