Advocating for Greater Usability in Clinical Technologies

The Role of the Practicing Nurse

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KEYWORDS

• Usability • Nursing informatics • Electronic health records • Clinical nursing
• Empower

KEY POINTS

- Intensive care nurses use multiple technologies to perform an array of patient care tasks. For technologies to be useful, they must have utility and be highly usable.
- Electronic health records mediate many of nurses' tasks, and usability problems with these records can have unintended consequences that harm patients and cause additional workload for nurses and other clinicians.
- By advocating for strong usability testing methods by vendors and identifying usability problems, nurses can play a critical role in decreasing the technology associated workload and improving the technology's usefulness.

INTRODUCTION AND BACKGROUND

Technology in health care is now ubiquitous. Intensive Care Units, in particular, are a virtual sea of technology, often adding complexity to the environment where critically ill patients receive life-saving care. Nurses are often at the center of this complexity, using technologies[1] in their role of provider of hands-on care on behalf of the health care team. In addition to hands-on care, ICU nurses rely on clinical technologies to support one of their most important responsibilities: vigilance. That is, as the clinicians who spend the most time observing and assessing patients,[2] nurses play the primary role in detecting and responding to moment to moment clinical changes in critically ill patients to detect and respond rapidly to signs of patient deterioration.[3]

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There are multiple technologies to support the delivery of patient care in ICUs, including lifesaving technologies, technologies that monitor patients' ever-changing clinical conditions, technologies to retrieve patient medications, and technologies to directly deliver medications directly into the body.[4] In addition, health records are also now technologies (electronic health records [EHRs]) that are designed to both retrieve patient information, communicate a patient's condition to the entire team, provide a safe mechanism to order and administer medications, and document interventions.[5]

EHRs likely represent a major source of increased complexity both in and outside ICUs[6] for a majority of practicing nurses. In an effort to make care safer, a federal law was enacted in 2009 that gave strong incentives to EHR adoption.[7] By 2015, 83.8% of nonfederal acute care hospitals in the United States had adopted an EHR.[8] EHRs are used by both large and small hospitals and, in 2016, hospitals with fewer than 200 beds accounted for 78% of EHR purchases.[9] Even hospitals with existing comprehensive EHRs were impacted by the federal law, because a large number of hospitals changed to federally compliant new systems. Other reasons prompting EHR change over the past several years include the formation of new strategic partnerships, instability in the smaller EHR vendor market, and changing organizational needs.[9] This means that a majority of nurses employed at hospitals not only currently work with an EHR but also they likely lived through a major EHR implementation.

The process of using EHRs and other technologies to make care safer has also added additional workload.[10,11] What in the past may have been opening a paper chart and writing a structured note using free-text now involves a multistep computer log-in, identifying the relevant patients EHR from a list, scanning a list of electronic tabs to find the right section, and a series of mouse scrolling and searching for appropriate checkboxes and data entry fields. In addition, many EHRs provide a newer type of technology: clinical decision support (CDS). CDS provides real-time computer-generated information about a patient within the EHR that assists nurses[12] (and other clinicians)[13] in making decisions[14] and adhering to evidence-based guidelines. Although CDS supports decision-making and evidence-based practice, it often adds additional steps and may even temporarily stop workflow. Given the wide range of technologies that ICU nurses must use, it is not surprising that technologies with different functions are often designed by different vendors. This generally means that the interface, use steps, audible alarms, and so forth differ from technology to technology, further adding to the complexity of technology use in ICUs.

These technologies are integral to providing health care in the digital age and have led to many positive outcomes related to patient safety.[15–18] Unfortunately technology does not prevent all patient harm and can even facilitate nursing errors.[19,20] There is evidence of serious unintended consequences from health information technologies.[21–24] These problems are serious and include alert fatigue,[25–27] administration of multiple does of the same medication[28] or the wrong medication,[15] difficulty determining which medications are due,[28] and omission of scheduled medication administration.[28]

Given the complexity, major system changes, additional workload, and unintended consequences, health care providers are increasingly frustrated with technologies they find difficult to use.[18,29] Excessive clicks needed to access information, confusing alerts, too many alerts, false-positive alarms, and so forth are often routine parts of a clinician's day. What may seem like a simple problem or a small extra step is now compounded by the number of tasks now mediated by computer and other technologies. With medical errors estimated to be the third leading cause of death[30] and burnout a problem in retaining well-trained staff,[31–33] it is imperative that nurses and other