

Informatics Solutions for Application of Decision-Making Skills

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KEYWORDS

- Nursing informatics • Electronic health record • Clinical data • Clinical databases
- Clinical decision support systems • Nursing practice • Critical care nursing

KEY POINTS

- Decision-making in critical care nursing practice is highly demanding and is essential to quality patient outcomes.
- Nursing practice in critical care environments involves caring for patients with complex disease processes and requires in-depth, evidence-based understanding of pathophysiology and treatments to provide effective patient care.
- Informatics tools provide important support for nurse decision-making through integration of patient information with evidence.

INTRODUCTION

Poor decision-making has been linked with up to 98,000 deaths in hospitals each year.¹ Research indicates that critical care nurses make 238 decisions per hour.² Nursing informatics solutions represent one important effort to improve patient outcomes and support nursing practice. Nursing informatics is a field of science that combines the sciences of nursing, information, computers, and cognition to provide better access to patient information and support nursing practice.³ The goal of nursing informatics is to facilitate progression of patient data to information and

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wisdom to improve the patient condition.³ Nursing informatics currently includes many tools aimed at facilitation of these efforts. The purpose of this article was to discuss the utilization of electronic health record (EHR), clinical data, and Clinical Decision Support System (CDSS) tools to support decision-making in critical care nursing practice.

BACKGROUND

Critical care nurses coordinate care for patients with highly complex and potentially unstable illnesses.⁴ This requires critical care nurses to work within health care teams to maintain awareness of a patient's current status to limit and respond to complications with an end goal of improved patient outcomes.⁴ This high level of nursing care requires specialized education, knowledge, and skills for effective response to changes in patient status.⁴ Despite experience and training of nurses caring for complex patients, memory and rapid data processing can interfere with timely and correct decision-making. The EHR can assist in decision-making. In part due to Meaningful Use promoted by Health Information Technology for Economic and Clinical Health (HITECH) Acts as part of the American Recovery and Reinvestment Act of 2009, CDSS is required to facilitate effective use of the EHR in health care to improve patient outcomes.⁵

INFORMATICS TOOLS IN CRITICAL CARE

Electronic Health Record

The EHR serves as the core technology within the health care setting. The EHR functions to collect, store, and make available important patient information to support decision-making and care planning. Nurses manage thousands of data points each shift, reflective of the complex nature of critically ill patients.⁵ This is successful in part due to 2 characteristics of the EHR. First, embedded within the EHR are other technologies, such as CDSS, algorithms as alerts and early warning systems, and interfaces connecting, for example, infusion pump, hospital bed, and hemodynamic monitor data. Data from these devices have the potential of triggering an early warning alert (a problem is likely) or CDSS an actual problem (critical value). Second, the EHR supports data entry of patient information, which is a critical element for other embedded applications, such as acuity scale, pressure ulcer risk scale, and pain scale.⁶

Despite these characteristics of the EHR, effectiveness of the EHR as a technology to guide clinical decision-making is inconclusive. The current EHR is effective as a data entry system, it falls short with data retrieval threatening decision-making.⁶ Despite this, the federal mandate, Meaningful Use, sought to increase effective use of the EHR for improved patient outcomes.⁷ This mandate sought to attach reimbursement to effective use of the EHR that includes use of embedded technologies to enhance decision-making.⁸ Meaningful Use guidelines seek to enhance accessibility of information in the EHR for better patient outcomes.⁷ Unfortunately, nursing research finds that although the EHR is effective as a data entry tool, data retrieval is limited.⁶

Clinical Databases

Clinical databases are a collection of clinical data that exist "behind" the front-facing screens of the EHR and allow for data to be captured from basic and advanced hemodynamic monitoring devices and then integrated with the EHR. Monitoring devices used in the intensive care unit (ICU), such as arterial pressure or pulmonary artery

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