Chapter XIX
Knowledge Translation in Nursing Through Decision Support at the Point of Care

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ABSTRACT

With advances in electronic health record systems and mobile computing technologies it is possible to re-conceptualize how health professionals access information and design appropriate decision-support systems to support quality patient care. This chapter uses the context of nursing-sensitive patient outcomes data collection to explore how technology can be used to increase nurses' and other health professionals' access to patient outcomes information in real time to continually improve patient care. The chapter draws upon literature related to: (1) case-based reasoning, (2) feedback, (3) and evidence-based nursing practice to provide the theoretical foundation for an electronic knowledge translation intervention that was developed and tested for usability. Directions for future research include the need to understand how nurses experience uncertainty in their practice, how this influences information seeking behavior, and how information resources can be designed to support real-time clinical decision making.

INTRODUCTION

With the current explosion of accessible information and the continuing expansion of professional knowledge it is a challenge for nurses to regularly access information that is current and reliable. For example, being task-driven and coping with heavy workloads limits nurses' attention to and recognition of potential information needs and knowledge gaps (MacIntosh-Murray & Choo, 2005). McK-

night observed critical care nurses' information seeking was limited to obtaining patient-specific information from patients and families, the chart, and other existing clinical information systems (McKnight, 2006). She also reported nurses' feelings that seeking and analyzing information from the Internet or other traditional information resources could be ethically wrong—taking time and focus away from patient care. Re-conceptualizing how nurses' access information and designing appropriate **decision-support systems** to facilitate timely access to information could be important to increase **research utilization** in such demanding work environments. For instance, Estabrooks and colleagues suggest that Internet use by nurses could be increased if the information available on the Internet was more dynamic and more contextually relevant, and if computer access was more conveniently available to them (Estabrooks, O'Leary, Ricker, & Humphrey, 2003). A clinical decision-support system that provides nurses (or other clinicians) with practice information automatically in response to patient-specific assessment information is suggested as a solution for increasing the utilization of research evidence in practice.

In this chapter, we review point-of-care clinical decision-support systems in nursing. We describe the development of a computerized handheld 'information gathering and dissemination system' (e-Volution in Outcomes-Focused Knowledge Translation™) that enables nurses to simultaneously: assess and record patient outcomes information through a wireless network using **personal digital assistants** (PDAs) and present information in summary format for case-based reasoning; experience real-time feedback of patient outcomes information; and reference practice information at the point of care, such as best-practice guidelines. We discuss its use in the Canadian context. We provide the theoretical background to this decision-support system, specifically focusing on literature related to: (1) case-based reasoning, (2) feedback, (3) and **evidence-based nursing**. We conclude the chapter with a presentation of the findings from our own program of research focusing on a usability evaluation of the decision-support system we have developed. General directions for further development of point-of-care decision support systems using **information technology** are discussed.

CLINICAL DECISION SUPPORT

Every activity involves **decision-making**. In medical science, physicians make decisions about the patient's clinical diagnosis and treatment. The typical methodological approach to obtain a diagnostic decision is the comparison of the patient's presenting signs and symptoms, 'data set,' with a similar 'reference' set of data, which represents the 'normal' condition. In nursing science, nurses seek to answer questions about the patient's current health status, how this health status is likely to change in the future, and what interventions will be appropriate to promote recovery, maintain health, or control symptoms.

Where nursing practice has been examined, wide variation in the care delivered has been observed (Cullum & Sheldon, 1996). Cullum and Sheldon noted variation in the nursing management of people with leg ulcers, infection control practices in high-risk areas, and the management of fever in children. Doran et al. found significant variation in the documentation of specific types of nursing interventions for the management of functional status, pain, nausea, dyspnea, fatigue, and pressure ulcers in acute hospitalized patients and long-term care residents (Doran, Harrison, Laschinger et al., 2006). Evidence-based nursing resources could address this kind of variation in nursing practice by providing nurses with reliable information about which nursing interventions are effective for particular patient concerns. There is good evidence to suggest that timely access to research evidence, especially if imbedded into the clinical processes of care, minimizes variation in