

Discourse

Nursing Informatics: Developing Knowledge for Nursing Practice

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This issue of *CJNR* on Information Technology and Nursing Care offers an excellent opportunity to examine this relatively new area of nursing practice and to review research in the field.

The term nursing informatics is often used to describe the integration of information technologies and communications into nursing practice. The American Nurses Association defines it as

A specialty that integrates nursing science, computer science, and information science to manage and communicate data, information, and knowledge in nursing practice. Nursing informatics facilitates the integration of data, information and knowledge to support patients, nurses, and other providers in their decision-making in all roles and settings. This support is accomplished through the use of information structures, information processes, and information technology. (American Nurses Association Workgroup, 2001, p. 4)

To what extent does this definition apply to actual nursing environments? Nursing is recognized as a profession in which the documentation of patients' characteristics and associated tasks take up a considerable amount of the practitioner's time. According to Bowles (1997), nurses in clinical settings spend up to 50% of their time documenting patient-related information. Snyder-Halpern, Corcoran-Perry, and Narayan (2001) describe nurses as knowledge workers and suggest that nurses base their practice on a large body of clinical information and on specialized knowledge, which enable them to engage in decision-making and to evaluate the decision-making process, its results, and their actions. The authors also identify four tasks performed by the nursing knowledge worker: collection of data, organization of information, interpretation of information, and development of knowledge. They state that these reflect the general tasks associated with human information processing. To fulfil their roles, nurses must be supported by clinical practice environments

designed with a clear understanding of knowledge workers' roles and the kinds of decisional support they require. It is my deep conviction that nursing information systems and information technologies have the potential to play a major role in supporting nurses. However, efforts must be made to ensure that nursing, as a discipline and as a profession, is satisfied with the proposed information and communication technologies.

Information systems that are acquired or developed within health-care establishments and used by nurses are essentially transactional and are seldom fully integrated. In addition, the interface among systems is often less than optimal. For instance, these systems handle transactions for which the data are often standardized (e.g., laboratory results, medications). They function more as clinical-administrative systems than as purely clinical ones (Ordre des infirmières et infirmiers du Québec, 2002) and serve nurses primarily in their role as data collectors. If this trend persists, nurses may have difficulty integrating information technology into their daily practice. Indeed, if nursing information systems continue to restrict nurses' tasks, there is a risk that nurses will resist using them, as they offer so little support to the more complex functions of knowledge utilization and knowledge development. Since nurses who devote a considerable amount of time to documenting their practice feel increasingly burdened with information management, it seems more appropriate to develop information systems that support nurses in their decision-making and other functions, where timely access to knowledge is crucial.

These propositions are consistent with the goals articulated in *E-Nursing Strategy for Canada*, a report published recently by the Canadian Nurses Association (CNA) (2006). One goal of this strategy is the full integration of information and communication technology (ICT) into nurses' practice, in order to optimize client outcomes and permit nurses to avail themselves of the knowledge they need to support their practice. Achievement of the goals proposed in this report requires greater involvement by nurses in the development and testing of the ICT systems on which they are expected to rely. These include systems to assist with clinical decision-making, electronic health charts, virtual communities for learning and practice, and tele-nursing. Too often it is the other way around — nurses are required to adapt to ICT, making their workload heavier rather than lighter. For instance, nurses could proactively engage in project development within Canada Health Infoway, whose mission is “to foster and accelerate the development and adoption of electronic health information systems with compatible standards and communications technologies on a pan-Canadian basis, with tangible benefits to Canadians” (<http://www.infoway-inforoute.ca/>

[en/Home/home.aspx](#)). Unfortunately, there is no critical mass of nurses involved in Infoway's ongoing projects.

It is becoming increasingly clear that nurses must adopt a common language pertaining to patients' health-related issues, nursing "diagnostics," nursing interventions, and health outcomes. I am referring to the Nursing Minimum Data Set (NMDS) and its Canadian equivalent, Health Information: Nursing Components (HI:NC). Work has been ongoing for several years, under the guidance of the CNA and the Canadian Institute for Health Information, to establish consensus on the use of the International Classification of Nursing Practice (ICNP). A broadening of the collaboration to include provinces, such as Quebec, would serve to benefit the profession. This presents various challenges, however: we must first agree on the key elements to include in the HI:NC and then ensure that information-system developers include them in their applications; in addition, the knowledge generated must be taught in colleges and universities so that nurses are equipped with the language and tools they need.

In spite of these challenges, considerable progress has been made in Canada in recent years towards making nursing informatics a reality. The Canadian Nursing Informatics Association (CNIA) and the Association québécoise des infirmières et infirmiers en systèmes et technologies de l'information (AQIISTI) are two complementary bodies that share the goals of creating networks of nurses interested in ICT, promoting the development of nursing expertise in ICT, and providing a forum for dialogue on issues in the field. The CNIA has conducted a national study (*Assessing the Informatics Education Needs of Canadian Nurses—Educational Component. Educating tomorrow's nurses: Where's nursing informatics?*), publishing its findings in 2003 (Canadian Nursing Informatics Association, 2003). More recently, it has launched the *Canadian Journal of Nursing Informatics*. The AQIISTI recently published a position paper on the need for nurses at every health-care site in Quebec to be knowledgeable about nursing informatics (*Avis concernant une ressource infirmière en systèmes et technologies de l'information (STI): Un enjeu pour les établissements de santé pour le Québec*), distributed to all health-care institutions in the province. The AQIISTI is currently preparing a position paper on the need for systematic training of nurses in nursing informatics.

I am well aware that this overview does not address all issues related to information technology in nursing. Additional issues worthy of discussion include remote training, rates of Internet use among nurses, and the future of tele-nursing.

I see several promising avenues for research, although prioritizing them is no small task:

- Which development methodologies are most efficient in ensuring that nursing information systems truly support nurses in their practice?
- How can ICT be used to support the knowledge-management work of nurses in order to promote the efficient integration of research results into nursing practice?
- How can ICT provide nurses with ready access to data, information, and knowledge when they need it and in the desired format?
- How best can nursing practice be documented in nursing information systems using nursing classifications?
- What factors serve to facilitate and to limit the use of ICT by nurses?
- What are the most efficient strategies for deploying ICT for nursing?

From an evaluation perspective, we need to address the following questions:

- What impact does the use of ICT have on nurses? On patients?
- What is the organizational impact of nurses' use of ICT?
- What are the most suitable person-system interfaces for nurses to use with the ICT they are offered?

I cannot conclude this commentary without affirming the urgency of the need to educate nurses in nursing informatics. At the very least, all nurses should receive basic training so they become judicious users of information technology. The CNIA study proposes several related avenues to pursue. We can also draw inspiration from the work of Staggers, Gassert, and Curran (2001) in developing training programs in nursing informatics. These authors identify four levels of competence within nursing informatics: beginning nurse, experienced nurse, informatics nurse specialist, and informatics innovator. I believe that, with the development of training programs up to the level of innovator, nursing informatics will eventually become widely recognized as a nursing specialty in Canada, as it has been among our American colleagues since 1992.

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