Why Nurses Need to Understand Nursing Informatics

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Nursing informatics is an exciting nursing specialty—it affects learning environments, meaningful use, interprofessional collaboration, patient care settings, strategic planning, patient satisfaction, and, ultimately, patient outcomes. Simply put, *nursing informatics* is the practice of using nursing science and technology to enhance the pathway that data take to become knowledge to improve patient care. Furthermore, nursing informatics "is the synthesis of nursing science, information science, computer science, and cognitive science for the purpose of managing and enhancing health care data, information, knowledge, and wisdom to improve patient care and the nursing profession."[1(p90)] According to Hebda and Czar, it is "broadly defined as the use of information and computer technology to support all aspects of nursing practice, including direct delivery of care, administration, education, and research. The definition of nursing informatics is evolving as advances occur in nursing practice and technology."[2(p6)]

Nursing informatics is important to all nursing specialty areas. It is important for nurses to understand the relevance of nursing informatics to their practice. In clinical practice, for example, nursing informatics can be used to track patient outcomes, find data trends, and assess workload and interventions. It also can help develop technologies, such as apps, to help health care workers virtually monitor and stay in touch with patients, improve workflows, and help patients deal with their diseases. The use of nursing informatics in nursing education supports virtual teaching and learning, assessment, analytics associated with educational outcomes, and the paradigm shift of bringing the library to the student virtually. Nurse executives use nursing informatics to help them with cost containment, improved workflows, decision support, budgeting tools, and trending costs and savings. Nursing informatics also can facilitate and support nursing research by evaluating patient outcomes, evidence-based practice, standardized terminologies, and virtual knowledge bases. As nurses learn nursing informatics, they must learn to use all information technologies effectively, recognize the benefits and limitations of this technology, and integrate them into how they implement these technologies. In this era of large amounts of data, nursing informatics competencies are key to safe, efficient, and quality practice, and good use of nursing informatics can result in enhanced patient care outcomes.

THE DATA, INFORMATION, KNOWLEDGE, AND WISDOM PATHWAY

The principles and practices of nursing informatics allow nurses to understand the process they use to convert raw data into the wisdom they need to care for patients. This process is called the data, information, knowledge, and wisdom pathway. The data, information, knowledge, and wisdom

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pathway is used in all levels of nursing practice. As nurses access data and process it into information and knowledge, they build the wisdom necessary to positively affect the lives of their patients. Nursing informatics provides the tools and capabilities necessary to enrich the data, information, knowledge, and wisdom pathway and, therefore, literally puts the information and knowledge nurses need at their fingertips.

The pathway begins with data. Data are raw facts that do not have meaning without context. After data have been processed to have meaning, they become information. For information to be valuable, it must be accessible, accurate, timely, complete, cost effective, flexible, reliable, relevant, simple, verifiable, and secure.

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The next step is for information to become knowledge, which is information that the user can relate to other information and can apply to a task or use to reach an informed decision. As nurses acquire important knowledge and skills and hone their ability to observe patients and their environments (ie, acquiring more data), they learn to place their observations in proper contexts to generate information. As their knowledge grows, nurses can assess the information they have acquired, communicate applicable findings, and take appropriate actions based on these assessments. Nursing informatics informs and supports these activities.

Wisdom, the final step on the pathway, is the application of knowledge to appropriate situations by using insight or intuition while being thoughtful, judicious, and practical. Nurses need to apply their knowledge to patients' situations and rely on their knowledge, integrated with evidence-based practice, to enhance patient care. Wisdom uses knowledge and experience to heighten common sense, perceptions, and the ability to think critically and use sound clinical judgment. Knowledge and wisdom are not synonymous, because knowledge includes others' thoughts and information, whereas wisdom is focused on one's own mind and the synthesis of one's own experience, insight, intuition, understanding, and knowledge. Wisdom could be thought of as the foundation of the art of nursing.

PERSONAL IMPORTANCE

The focus of this new "Everyday Informatics" column is to help nurses understand and implement the concepts of nursing informatics and optimize patient care by using health care technology. Examples of concepts and topics that will fit within this column include electronic health records (EHR) personal health records, electronic access to care (eg, telehealth), terminologies and taxonomies (eg, the Perioperative Nursing Data Set[3] language), virtual environments, social networking and professional boundaries, simulation, robotics, databases and database management, analytics, dashboards and benchmarking, accessibility, privacy, meaningful use, and optimization. Innovative ideas and questions of how perioperative nurses embrace the rapid advancement of technology and retain the art of the practice at the same time generates content for this column.

The team members who will be writing this column with me are Kathy Hunter, Toni Hebda, and Carolyn Sipes. I asked them each to say why they believe nursing informatics is important. Their responses are included here.

Monitoring Patients

Kathy Hunter: Years ago, when I was working full time nights in the Maryland Shock-Trauma Unit, we had computer display units in every patient cubicle that were connected to patient monitoring equipment. Laboratory data were provided directly from the trauma laboratory. Vital signs

data were collected from the monitors. Critical parameters could be automatically calculated or requested as needed. Any parameters one wanted could be graphed in combination on demand. There also were programs for collecting nursing data (ie, assessments). This system was pretty primitive compared with those available today, but even then I could see the value of having the collected data displayed across time—watching trends was a big part of nurses' ongoing monitoring. Entering the data was worth the effort because the information we received helped keeping up with patients' often rapid physical changes. It was this realization that first got me involved in what is now called informatics.

Informaticists provide shoulder-to-shoulder support for clinical staff members during the go-live phase of electronic health record implementation.

Implementing EHRs

Carolyn Sipes: During the past 11 years, I have worked as a consultant with several health systems, both nationally and internationally. Even today, I see the same issues arise with EHR implementation regardless of whether they are large or small implementations, or whether they are national or international implementations. The one consistent theme throughout all of these implementations is the lack of communication and understanding between what information technology department personnel think should be implemented for clinical staff members versus what the nurses and other clinical staff members really need to complete their day-to-day tasks. Health systems are becoming better at recognizing the need and value of the nurse informaticist who can facilitate the process and communication between the two specialties.

In the past, and even today, one of the key risks for project failure in an EHR implementation is when it is the sole responsibility of the information technology department to design a system for clinical users without their input into what is required for them to successfully complete their work. Today, the informaticist functions in the role of a facilitator for information technology and clinical staff members as well as performs many other roles. On some projects, informaticists might work as analysts, or work to interpret and assist with a workflow design and implementation, or collect and analyze data that might be used in a manager's monthly dashboard report. They provide shoulder-to-shoulder support for clinical staff members during the go-live phase of the implementation. The role for the informaticist is expanding even further as organizations recognize the value a nurse informaticist can bring.

An example that emphasizes the value of an EHR and role of the nurse informaticist was when both the Cleveland Clinic and a competitor were implementing the same EHR system. A patient had tests and radiographs performed at one facility, and a physician told me how he had cancelled tests and radiographs he had ordered for the patient because the tests had already been run at the competing hospital. Working with the nurse informaticist who facilitated the communication between the two hospitals, he said he trusted their results and would use those instead. The philosophy of using a national EHR system and adding the skills of a nurse informaticist who understands the functions of both has saved many health care dollars.

Supporting Nurses' Work

Toni Hebda: Nurse informatics supports the work that nurses do. It allows quick access to information when and where it is needed by the people who need it to facilitate the delivery of safe, effective patient care, support administrative decisions, and enhance the education of nursing students, health care consumers, and the public through the use of well-designed and well-used technology. Nurse informatics provides the tools to make nursing

contributions to health care delivery visible, support research, and allow virtual real-time decision making through the use of analytics, which is a method that allows the discovery and communication of meaningful patterns in large unorganized data sets. Nursing informatics is an exciting area of specialization that focuses on working smarter, not harder. AORN

Editor's note: *The second edition of the Perioperative Nursing Data Set (PNDS) was superseded by the third edition (PNDS 3) in 2011. The PNDS 3 terminology is only distributed through AORN and AORN Syntegrity® licensed vendors. For questions about PNDS 3 implementation into the EHR and electronic perioperative record solutions, please contact the AORN Syntegrity team via e-mail at* syntegrity@aorn.org. *AORN Syntegrity is a registered trademark of AORN, Inc, Denver, CO.*

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