Informatics and the Future of Nursing: Harnessing the Power of Standardized Nursing Terminology

by Patricia M. Schwirian

EDITOR’S SUMMARY
Rolled into general health services, an invisible part of a hospital room rate, nursing is overdue for its own professional identity. One hallmark of a true profession is universal use of a specialized vocabulary by members. Standardized nursing terminologies provide a consistent basis for communicating the unique contributions of nursing to direct patient care and to research. Nursing has the dubious advantage of having seven recognized term sets serving numerous purposes but undermining the goal of consistency, key to widespread recognition and acceptance. Adoption of a single vocabulary appears doubtful, though two stand out for active support, currency and free availability. Widespread use of a standardized nursing terminology will come with time, consistent use, incorporation into nursing education and reference in professional health care and nursing journals. Cross mappings to important medical terminologies are necessary for interoperability and use in health and nursing informatics research.

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Most people agree that nursing is a profession. Others, however, would argue that it is still evolving because it lacks some of the hallmarks of a “true” profession. For example, a “true” profession entails the right to practice independently. Nursing isn’t there yet. While states vary considerably in the extent to which a nurse’s practice must be supervised by a physician, supervision in some form is still the case. Another defining characteristic of a “true” profession is a specialized vocabulary that is used and understood universally by its members. Professions such as medicine and law have specialized vocabularies of long standing.

A significant challenge that nursing has always faced is how to differentiate nursing’s contributions to patient care from those of medicine – particularly in the hospital environment. With the increasing importance of the electronic health record (EHR) and the Nationwide Health Information Network of which the EHR is the foundation, the challenge becomes even more important. Rutherford [1] has stated it well: “Practicing nurses need to know why it is important to document care using standardized nursing languages, especially as more and more organizations are moving to electronic documentation (ED) and the use of electronic health records. In fact, it is impossible for medicine, nursing or any health care-related discipline to implement the use of ED without having a standardized language or vocabulary to describe the key components of the care process.” Another colleague and I recently wrote, “We need to identify nursing’s contribution to patient care and determine the best way to incorporate elements of nursing care into the EHR and other documentation that describes and evaluates the quality of patient care. Fortunately, the answer is already at hand; it lies in the use of standardized terminologies that reflect the uniqueness of nursing care. A key element in differentiation between the purposes and practices of nursing and medicine lies in the professional languages that are used and understood within and between these disciplines”[2].

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Using standardized nursing terminologies (SNTs) has several important – and necessary – benefits. They include better communication among nurses and other healthcare providers; increased visibility of nursing interventions and resultant patient outcomes; improved patient care; greater adherence to standards of care; and furthering the nursing research agenda by generating data about patient care in a consistent manner [2].

It was exactly this last element – furthering the nursing research agenda – that prompted Harriet H. Werley, a nursing leader of incredible intellect, dedication and foresight, to take the lead in what was to become nursing informatics in the very early 1980s. As she pointed out, “Nurses must learn to take advantage of the advances made in the information and computer age and recognize that the opportunities and technology are there for them to conduct research and develop their computerized nursing information systems. Only then can the nursing care documentation and related nursing administrative data be collected, retrieved and manipulated in systematic ways to advance nursing practice…as well as the profession.”[3, p. xix]

Standardization of the language that nurses use to document care and outcomes had to be an integral element of this effort.

A factor that Werley did not address, but one that has been a sore point for nurses for many years is “being part of the room rent.” When one goes to a hospital for diagnosis, treatment and care of a disease, disorder or injury, one expects to pay for the services received from physicians. Typically, however, nurses perform most of the direct care that a patient receives. One never expects to get a bill for those services. Yet, as Moss and Saba [4] have pointed out, “The cost of nursing care constitutes a high proportion of healthcare expenses. . . . The current practice of billing for inpatient healthcare services is based on the outdated and often impractical accounting system from the 1930s wherein hospitals bill patients at a fixed daily room rate and the costs of nursing services are included within this per-diem change. . . . Thus, nursing costs are included in overall department and organizational summaries and are not itemized, devaluing the critically important role of the nurse in the delivery of direct and indirect patient care” [4, p. TC149].

In addition to Harriet Werley, another major player in the evolution of standardized nursing terminologies was Norma M. Lang. She was a key figure in the conceptualization and development of nursing diagnosis – a concept that arose in the mid 1970s. Lang built on the work of Marjory Gordon who, in 1976, offered conceptual and structural definitions of nursing diagnosis. According to Gordon [5], a nursing diagnosis has three essential components: the health problem (P), the etiology (E) and the defining characteristics or signs and symptoms (S). The development of a nursing diagnosis taxonomy and its use in nursing practice, many argued, was a means of defining nursing practice both inside and outside the profession and of contributing to the growth of nursing autonomy. Led by Norma Lang, this line of work ultimately produced a set of diagnostic statements that were accepted by the North American Nursing Diagnosis Association (NANDA). NANDA diagnoses were developed using a Delphi-like system in which experts provided input to the development and refinement of each statement. There was – and still is – considerable criticism directed toward the NANDA taxonomy, but it still holds a significant place in the world of SNT’s.

A Standardized Nursing Terminology or the Standardized Nursing Terminologies?

The development of SNTs proceeded rapidly through the late 1980s and into the 1990s. Nursing is a very broad field. Most nurses practice in hospitals, but many engage in practice – home health, office nursing, community nursing, occupational nursing. Moreover, there are subspecialties under each of these areas, so it is difficult to find one terminology that will meet the needs of all these groups of nurses. Accordingly, different terminologies have been developed that reflect different kinds of practice and incorporate varying conceptual foundations. Many argue that progress would be made more rapidly if nurses would simply agree on one best or most-inclusive SNT, thereby allowing nurses to present a more unified front in their efforts to define nursing practice in a unified, understandable manner. That agreement has not come to pass.

Instead, nursing’s most powerful voice and standard-setter – the American Nurses’ Association (ANA) has defined a set of ANA-Recognized Terminologies. Carol Bickford, a senior policy fellow in ANA’s Department of Practice and Policy, has stated, “Nursing is both blessed and challenged
by the wealth of terminologies available for describing nursing practice and nurse’s contributions to healthcare. This diversity offers practitioners choices in how to best describe their patient population and practice.” [6, p. 182-183]. The Committee for Nursing Practice Information Infrastructure (CNPII) provides oversight for the recognition program. The recognized terminologies include seven interface (or point-of-care) terminologies and three multidisciplinary terminologies.

1. **Clinical Care Classification (CCC).** The CCC is a research-based, empirically developed terminology that started with a community focus, but has evolved under the direction of Virginia Saba at Georgetown University into a comprehensive terminology designed to be applicable to all settings. It includes nursing diagnoses, interventions and outcomes. The CCC was designed to be computerized. Some of the others are not.

2. **Omaha System.** The Omaha System was also designed from the beginning to provide a structure that was computer compatible. Like the CCC it is also research-based, and under the leadership of Karen Martin at the Omaha Visiting Nurses Association “…was developed, tested and revised through the efforts of public health and home care nurses in Omaha, Nebraska and community health agencies in seven other geographical areas.” [7, p. 297]. The Omaha System includes an assessment component, an intervention component and an outcomes component. While originating in community and home care, it has evolved over time and is currently applicable in a wide variety of nursing care settings, including acute care.

3. **Nursing Intervention Classification (NIC).** The NIC is a “…comprehensive, research-based standardized classification of interventions that nurses perform. It is useful for clinical documentation, communication of care across settings, integration of data across systems and settings, effectiveness research, productivity measurement, competency evaluation, reimbursement and curricular design. The classification includes the interventions that nurses do on behalf of patients, both independent and collaborative interventions, both direct and indirect care.” [8]. Developed by nurse researchers at the University of Iowa, the NIC interventions include both the physiological and the psychosocial. The 554 interventions are grouped into 30 classes and seven domains – physiological: basic; physiological: complex; behavioral; safety; family; health system; and community. Each intervention has a unique number (code). The NIC is continually updated and is mapped into SNOMED (Systemized Nomenclature of Medicine).

4. **Nursing Outcomes Classification (NOC).** NOC was also developed at the University of Iowa. A nursing outcome is defined as “…a measurable individual, family, or community state, behavior or perception that is measured along a continuum and is responsive to nursing interventions. The outcomes are developed for use in all settings and all patient populations. Clinical sites used to test the NOC included tertiary care hospitals, community hospitals, community agencies, nursing centers and a nursing home. . . . The 490 outcomes are grouped into 32 classes and seven domains: functional health, physiologic health, psychosocial health, health knowledge and behavior, perceived health, family health and community health. Each outcome has a unique code number that facilitates its use in computerized clinical information systems [9]. Like its sister program, NIC, it has been mapped into SNOMED.

5. **NANDA International (Nursing Diagnoses, Definitions and Classification).** The historical importance of NANDA as a foundational element of the SNTs has already been mentioned – as has the centrality of its developer and champion, Norma Lang. It is a nursing diagnosis classification developed to describe judgments made by nurses in providing care. These diagnoses are the basis for selecting appropriate nursing interventions and establishing desirable patient outcomes. The terminology is updated every two years.

6. **International Classification for Nursing Practice (ICNP).** This classification is the newest of the SNT development efforts and the only one of the ANA-recognized terminologies that is international in scope. ICNP is the outcome of a proposal to the International Council of National Nurses to develop a standardized vocabulary and classification of nursing phenomena, interventions and outcomes that would be useful in both paper and electronic records. Moreover, it was to be part of a worldwide infrastructure for the purpose of improving healthcare policy and patient care globally. It was to involve a common language to
facilitate communications describing nursing care and stimulate nursing research. Current efforts focus on mapping the ICNP to the ADA-recognized terminologies and SNOMED CT [7].

7. Perioperative Nursing Data Set (PNDS). Members of the American Operating Room Nurses association started the PNDS development in 1993. It describes perioperative nursing diagnoses, interventions and patient outcomes that are specific to the perioperative environment from preadmission until discharge using standardized elements.

Is the Adoption of a Single SNT Likely to Occur?

The simplest answer is “probably not.” It is my opinion that the two single SNTs that are the most likely to have the most widespread use are the CCC and the Omaha system for three primary reasons. First, each has a vigorous champion. Virginia Saba is an outspoken advocate for the CCC, which she developed. She is a very active contributor to the online discussions of the American Nursing Informatics Association (ANIA). ANIA is an organization composed primarily of the nurses who are active in the field of informatics—primarily in hospitals. When questions arise pertaining to technical/structural problems an informatics nurse may have, Dr. Saba is quick to explain how the CCC handles that problem. She is also active in research that evaluates the utility of the CCC in nursing practice. For example, in a 2012 issue of CIN: Computers, Informatics, Nursing (considered by most to be the premier journal in the NI field), she and Jacqueline Moss, a colleague from the University of Alabama at Birmingham, reported on a pilot study that demonstrated the use of the CCC System Costing Method to tease out the actual costs of nursing care [4]. Could this be a ticket to “getting out of the room rent”?

The Omaha System also has an equally dedicated champion in Karen Martin, who directed the development of the Omaha System when she was employed by the Visiting Nurses Association of Omaha, Nebraska. Like Dr. Saba, she too is actively involved in research that demonstrates the value of her system. In 2011 CIN published a paper in which she and colleagues from the University of Minnesota and the University of Pennsylvania discussed how implementation of the Omaha System can contribute to achieving the goals of meaningful use—a critical element in the American Recovery and

Reinvestment Act of 2009. Achieving meaningful use goals has significant financial implications for eligible professionals and hospitals that use certified electronic health record technology [9]. Dr. Martin is also a tireless presenter of Omaha System workshops and programs for users at all levels of expertise.

Beyond the dedicated efforts of Saba and Martin, the CCC and Omaha systems have another advantage: they are both in the public domain and they are free! Finally, both systems are religiously kept up to date—a “must” if a system is to survive in the highly competitive healthcare marketplace.

Are We “Harnessing the Power”?

In my opinion, the best answer is “We are getting there.” Progress is being made, but in a fragmented way. For example, the NANDA typology has been a regular part of baccalaureate nursing programs for at least the past 10 years, so students are familiar with the notion of a standardized terminology and structured language. The younger generation of nurses therefore has that experience as a piece of their education. However, most older nurses have no familiarity with NANDA or any of the more recent structured languages [2][11]. How are practicing nurses going to become familiar with SNTs? Linda Thede and I raised that question in our second national survey of nurses. While the workshops and orientations provided by vendors of EHRs as part of the installation package are often their only source, many are learning about SNTs from the professional literature and continuing education. However, the lack of follow-up education available in their everyday practice makes it difficult for most nurses to make SNTs a part of their everyday practice [12]. Provision of ongoing, follow-up education and support is a must.

Another indicator of progress is the increasing frequency with which articles about the value of SNTs and research reports describing their effectiveness in achieving patient care goals are appearing in the respected professional healthcare journals focused on informatics such as CIN: Computers, Informatics, Nursing and JAMIA (Journal of the American Association of Medical Informatics). The nursing specialty journals are also picking up on SNT articles applicable to their own areas of practice.

In order for the informatics goal of full interoperability across nursing information systems to be achieved, two steps must take place. The first is
that nurses must be supported consistently in their use of SNTs; the second is that cross-mappings among the various terminologies must be completed. Although all the major nursing terminologies have been included in the Unified Medical Language System (UMLS) developed and distributed by the National Library of Medicine (NLM), research is needed to map these terminologies fully and accurately. Fortunately, work in this area is underway, suggesting that the importance of capturing and manipulating data regarding nursing effectiveness is now much more widely recognized [13] [14].

Finally, in my role as an educator (I teach an online graduate nursing informatics course and almost all of my students are also employed full time in hospitals) I’m seeing progress. One of the discussion questions I present has to do with the extent to which they have encountered SNTs in their professional practice and what they think about the impact of SNTs on nursing practice and patient care. Three or four years ago their responses were mostly a blank slate. That situation has changed dramatically for the better in the past year as vendors are incorporating SNTs in varied forms and combinations into the nursing-care related elements of the EHR. Sometimes they tell me that until they read about SNTs in my class they didn’t know that they were working with them, but now they do. That might be a backdoor approach to learning and appreciating SNTs, but I am encouraged.

Now, about getting out of that room rent!