

are physically placed on a disk. At the other end of the spectrum, medical informaticians need equally direct exposure to the problems in their areas of health expertise. A physician who sees 25 patients in a half-day clinic sees a different set of requirements than a similarly trained individual who sees only five patients in the same time.

In evolution, the past is a part of the future. In revolution, progress is built around the learnings of the past and generally comes from novel associations or superimpositions of concepts. By combining an understanding of what actually limits use of current technology with the experience of trying to apply the technology to a health-related problem, a medical

informatician is positioned always to have a productive evolutionary idea and, on occasion, to have a truly revolutionary idea.

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On the Relevance of Discipline to Informatics

Even when a word in a sentence has a standard definition, individuals from varied backgrounds may interpret the sentence differently. Take the following sentence for example: The decision to initiate a code remains a clinical choice. To a physician or nurse, the sentence defines the legal and clinical responsibilities of health care providers in deciding whether to resuscitate a patient after a cardiac arrest; to the computer scientist, the sentence contains an obscure reference to data representation. The meaning of the sentence to an individual derives from the combination of its literal content and that individual's own background. Discipline represents an important influence in shaping the language of clinical practitioners. With the emergence of controlled vocabularies, the impact of discipline on language commands attention in contemporary informatics.

Several attempts have been made to examine the representation of discipline in the language of health care. Henry's work¹ seeks to map the language of one discipline (nursing) onto a vocabulary developed for a different discipline (medicine). Ozbolt² takes the view that discipline is central to vocabulary development in that it provides guidance as to what language must, and must not, be included. To what degree does discipline need to be reflected in standardized vocabularies or information structures? To

the degree necessary to preserve substantive meaning intended by the initiating discipline.

Discipline, a body of knowledge,³ provides perspective, illuminating the values and beliefs that are fundamental to the service provided by the practitioners of the discipline. Discipline denotes the foundation from which practitioners approach patients and apply therapeutics. A discipline produces knowledge that is unique to it. The knowledge, in turn, is evident in the language of the discipline. Discipline is that which distinguishes nursing from medicine, or medicine from dentistry.

Discipline draws the attention of its practitioners toward certain phenomena and away from others, and provides its membership with the language necessary for expression. Discipline provides context to the words employed in describing the provision of care. Patient care results from the interplay of various professional groups. Each group holds a unique perspective of the patient and contributes essential services on the patient's behalf. The language employed by the physician to describe a patient includes words (descriptors) that express disease state, prognosis, and expected etiology. Words employed by a nurse include the human response to the disease state,⁴ resources, and coping abilities. While some of the language em-

ployed by the two practitioners appears similar (for example, personal attributes such as age and gender, and physiologic indicators such as blood pressure and hematocrit), the relationship of these shared terms to the unique concepts of each discipline further distinguishes the languages.

Discipline both informs and results from practice. The languages of practice disciplines then assumes a very central role in characterizing the multidisciplinary nature of health care. Lack of attention to discipline limits the ability to interpret the language of practice. Errors of language arising from omission or confusion become common when attention is focused on specific words and phrases and not upon the language of the discipline within the context of practice.

What is unique about each discipline that must be represented in the vocabularies or information structures? In the case of my discipline, nursing, the language must be sufficiently complete to incorporate the work of nursing, that is, the recognition and treatment of human responses. Where other disciplines focus on the cellular and anatomic disruptions directly, the perspective unique to nursing is to aid or compensate for the impact of these disruptions on human function. The problems toward which nurses apply their efforts, and the human responses descriptive of the phenomena of concern, form the necessary elements that must be represented in any vocabulary germane to nursing.

Informatics must develop techniques that represent the knowledge and practice of each of the health

disciplines. This challenge requires careful attention to vocabularies that are shared by all disciplines, and those that are unique to individual disciplines. Terms that appear similar cannot be presumed to be synonymous. The fact that health care practitioners draw upon many disciplines for the language of practice does not imply that a single representation of clinical information is appropriate. Nor will patients be well served by exclusive use of discipline-specific language. Vocabularies need to be constructed in a manner that preserves the context of each discipline and ensures translation between the disciplines.

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