

# Editorial Comments

# JAMIA

## Medical Informatics: The Key to an Organization's Place in the New Health Care Environment

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The time has come for health care organizations of all types to invest in people skilled in medical informatics. Such an investment will be essential to meeting their business goals in the new environment.

The changes in the health care system during the next decade are going to make the last twenty years seem like good old days of relative stability. The past twenty years have seen tremendous changes—new drugs, new devices, and new techniques. These changes will certainly continue, but the true megachanges of the next decade will center around gathering, managing, and using clinical information. This prediction will prove true for all the health care areas—administrative, clinical, teaching, and research. Yet we make it at a time when most health care information is still being managed manually and in ways that can be charitably described as “refinements” of the 1975 information management paradigm. True reengineering of the health care information management infrastructure has hardly begun. The press for improved access to health care, the expectation of having health care provided at lower cost, the development of vertically and horizontally integrated delivery systems, the emphasis on wellness, and the transition to medicine based on an understanding of the human genome are creating dramatic changes in roles and responsibilities in the health care system. Although information system consultants and vendors are flocking to offer solutions, these solutions still tend to follow old paradigms. Millions of dollars are being wasted on information systems that work barely adequately for the present and that offer little or nothing for the future. The development of a new, robust information management paradigm is the critical challenge facing the health care industry.

Four cornerstones of medical informatics form the basis for developing a new information management paradigm for health care. These four cornerstone areas of knowledge and expertise extend well beyond the skills associated with traditional data processing and information systems and include:

1. producing structures to represent data and knowledge;
2. developing methods for acquisition and presentation of data;
3. managing change to optimize the use of information by people and by organizations; and
4. integrating information from such diverse sources as home health, employers, hospitals, and libraries.

These four medical informatics cornerstones can support today's and tomorrow's health enterprises in practical ways, as outlined below:

Structured representation of data and knowledge permits creation and organization of effective vocabularies to serve as a foundation for uniform medical practice and as a tool for aggregating data for analysis of outcomes; linkage of work support systems with decision support modules and library-based resources; and integration of information from clinical, academic, financial, and other computer systems into a total package that provides a context for management of confidentiality and security. Systems based on the structures being developed by medical informatics are required to improve the quality of clinical and business decision making, to cope with the knowledge explosion, and to control the adverse effects of increased information access.

Optimal methods for data acquisition permit data capture and validation at the source. Data presentation techniques that are sensitive to clinical context and setting enhance efficiency and decision making. Progress with the applied medical informatics research that is under way in these areas, together with the knowledge that medical informatics brings about what data are actually needed, is key in the creation of the electronic patient record. Such a record is required to support a patient-centered information management system that can span a vertically integrated health care delivery system.

Changes in the work process permit leverage of information technology, whereas insertion of information technology into an old process often decreases effectiveness. Medical informatics professionals are trained to understand both the objective of the work process and the capability of information technology. This dual background, together with their experience as change agents, positions them to design optimal processes and to set a course by which an organization can move from old processes to new ones. A medical informatics unit can help convert the changes that all health care organizations are experiencing today from stressful problems into opportunities for introduction of new work processes that take advantage of information technology.

Medical informatics is concerned with managing information content, in contrast to an information system. The emphasis is on standards, and communicating between system components. Such a focus permits management of information as an enterprise-wide asset, independent of the systems that support the various facilities that

make up the enterprise. Medical informatics concepts are required for building solutions such as clinical repositories and systems that provide seamless integration between the business units of the enterprise. Such solutions are required if health-based organizations are to create integrated delivery systems through constantly changing partnerships, coalitions, or alliances while maintaining a cohesive information model to promote their strategic goals.

The strategic use of medical informatics professionals and the concepts they understand will be crucial to the repositioning of health care delivery systems. A delivery system's access to and by patients, evidence-based decision making and outcome-oriented practice, and dynamic business strategies are each dependent on informatics. Most organizations can and do use data processing and information systems. However, only through the systematic application of sound informatics concepts—from the intellectual development of how information assets are organized and managed, to what work processes should look like and how information systems should be implemented to support them—can health care organizations actually ready themselves for the twenty-first century.

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*Editor's note:* How do we market medical informatics? This question surfaced during the 1995 American College of Medical Informatics Symposium in Tucson, Arizona. Hospitals understand the need for a chief financial officer. Even small practices are likely to have a business manager. Yet few leaders of health care organizations appreciate the need to include a person who has skills in medical informatics on their staff. Even in settings where chief information officers have emerged, those individuals are more likely to have a background in data processing than in informatics. When questioned, chief executive officers in health care enterprises tend to respond that they shouldn't need an

informatics unit and that one would be beyond their means. This judgment reflects the idea that vendors should be able to provide solutions and that informatics is an ivory tower pursuit.

The attendees at the symposium agreed that the people working in the field of medical informatics were not doing a good job of communicating the importance of their work to decision makers. One suggestion was that the field should develop a series of sound bites to get the message out. This editorial was prepared in an attempt to meet that challenge.—W.W.S.