Editorial Comments JAMIA

Medical Informatics—On the Path Toward Universal Truths

Patel and Kaufman make a clearly reasoned case for characterizing medical informatics as a local science of design.[1] This analysis suggests that medical informatics may not be based on a set of discoverable universal truths. It goes on to point out that investigators can still discover general principles by limiting the scope of application. Lessons learned about what works, and what does not, can also be generalized, as can frameworks that organize what is known. People practicing medical informatics should strive to derive lessons that will generalize in this fashion.

I agree that the practice of medical informatics has been challenged by the difficulty in transferring systems from one site to another. Similarly, in the science of medical informatics, a subdiscipline sometimes seems to try to dominate the others, instead of coming together as part of an interdisciplinary community. Nonetheless, I am reluctant to accept the observation that medical informatics does not involve universal truths. If we give up on finding universal truth, we doom the field to incremental progress. Our hope for an effective health system depends on our making the kind of step function change that comes with widespread use of a new universal truth.

Let's start with the definition of medical informatics. Past definitions reflect how we do things, not what we hope to achieve. These task-oriented definitions have changed as the tools of the field have changed. Recently, I had a chance to discuss the potential for medical informatics to support family-centered health care with Vice President Gore. I needed to start with a definition of what we do. Webster's Unabridged Dictionary defined "nephrology" (my clinical specialty) as the science that deals with the kidney, its structure, function, and disease. I therefore remarked that medical informatics is the science that deals with health information, its structure, acquisition, and use. This definition seemed to make sense to a lay audience, and its generality may let it stand the test of time.

Medical informatics is coming of age as a discipline. In the past decade we have passed milestones that seem to have the impact of general truths. The first is the Unified Medical Language System (UMLS).[2] It has shown that it is important to document the relationships among terms instead of trying to develop a standard vocabulary. In fact, there is more information in the links between terms than in the terms themselves. The World Wide Web[3] is the second. It demonstrates the power of linkage across the network of information resources made for one purpose, into an application made to do something else. The Visible Human Project (VHP)[4] is the third. It has proved that applications can be developed rapidly, interchanged, and layered on one another when built on a common database of image information. Health Level 7 (HL7)[5] and LOINC[6] collectively represent the fourth. They identify the requirement for exchange of information between heterogeneous systems so that each understands the content of the other.

Medicine has evolved from supportive care, through grouping of findings, into diagnoses and understanding of pathophysiology, to molecular biology and genetic reengineering. Medical informatics is likely to follow an analogous course. We cannot afford to give up on the search for universal truths. In some cases we will build truth instead of discovering it. In time, I expect that we will develop an equivalent to the genetic code for health information, one that lets us easily link and relate information. We will define receptor systems that allow us to build system components that can have a predictable effect on any infrastructure in the same way that a beta blocker produces a pre-

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dictable effect in different people. The interaction of human being and machine may stay a local science of design. But it will be easier to tackle with an information infrastructure based on universal truths.—WILLIAM W. STEAD

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