

Currents in Medical Informatics

The Woods Hole Experience

➤ *How a weeklong intensive course provides a deeper understanding of the interrelated disciplines involved in medical informatics.*

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EVERY SUMMER THOUSANDS OF RESEARCH SCIENTISTS MIGRATE TO Woods Hole, Massachusetts, to take advantage of its vast array of marine species, products of the nearby confluence of two distinct Atlantic Ocean currents. Over the past 100 years it has become a scientific Mecca, home to such venerable institutions as the Marine Biological Laboratory (MBL) and the Woods Hole Oceanographic Institution (WHOI), among others. The atmosphere is collegial, complete with campus-like buildings full of lecture halls, libraries, wet labs, and computer stations. (See Figure 1.)

This unique educational environment offers the perfect setting to study medical informatics, itself a confluence of many different occupational "currents." A special migration occurs every spring and fall—30 select medical educators, medical librarians, health administrators, and junior medical faculty converge for The Medical Informatics Course for Health Professionals, a week-long fellowship program sponsored by the National Library of Medicine (NLM) in conjunction with the MBL. These fellows, representing a wide range of occupational settings, educational backgrounds, and computer expertise, seek solutions to challenges at the crossroads of computer technology and health care information. (See Figure 2.) Some arrive com-

pletely unfamiliar with the field; others are already working medical informaticians in all but title. By the end of the week, the fellows have a clearer picture of the scope and promise of medical informatics and how they might contribute to the field.

Since starting the program in 1992, the NLM's goal has been to impart knowledge of the critical information and computer science resources and tools healthcare professionals (who might also be described as budding medical informaticians) need to succeed. At the opening night reception for the Fall 2000 course, NLM Director Donald A.B. Lindberg, M.D., encouraged the fellows to become "agents of change" in their institutions, increasing the visibility and reach of the field. With hundreds of applicants vying for the 60 fully-supported slots in the spring and fall programs, the most important criteria for selection was each fellow's ability to "go back and make a difference." Lindberg urged fellows to take full advantage of their week—"Don't go away with any burning questions about medical informatics."

The complete immersion approach of the program, which is designed as a survey course, provides plenty of opportunities for fellows to get answers to those burning questions. Fellows attend conceptual sessions during the day and hands-on, skills-building technical workshops in the evenings. Classes are taught by some of the field's most accomplished medical informaticians, who often make themselves available for informal consultations throughout the week, taking meals in the MBL cafeteria and joining fellows at the local watering hole after evening sessions. Fellows cite this accessibility to some of the world's foremost health information technology experts as one of the most valuable benefits of their week in Woods Hole.

The Fall 2000 fellows could be roughly divided into three occupational categories: librarians, clinicians, and educators. Many librarians, such as Christine Frank, M.L.S., associate director, Library of Rush University in Chicago, IL, expressed a desire to learn more about the clinical record and how to interface bibliographic and clinical resources. Kate Kelly, M.L.I.S., senior librarian for knowledge management outreach at Massachusetts General Hospital's Treadwell Library in Boston, wanted to "explore the role of the medical librarian within medical informatics." Kay E. Wellik, M.L.S., director of libraries, Mayo Clinic in Scottsdale, AZ, expressed an interest in consumer informatics, specifically how Web-enabled technologies might facilitate communication of health information to consumers.

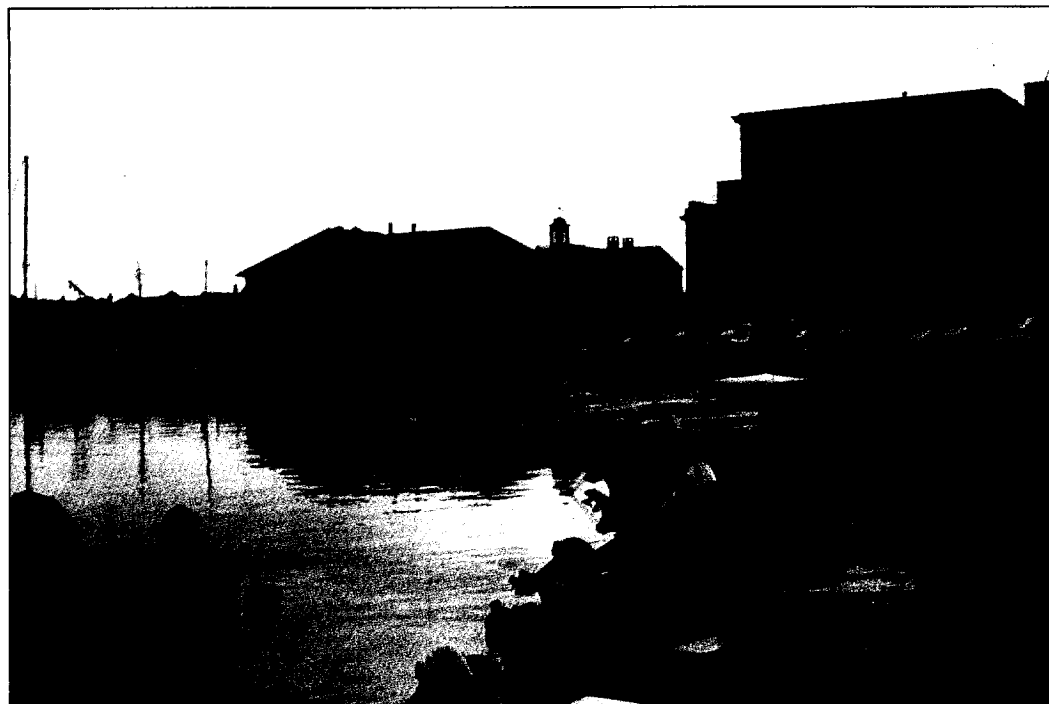


Figure 1. At the Woods Hole "college campus," many buildings overlook the lovely Eel Pond, one of the few distractions during a weeklong course on medical informatics.

Overall, the librarians were concerned with better managing the flow of health information to the public as well as to researchers and students.

Clinicians, in general, were concerned with improving delivery of services. Clifford Amend, M.D., medical director at MediCare First, Baltimore, Md., foresees "big changes in the next 10 years" and wants to lead his institute to develop their own systems, thereby decreasing

reliance on vendors. He expected attending the course would also validate his request for a title change from medical director to director of medical informatics. James L. Gamble, R.N., case manager and critical care nurse at what is arguably the most remote healthcare center in the U.S., located just a few miles south of the Arctic Circle in Maniilaq, Alaska, spoke of plans to develop an immunization program and a case management system. Along

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with exploring the specifics of telemedicine and integrating systems, he wished to gain "a wider view of the field, its possibilities and directions, and the tasks ahead."

Health educators sought guidance on how to integrate medical informatics into their curricula to better prepare medical students for the technical and professional demands of a rapidly changing field. Steven L. Dain, M.D., an associate professor of anesthesiology at the University of Western Ontario, expressed a desire to learn more about teaching informatics and using the Internet as a teaching tool. "Medical students' and residents' knowledge of basic computing is very thin...basic computer skills must be integrated into the medical school curriculum," Dain noted. Kathleen M. Murray, an associate professor at the Consortium Library, and manager of the Health Sciences Information Service at the University of Alaska, expressed an interest in computer-human interface issues, noting their impact on distance-learning students in her state.

Other fellows wished to learn how to network information resources; use telecommunication technologies to better serve those

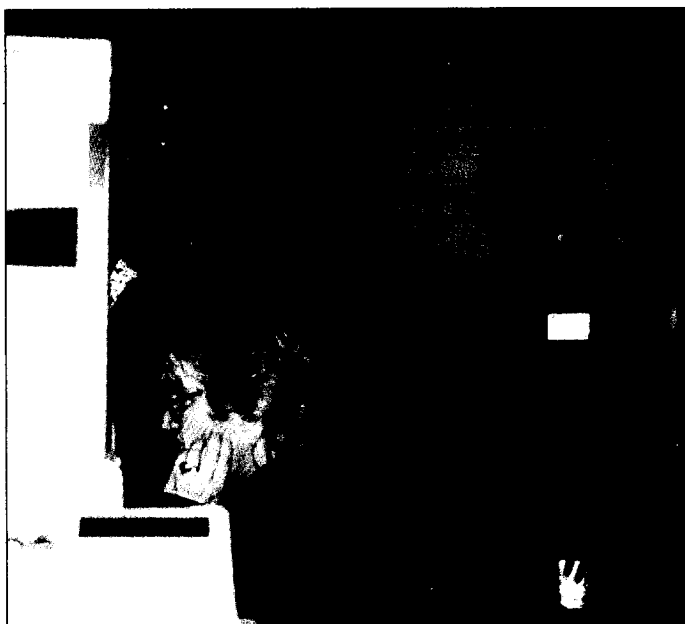


Figure 2. Fellow Vera Taylor, faculty development program director at the Morehouse School of Medicine in Atlanta, Ga., standing in the computer lab at Woods Hole.

Program Details

How To Apply

For more information about the program or for those who are interested in applying to the NLM's Medical Informatics Course for Health Professionals, please visit http://courses.mbl.edu/Medical_Informatics/index.html. The application deadline for each year's sessions is around the first of March.

Fall 2000 Statistics (special thanks to spring Course Chair Daniel R. Masys, MD, who compiled the following data)

Occupations:

12 health science librarians/library administrators
13 faculty members
9 physicians
3 program managers
3 hospital administrators
1 pharmacist

Settings:

19 university
7 community/corporate
2 federal agencies

Geographical Distribution:

3 each: MA, PA
2 each: AK, AL
1 each: AZ, CA, CT, DC, GA, IL, IN, LA, MD, MI, NC, NM, TN, TX, VA, WA, and Canada

Education:

9 M.D., M.B.B.S., D.O.
3 Ph.D.
11 M.L.S. or M.L.I.S.
2 R.N.
13 "other" Masters: M.S., M.A., M.B.A., M.P.H.

The Faculty

Additional faculty at the Fall 2000 course included:

Suzanne Bakken, D.N.Sc., R.N., Professor of Medical Informatics and Nursing, Columbia University

Christopher Cimino, M.D., Associate Professor of Clinical Neurology, Albert Einstein College of Medicine

Charles P. Friedman, Ph.D., Director and Chief, Center for Biomedical Informatics, University of Pittsburgh

Lawrence Kingsland, Ph.D., NLM, Assistant Director for Applied Informatics

Robert Jenders, M.D., M.S., Assistant Professor, Department of Medical Informatics, Columbia University

Annette Nahin, National Center for Biotechnology Information.

Douglas Perednia, M.D., Director of the Telemedicine Research Center

Justin Starren, M.D., Ph.D., Assistant Professor of Medical Informatics and Radiology, Columbia University

falling through the cracks in the healthcare system; develop secure systems to allow patients' access to their medical records and data sharing among institutions; and to provide "point-of-care" information to reduce medical errors and improve quality of care. Beatriz G. Varman, M.L.I.S., assistant director for public affairs, Houston Academy for Medicine-Texas Medical Center Library, offered perhaps the most unique goal—applying medical informatics to help translate health information for the Spanish-speaking population.

Common concerns appeared as well—how to take advantage of emerging technologies most effectively, how to avoid "reinventing the wheel," and how to forge a career in medical informatics out of disparate professional responsibilities, often at institutions where the field is largely unknown. Many said their medical informatics skills

were self-taught and they wanted to fill gaps in their basic knowledge of computers, networks, applications, and medical systems.

The program offered something for everyone. The first day began with an interactive discussion of the definition of medical informatics, led by spring course chair Daniel R. Masys, M.D., director of biomedical informatics, UCSD, and fall course chair James J. Cimino, M.D., an associate professor of medical informatics at Columbia University. The rest of the first day provided an overview of NLM tools and initiatives such as Medline, PubMed, Grateful Med, the Unified Medical Language System, and the Visible Human Project. Dr. Lindberg discussed public policy issues, providing updates on the status of the High Performance Computing and Communication Act, Next Generation Internet, Internet2, and other initiatives. In the first evening workshop, the fellows created personal Web pages with invaluable links to the new contacts made during the intense week-long program. Fellows chose PC or Mac platforms, and lab assistants helped those less familiar with computer systems during more technical sessions and evening workshops.

On the second day, David Wheeler, Ph.D., of the National Center for Biotechnology Information, provided an introduction to molecular biology information resources. Alexa T. McCray, Ph.D., director of the Lister Hill National Center for Biomedical Communications, discussed the NLM's Digital Library. Dr. Lindberg gave an overview of the

Commentary by Course Coordinator

The composition of fellows has changed over the years. "In the beginning, the program attracted older professionals, deans and physicians who were faced with making decisions about purchasing technology or needing to learn how to work with IT departments. Now the program attracts younger professionals, who have more specific questions about the uses of information technology in healthcare and research," notes course coordinator Cathy Norton, director of the MBL/WHOI Library and principle investigator on the NLM contract.

Norton is pleased by the number of fellows who pursue further studies in the field, such as Kathryn Hornby, D.M.D., M.L.S., Woodward Biological Library, who enrolled in the Graduate Certificate Program in Medical Informatics at Oregon Health Sciences University as a result of her experience at the Fall 1999 Woods Hole course. Others, like Patricia M. Sarchet, medical anthropologist and information specialist at the University of Buffalo, find that the multidisciplinary nature of the field allows them to make contributions without having to leave their own areas of expertise and start over professionally or academically.

Sarchet and several other "WoodsHolders" set-up a reunion for fellows in conjunction with the Medical Library Association meeting in Vancouver this past spring. "I love this group of people," Sarchet explained, "and I really believe that networking is key—what a great group to do that with."
—A.B.

Health Insurance Portability and Accountability Act (HIPAA) and several encryption, privacy, and security standards under development. David Remsen, MBL bioinformatics manager, reviewed the principles of Web design. The evening workshop offered fellows a hands-on introduction to personal databases.

The rest of the week focused on a broad range of informatics skills and subspecialties, including data capture, speech recognition, messaging, XML, natural language processing, principles of database and Web design, clinical data systems architecture and organization, principles of controlled terminology, evidence-based practice, telemedicine, education informatics, and evaluation methods. Fellows received detailed introductions to each topic, followed by question-and-answer periods and hands-on exercises and demonstrations.

The Fall 2000 program received high marks for its content and faculty. The course curriculum is updated every spring and fall so that fellows always receive the latest snapshot of the field. Those attending the Fall 2000 course, for instance, saw the unveiling of two new tools under development by the NLM: Gateway and ClinicalTrials.gov. Gateway will provide an "entrance to the knowledge resources of the National Library of Medicine," mining all NLM resources instead of requiring users to search Medline, PubMed, Grateful Med, etc., separately. ClinicalTrials.gov will provide a searchable database of government trials leading up to published studies, as well as update patients and their families on studies recruiting subjects.

After "swimming in the currents" of medical informatics for a week, some fellows felt the program would help them in their careers, whereas others were inspired to pursue a doctoral or postdoctoral program in medical informatics. Some fellows thought meeting their peers from other disciplines and settings, including academic, government, corporate, and community, was nearly as valuable as the course itself. For many, this more intimate, informal networking was their first experience of the cross-pollination endemic to medical informatics. In general, taking the course opened up the field, increasing fellows' understanding of the interrelated disciplines involved in medical informatics, and supplying the tools and motivation to pursue more in-depth study. **MD COMPUTING**

Freelance writer Andria M. Brummitt, director of Leapfrog Communications, is also former publications director for the American Medical Informatics Association.

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