

DEPARTMENT OF HEALTH AND HUMAN SERVICES

**NATIONAL INSTITUTES OF HEALTH
NATIONAL LIBRARY OF MEDICINE**

**BOARD OF REGENTS
MINUTES OF THE 116TH MEETING
September 23-24, 1997**

**BOARD ROOM
NATIONAL LIBRARY OF MEDICINE
BETHESDA, MARYLAND**

**DEPARTMENT OF HEALTH AND HUMAN SERVICES
PUBLIC HEALTH SERVICE**

**NATIONAL LIBRARY OF MEDICINE
BOARD OF REGENTS**

**Minutes of Meeting
September 23-24, 1997**

The 116th meeting of the Board of Regents of the National Library of Medicine was convened on September 23, 1997, at 9 a.m., in the NLM Board Room, Building 38, National Institutes of Health (NIH), Bethesda, Maryland. The meeting was open to the public from 9 a.m. to 3:15 p.m., followed by the closed session for consideration of grant applications until 3:45 p.m. On September 24, the meeting was reconvened and open to the public from 9 a.m. until adjournment at 12:30 p.m. Dr. Michael DeBakey presided as Chair.

MEMBERS PRESENT

Dr. Michael DeBakey, Chair
Dr. Tenley Albright
Dr. Marion Ball
Dr. Enriqueta Bond
Dr. Sherrilynn Fuller
Dr. Raymond Fonseca
Mr. John Gage
Ms. Michele Klein
Dr. George Nolan

EX OFFICIO MEMBERS PRESENT

Ms. Wendy Carter	Mr. Keith Russell
Dr. Mary Clutter	Gen. Klaus Schafer
Dr. Kathleen McCormick	Capt. William Wurzel
Col. Kristen Raines	Dr. James Zimble
Dr. Richard Rowberg	

MEMBERS OF THE PUBLIC PRESENT

Dr. Howard Kipen, Institute of Medicine
Ms. Cathy Liverman, Institute of Medicine
Dr. Clement J. McDonald, School of Medicine, Indiana University
Dr. Steven Phillips, Iowa Heart Center/Mercy Hospital Medical Center
Mr. John Scott, Center for Public Service Communications

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Dr. Kenneth Walker, Emory University School of Medicine
Ms. Lisa White, "Blue Sheet"

FEDERAL EMPLOYEES PRESENT

Dr. Donald A.B. Lindberg, Director, NLM
Mr. Kent A. Smith, Deputy Director, NLM
Dr. Harold Schoolman, Deputy Director for Research and Education, NLM
Dr. Michael Ackerman, Assistant Director for HPCC, NLM
Ms. Suzanne Aubuchon, Office of the Director, NLM
Mr. Richard Banvard, Lister Hill National Center for Biomedical Communications/NLM
Mr. Fernando Burbano, Director, Information Systems, OCCS/NLM
Ms. Susan Buyer, Office for Health Information Programs Development, NLM
Ms. Kimberly Caraballo, Committee Management Assistant, NLM
Ms. Patricia Carson, Office of the Director, NLM
Mr. Peter Clepper, Division of Extramural Programs, NLM
Mrs. Lois Colaianni, Associate Director for Library Operations, NLM
Dr. Milton Corn, Acting Associate Director for Extramural Programs, NLM
Dr. Donald Frederickson, Scholar in Residence, NLM/ Director Emeritus, NIH
Ms. Kathleen Gardner, Office of Inquiries and Publications Management, NLM
Robert Gwadz, National Institute of Allergy and Infectious Diseases, NIH
Ms. Carol Haberman, Lister Hill National Center for Biomedical Communications/NLM
Mrs. Frances Howard, Office of the Associate Director, OEP/NLM
Ms. Betsy Humphreys, Assistant Director for Health Services Research Information, NLM
Ms. Marjorie Cahn, National Information Center on Health Services Research and Health Care Technology, LO/ NLM
Ms. Bonnie Kaps, Committee Management Specialist, NLM
Mr. Sheldon Kotzin, Bibliographic Services Division, LO/NLM
Dr. Lawrence Kingsland III, Assistant Director for Applied Informatics, NLM
Ms. Kristine Markovich, Library Associate, LO/NLM
Ms. Tammy Mays, Library Associate, LO/NLM
Dr. Alexa McCray, Educational Technology Branch, LHNCBC/NLM
Mr. Robert Mehnert, Office of Inquiries and Publications Management, NLM
Mr. Dwight Mowery, Grants Management Office, OEP/NLM
Ms. Roxanne Nelson, Library Associate, LO/NLM
Mr. Donald Poppke, Executive Officer, NLM
Ms. Julia Royall, Office for Health Information Programs Development, NLM
Ms. Alberta Sandel, Office of the Director, NLM
Dr. Elliot Siegel, Associate Director, Health Information Programs Development, NLM
Ms. Peggy Schnoor, Office of Science Policy, OD/NIH
Ms. Rebecca Smith, Library Associate, LO/NLM

Dr. Zoe Stavri, Library Operations, NLM
Ms. Anita Tannenbaum, Office of the Director, NLM

I. OPENING REMARKS

Board Chairman Dr. Michael E. DeBakey welcomed the Regents and guests to the 116th meeting of the Board of Regents of the National Library of Medicine. He noted that circumstances surrounding the Library and the Board had altered considerably since he last sat in the Chairman's seat—in 1960. No one then could have envisioned the role that the Library plays today on the American health scene. He has served on many boards over the years but he finds it especially gratifying to be associated with the National Library of Medicine. Dr. DeBakey welcomed two past chairmen who were in attendance—Dr. Steven Phillips and Dr. Kenneth Walker. He noted two newly appointed Regents, Dr. Jordan Baruch, President of Baruch Associates in Washington, D.C., (who was unable to attend) and Ms. Michele Klein, Director of Library Services of the Children's Hospital of Michigan (Detroit). He also welcomed several ex officio alternates.

II. REMARKS BY THE DIRECTOR, NIH OFFICE OF ALTERNATIVE MEDICINE (OAM)

Dr. Wayne Jonas reported to the Board about the inception of the Office and described some of its current activities. "Unconventional" medicine ("complementary" medicine is a more accurate term) is used by about one-third of all Americans. Unfortunately, many patients don't tell their doctors about their use of other practices or remedies. There is a growing number of physicians who either incorporate complementary medicine techniques into their practices, or are willing to refer patients to alternative practitioners. Dr. Jonas described some of these practices: relaxation and biofeedback techniques, massage, hypnosis, acupuncture, meditation, herbalism, imaging, spiritualism, homeopathy, energy medicine, and vitamin therapy. He said that today's medical students are more receptive to complementary medicine than previous generations, so interest in it will increase. MEDLINE (1966 to 1995) has a Medical Subject Heading term "alternative medicine," and the number of citations tagged with this term is growing about 12 percent each year. He briefly described some of the clinical trials now being conducted on various alternative medicine therapies. Last year there was an NIH-sponsored consensus development conference on the use of biofeedback and relaxation techniques to treat pain and insomnia. There are certain areas for which there is a paucity of research, for example, alternative treatment for cancer. Also, there is an increasing trend for patients to want to participate in decisions affecting their treatment—to become "partners" in their health care. Practitioners of alternative medicine frequently emphasize this aspect of health care. The Office of Alternative Medicine, created by Congressional mandate, facilitates research in these areas and has created an information clearinghouse and a research training program. The clearinghouse responds to more than 1,200 public inquiries a month and over 100 media calls. A

toll free phone line has been installed, and there is now an OAM Web site. Funding has increased steadily: this year it is \$12 million. Most of the OAM research is being conducted through 10 alternative medicine centers around the country; they are funded through six NIH institutes. A chiropractic center will be added this year. NIH institutes support and conduct research on alternative medicine—some 140 projects in 16 categories totaling \$44 million are being supported. Categories include mind/body medicine, behavioral techniques, diet and nutritional supplements, and lifestyle and disease prevention. The OAM, which has an international liaison section, works with the World Health Organization to develop joint projects. OAM is developing a database: a MEDLINE search on “alternative medicine” will yield 30,000 citations. Using additional, non-MeSH terms will greatly increase that number. Dr. Jonas said that they have identified some 400 journals devoted to complementary medicine and he showed the Board samples of several. There are more than 80 databases devoted to the subject. The quality of both forms varies tremendously, he said. Dr. Jonas answered several questions from the Regents about unconventional approaches to cancer treatment, the AMED (Alternative Medicine) database, and conferences that the OAM has sponsored.

III. CONSIDERATION OF MINUTES OF PREVIOUS MEETING

The Regents approved without change the minutes of the May 13-14, 1997, meeting.

IV. FUTURE MEETING DATES

The Board of Regents will meet next on January 27-28, 1998. Next spring's meeting will be May 12-13, 1998. The proposed date of September 22-23, 1998, was accepted and confirmed for the meeting next fall.

V. REPORT FROM THE NLM DIRECTOR

Dr. Lindberg reported that the NLM will close out the Fiscal Year with an operating budget of \$150,376,000. The President's request for FY 1998 was almost \$156 million; the two proposals from the House and Senate are somewhat higher than that, but no joint figure has been arrived at. All figures carry earmarks for High Performance Computing and Communications and for genetic-related programs. It is unclear whether a new budget will be in place by September 30. In the area of personnel matters, Dr. Lindberg noted that Dr. Roger Dahlen and Ms. Ruth Bortz have retired from the Extramural Programs. He introduced Dr. Kenneth Address, who was selected to receive an NIH Postdoctoral Intramural Research Award with NLM's National Center for Biotechnology Information. He introduced Dr. Zoe Stavri, head of the NLM Library Associate Program, who presented to the Board the four new Library Associates: Ms. Kristine Markovich, Ms. Tammy Mays, Ms. Roxanne Nelson, and Ms. Rebecca Smith. Dr. Lindberg announced that the scope of the Library Associate Program is being expanded by increasing the number of fellows and adding an optional second year. Dr. Lindberg said he took great pleasure in announcing the selection of

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Dr. Alexa McCray as the new Director of the Lister Hill National Center for Biomedical Communications. He then presented to her the NIH Director's Award "for innovative research in medical language processing and leadership in the conceptualization of the Unified Medical Language System Semantic Network and Knowledge Source Server."

Dr. Lindberg reported briefly on upcoming September 30 hearings before Mr. Bilirakis's House subcommittee on the subject of NIH reauthorization legislation. Several NIH programs have been selected for highlighting, including NLM's Visible Human Project and the NCBI. Dr. Lindberg also reported on a new joint initiative of the CDC, NLM, National Network of Libraries of Medicine, and several organizations of state and local health officials, called "Partners in Information Access for Public Health Professionals." Many public health agencies have very poor access to information resources; this initiative will help to improve the situation. An item reported to the Board in the past, the "Health Insurance Portability and Accountability Act of 1966" (called Kassebaum-Kennedy or K2), requires the establishment of standards for and the development of electronic medical records. A one-day public meeting of the HHS Committee on Health Data Standards was held at NIH in July; notices of proposed rule-making are now being prepared for publication in the fall. NLM supported a study conducted by the Institute of Medicine that resulted in an excellent report on the issue of health data privacy. Copies will be provided to the Regents. The National Committee for Health and Vital Statistics, which was given new authorities under K2, is recommending that, before a personal patient identifier can be put into place, there must first be medical data privacy legislation acted. Dr. Lindberg noted that NLM has been involved in two press conferences since the last Board meeting: the June 26 announcement of "free MEDLINE (which the Board will hear about later) and the August 1 announcement of the National Cancer Institute's Cancer Genome Anatomy Project, in which the NLM and the NCBI played a role. The announcements were both made by Vice President Gore. He told the Board that NLM, finally, has an "uninterruptible power supply" that can withstand power failures in the Bethesda area; it proved its worth within a few days of being installed, when a July thunderstorm briefly knocked out the area's power. On October 30, NLM will open a new major exhibit in the rotunda area: "Frankenstein: Penetrating the Secrets of Nature." It is being put together by NLM's History of Medicine Division. The exhibit will stay up well into 1998; Board members are invited to the opening on October 30. Dr. Lindberg reported that the new online file—OLDMEDLINE—is being expanded with data from 1962-63. We recently found that all 6,342 keywords in OLDMEDLINE could be matched with current Medical Subject Headings terms. The next step is to write a conversion program that will automatically replace the old headings with new. Finally, the NLM Director reported that a draft report from the Long Range Planning Panel on International Programs is being prepared for presentation to the Board of Regents at its next meeting. Their deliberations have already had some tangible benefit for the NLM: the Fogarty International Center (a party to the Panel's discussions) has agreed to help fund an expanded international training program for NLM.

Following Dr. Lindberg's presentation, Dr. DeBakey led a general discussion about the desirability and need to make older bibliographic information available online. Michele Klein noted that not

only will it be valuable for research purposes, but that it will save much space on library shelves now devoted to pre-1966 volumes.

VI. MULTILATERAL INITIATIVE ON MALARIA

Dr. Elliot Siegel, NLM Associate Director for Health Information Programs Development, briefly recounted how the malaria initiative began earlier this year, when Dr. Varmus and senior NIH officials met with other leaders of the international scientific community in Dakar, Senegal, to discuss building up the research capacities in Africa. Malaria was targeted for special emphasis, and it was suggested that there might be a role for NLM in the medical informatics aspects of the research and improving communication among scientists in this area. The new PubMed system, Dr. Siegel said, which permits MEDLINE access to anyone with connection to the World Wide Web, can be an important contribution. In July, at a follow-up meeting in The Hague, attended by NIH officials (including Dr. Siegel and Board member Dr. Enriqueta Bond, who also represented the Burroughs Wellcome Fund), Dr. Siegel formally accepted the challenge to NLM of working on the informatics issues and communications and he set up a Communications Working Group to coordinate the effort. He presented a draft plan to the Board of Regents that had been sent by e-mail several weeks ago to senior WHO and other international agency officials who had attended the Dakar and The Hague conferences. Responses so far have been favorable and there will be a meeting to finalize it in the next couple of months. The strategy is to identify countries in which there is substantial interest in malaria by NIH and international agencies and in which there are good prospects for establishing an Internet node. The Communications Working Group will deal with the "last mile" connection—from the malaria research sites to the gateway node. Dr. Siegel briefly outlined the half dozen steps in the plan: identify targets of opportunity, identify the actual needs of the local scientific community, identify technology and communications capabilities already in place, develop realistic costs estimates and implementation timetables, train users and build up local library collections, and to establish a sustainable local presence capable of maintaining and keeping up with the technology. We have already begun to implement and test part of the plan in Mali. Dr. Siegel introduced Dr. Robert Gwadz of NIH's National Institute of Allergy and Infectious Diseases and John Scott, a telecommunications expert with the Center for Public Service and Communications, who discussed the work in Mali to date.

Dr. Gwadz showed slides of the Republic of Mali, the people at risk for malaria there, the mosquitoes that carry the disease, and the Malaria Research and Training Center located on the campus of the National School of Medicine in Mali. The Center is unusual in that it is actually run by Malians, not expatriates. Dr. Gwadz said one cannot overestimate the importance of biomedical communications in Mali—north and south within the country, with other countries, and, most importantly, between the Francophone and Anglophone communities. These are serious barriers. The second great need is to access the biomedical literature. The medical library at the school is poorly equipped. The ability to search MEDLINE and to acquire copies of journal articles is greatly needed. Things move slowly; Internet service was scheduled to come to Mali in October 1996—it

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isn't quite there yet. If we want the scientists of Africa to be full partners in research, we must give them access to the world of electronic information. With the new NIH/NLM initiative, this is now closer to reality.

Mr. John Scott, who recently returned from Mali, assessed the state of the current communications infrastructure there. Most of the telephone lines in the capital are more than 50 years old. The traditional government telephone monopoly, although it is antiquated, it is receptive to commercial modernization. AID experts estimate that the required Internet connectivity would cost \$30 to \$50 per month for 10 hours, but there is no final rate structure yet. "Store and forward" e-mail service is now being provided at the Malaria Research and Training Center. There are now some 16 messages a day—they get charged for messages sent and received. Mr. Scott showed slides of the Center, the medical school campus, and the medical library. The microcomputers they have are current and heavily used, but are not connected either to the Internet or even in a LAN. They will require training on the Internet and on accessing electronic information sources. It would be better to send someone from the United States to Mali to conduct such training on their own equipment than to have them come to the United States.

Following Mr. Scott's presentation, Dr. Enriqueta Bond said that the scientific opportunities in malaria research, particularly on vaccines, were very exciting. Research is the key to controlling malaria in the future. She was encouraged by the commitment of both the international research groups but also the international development agencies. The NIH leadership in malaria research has reenergized the research. She complimented Dr. Siegel and his team who have done a "thorough prospecting of the terrain." NLM is right to emphasize the "last mile connection" and to develop the capability of the scientists, faculty, and students in Mali to access and to use the information.

VII. AWARD

Chairman DeBakey presented the Regents Award for Scholarship or Technical Achievement to Mr. Frank Walker of the Communications Engineering Branch of the Lister Hill Center.

Mr. Walker was honored for "the design and development of DOCVIEW and original engineering accomplishments and significant attainments in facilitating access to biomedical literature over the Internet."

VIII. NEXT GENERATION INTERNET

Dr. Lindberg said that the Administration wishes to build on the success of the High Performance Computing and Communications program with a new initiative called the Next Generation Internet. A Presidentially appointed advisory committee has been formed, on which Regent Sherrilynne Fuller serves. Dr. Michael Ackerman, NLM Assistant Director for High Performance Computing and Communications, then presented some details of the program. When the President's budget came out, there were five funded NGI agencies—DARPA (DOD), DOE, NSF, NIST, and NASA. These

are the major research agencies interested in building the superhighway. Other interested, “unfunded” agencies—NLM and NOAA—are concerned with applications for the superhighway. Dr. Ackerman then described some of the potential NGI applications in medicine, including high-resolution imaging in telemedicine, real-time interactivity in telemedicine, and a multimedia medical reference library for patient records. The guarantee of unfailing, high-quality service is an overarching need for all of these applications. Dr. Ackerman then showed a brief segment from a video made several years ago by Hewlett-Packard that shows how telemedicine could be used by an emergency room physician.

Following Dr. Ackerman’s presentation, Dr. Lindberg described his presentation to an NGI subcommittee in April in which he was representing NIH. He said that NIH has the responsibilities and programs to qualify it as a major participant in NGI. Key priorities for NIH are telemedicine, human genome, health data privacy, and health information for the public. Dr. Lindberg also talked to the subcommittee about the need for remote sharing of national research resources. Remote sharing—and daily updating—of data from national clinical trials is another great potential benefit for biomedicine. He then briefly described several specific telemedicine projects supported by NLM and NGI-related projects supported by components of NIH. As to authorization and funding, Dr. Lindberg said that at a recent hearing of the House science committee to review the authorizations for the major research agencies, there were presentations about NGI. Dr. Ted Shortliffe testified persuasively that there should be health applications people involved in the evolution of the NGI.

Following these presentations, Dr. Sherrilynn Fuller described the composition and work to date of the President’s committee that she serves on. A subcommittee on NGI was formed to work with the funded Federal agencies. She said that it is apparent to the committee that too often the agencies do not work together. Building the highways without building applications at the same time doesn’t make sense, she said. The need for health applications is one area that is understandable by the Congress; they can see the payoff. The “people” aspects are the toughest part, she said, such as security, privacy, and encryption. Dr. Rowberg commented that in some areas (such as energy) there is a feeling that the government need not act, that the private sector will pay for the applications. Those in the health field have a much different view.

IX. INDIANAPOLIS NETWORK FOR PATIENT CARE

Dr. Clement J. McDonald of the Regenstrief Institute, Indiana University, using visuals, reported on the Indianapolis Network for Patient Care (INPC), one of the 19 telemedicine-related projects funded by NLM in 1996. The goal is to investigate the feasibility and benefits of a community-wide medical records system. The investigators specifically targeted six hospital emergency departments in the Indianapolis area. He briefly described the hospitals that make up the network and showed how they relate geographically. There are 100 million coded results in the database, reflecting 1.7 million patients. The data show 800,000 accesses per month. When a patient arrives in the

emergency room an electronic message is generated from the registration system. A variety of data about that patient is provided—such as visit history, lab info, vital signs, chemistry, prescriptions, and dictated reports. A link to a pharmacy chain provides records for 10 million prescriptions. Physicians were surveyed about their satisfaction with the INPC and, although there were shortcomings noted, in general they liked it. It is estimated that the system saved roughly \$11 per visit on an average \$390 charge (although the saving ranged up to \$26 at some institutions). Fifty-five percent of the patients visited the ER more than once; and frequently it was a different ER. Dr. McDonald said that an extension of the project will be to include all the large hospitals in Indianapolis with ER's and also several primary care clinics. Dr. McDonald showed examples of the kind of patient data available through a World Wide Web browser, for example, EKG results and discharge summaries. Among the challenges inherent in the project is that each contributor of data uses a different patient identifier and unique test and measurement identifiers. Also, there is a reluctance to share data, for security and economic reasons, that must be overcome. He described how these challenges were faced and overcome.

Following Dr. McDonald's presentation, Dr. Raymond J. Fonseca asked about physician resistance due to insurance reimbursement and managed care issues and whether medical malpractice issues had been resolved. Dr. McDonald said that the greatest issue was fear and paranoia—participants feared that their records would be analyzed and found wanting. Dr. Steven Phillips applauded the aims and accomplishments of the project; getting accurate records quickly in an ER at 3 a.m. is a great boon to emergency health care. He asked whether third party payers have access to the data. The answer from Dr. McDonald was no.

X. UPDATE: NLM'S HEALTH SERVICES RESEARCH INFORMATION PROGRAMS
Marjorie A. Cahn, Head of NLM's National Information Center on Health Services Research and Health Care Technology, said that the program has three goals: to improve access to the findings of health services research, in both the published and "ephemeral" literatures; to provide researchers with access to the information and data they need to do the research; and to support the information infrastructure for electronic patient record systems. In the area of health data standards and privacy, the Center's major effort is in classification, vocabulary, and code development. They are involved in evaluating the effectiveness of privacy safeguards—the tradeoff between security and accessibility. Ms. Cahn then used slides captured from the World Wide Web to demonstrate three of the NICHSR databases: HealthSTAR (bibliographic citations), HSRProj (citations to both private and federal, state, and local government health services research projects in progress), and HSTAT (full-text, including AHCPR clinical practice guidelines and NIH consensus development conference summaries). The first two are searchable through Internet Grateful Med; there are links to go from IGM to HSTAT and vice versa. Since HealthSTAR and HSRProj were made available free via IGM in June 1997 their usage has increased appreciably. Ms. Cahn described a program the Center has developed to train medical librarians in the use of the databases. They also sponsor a number of exhibits at conferences each year in conjunction with the National Network of Libraries of Medicine.

Following Ms. Cahn's presentation, Wendy Carter complimented the work of the NCHSR staff in developing and making available some very valuable databases. The clinical practice guidelines, which are available in different forms for health care providers and patients, are extremely useful to librarians who use them for providing authoritative information for their patrons.

XI. REPORT FROM EXTRAMURAL PROGRAMS

Dr. Milton Corn reported on the NLM program of grants to support the use of informatics, computers, and telecommunication for education. Dr. Corn pointed out that NLM has had an involvement in educational technology over a period of 12-15 years. In fact, this topic is of such importance it was one of the five major sections of the NLM Long Range Plan. Dr. Corn felt that less has been done in the field of educational technology, not only at NIH but nationally, than in other fields of education. President Clinton and Vice President Gore consider educational technology as perhaps one approach to the serious problem in our country's school systems. Three years ago Congress authorized the NLM to explore educational technology, although no money was appropriated. There has been enormous interest in decision support systems which are basically designed to help the physician and can be a useful educational device. MEDLINE and other systems have been extremely successful. One unanticipated result has been the interest in using the technology to help in educating the "consumer." Another area of success has been virtual procedures that are amazingly realistic. This also has provided an answer to the problem that patients are increasingly harder for medical students to find, so there have been some attempts to make "computer patients." Dr. Corn feels that there is a real future for this area of education and an important field that may benefit more from computers than it has. However, the Library has taken the position not to encourage applications for projects unless the applicant is prepared to evaluate the effectiveness of the work.

Dr. Fuller led the discussion following Dr. Corn's remarks by pointing out that the teaching of anatomy has been greatly changed by the use of computers. These mandatory anatomy programs are viewed by the faculty as very useful. Dr. Corn agreed, although he said that programs that substitute for faculty can be extremely threatening. Ms. Carter pointed out that the Department of Veterans Affairs has a health services research program which emphasizes evaluating applications for the patient population. Dr. Ball emphasized that health science centers are all struggling with the same issues. Evaluation and assessment of these programs is desperately needed. She further pointed out that this issue is very relevant to NLM because the Library encourages use of these enabling technologies and wants to get resources to these institutions. Ms. Klein commented that at Children's Hospital in Detroit they added electronic textbooks and drug databases to the patient care units. Evaluations of this NLM-funded project show that it has saved time and resources.

Dr. Lindberg commented we have to learn to motivate medical students: good medical schools provide information, understanding, and inspiration. Students may be more adept at using the computer than the faculty but are still too often uninspired about clinical medicine.

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Review of Pending Applications - Closed portion of the Meeting Sept. 23, 1997, 3:15-4:00 p.m.

This portion of the meeting was closed to the public in accordance with the determination that it was concerned with matters exempt from mandatory disclosure under Sections 552b(c)(4) and 552(c)(6), Title 5, U.S. Code and Section 10(d) of the Federal Advisory Committee Act, as amended (5 U.S.C. Appendix 2.)

There was a discussion of procedures and policies regarding voting and confidentiality of application materials, committee discussions and recommendations. Members absented themselves from the meeting during discussion of and voting on applications from their own institutions, or other applications in which there was a potential conflict of interest, real or apparent. Members were asked to sign a statement to this effect.

Grant Review

The Board reviewed 74 applications requesting \$32,461,985 and recommended 39 applications with a total cost of \$21,694,088.

XII. FREE WEB-BASED ACCESS TO MEDLINE

Robert Mehnert, NLM Public Information Officer, showed the Regents a 30-minute videotape from the June 26 press conference on Capitol Hill. The conference was hosted by Senators Arlen Specter (R-PA) and Tom Harkin (D-IA) and featured Vice President Gore doing the first "free MEDLINE" search.

A. INTERNET GRATEFUL MED

Following the video, Dr. Lawrence C. Kingsland III, NLM Assistant Director for Applied Informatics, updated the Regents on developments in Internet Grateful Med (IGM). IGM is one of NLM's two routes to searching MEDLINE on the Web. Recent milestones: IGM was introduced in April 1996; it added a self-registration feature in June 1996; in September 1996 the databases AIDSLINE, HealthSTAR, and PREMEDLINE were added to its capabilities; a special version of IGM was introduced to the NLM Reading Room in March 1997; free access was announced in June 1997; the databases AIDS DRUGS, AIDSTRIALS, DIRLINE, HISTLINE, HSRProj, OLDMEDLINE, and SDILINE were added in July 1997; an incoming connection from HSTAT was added in August 1997 and clinical alert searching in September. More than 16,400 new users were registered in the year leading up to the "free MEDLINE" announcement. Dr. Kingsland said that IGM is truly global in scope, serving users from 95 countries. He described some of the technical and architecture improvements and how IGM's capability has been expanded. IGM is now handling more than 400 simultaneous users and there remains plenty of "headroom." A year ago, IGM was handling some 21,000 searches per week; the figure now is 30,000 per day. The busiest time is Tuesday, from 2 to 3 p.m., and 86 percent of the usage is on weekdays. The increased traffic on IGM is reflected in the almost daily, weekly, and monthly smashing of ELHILL mainframe usage

records. Sixty-five percent of users searched only the current MEDLINE file (1994-1997). Dr. Kingsland said that the IGM software is now evolving so that it will do MEDLINE searching in PubMed and search the other databases on ELHILL (until they are moved to PubMed). The user support function for IGM has been successfully transitioned from Dr. Kingsland's team to the MEDLARS Management Services group in Library Operations. There are some problems, he said, including the need for a reliable uninterruptible power supply, the "breaking" of the download process by a change made in the Netscape Communicator 4.0 software, and the need for changes in the action of the Loansome Doc feature (for requesting articles). In conclusion, Dr. Kingsland said that his group is now planning to transfer the operational responsibility for production IGM to NLM's Office of Computer and Communications Systems; this will allow the IGM development team to concentrate on enhancements and new functionality for Internet Grateful Med.

B. PUBMED

Dr. David Lipman, Director of NLM's National Center for Biotechnology Information (NCBI), reported on PubMed usage, interaction with publishers, and plans for PubMed. PubMed, the new Web interface to MEDLINE developed by NCBI scientists, was introduced at the June 26 press conference by Vice President Gore. There are now some 30,000 individual Internet Provider (IP) addresses using PubMed daily; the actual number of individuals searching is much higher. The number of searches per day is estimated at 200,000. Dr. Lipman said that the system as presently figured has the capacity to handle such a large workload and that if IGM is switched over to PubMed there would be no problem with the added workload. As to interaction with medical publishers, he reported medical publishers like PubMed and NLM is thus adding more and more links to publisher Web sites so that searchers can retrieve full text for article references in MEDLINE. Dr. Lipman briefly described some of the negotiations with various major publishers. Not only do users benefit, but the Library is beginning to receive electronic data from the cooperating publishers, thus eliminating the need to keyboard the journal data. NLM saves money and the publishing data so received are available to users on MEDLINE much earlier than material that must be keyboarded. Dr. Lipman also said that NLM is being queried by publishers of medical reference texts who want them linked online to PubMed. This raises the possibility of NLM indexing chapters from such texts and making them available. Finally, Dr. Lipman said that some changes in PubMed are imminent in the next 6 to 8 weeks: the indexing code has been rewritten to make it more flexible and closer to the ELHILL system; and the query parser has been rewritten to make for better synonymy with Metathesaurus and thus better retrieval in PubMed. Dr. Lipman described how various PubMed capabilities could be demonstrated using "diet pills" as a query.

Following the presentations by Dr. Kingsland and Dr. Lipman, regent Michele Klein, who noted at the last Board meeting that the Children's Hospital was having trouble with its Internet Grateful Med connections, was pleased to report that, with the help of NLM's Mr. Burbano and staff, those problems had been completely resolved. She also said that, as the complexity of the system increases, medical librarians would like tools to use for training others. On this latter point,

Dr. Lipman said that the NCBI was working with Library Operations staff to develop tutorial materials, including online training help. Dr. Fuller said that the Regional Medical Libraries would be interested in working with the NLM on developing and deploying such training tools.

XIII. REPORT ON THE SUBCOMMITTEE ON OUTREACH AND PUBLIC INFORMATION

Dr. Tenley Albright reported briefly on yesterday morning's meeting of the Subcommittee. Among the topics discussed: the variety of news reports in recent months dealing with NLM services; several recent press releases issued by the NLM; items in publications like *Ladies Home Journal*, *Good Housekeeping*, and *Consumer Reports*; the possibility of inserting into the storyline of the television show *ER* the use of MEDLINE in an emergency situation; the great interest of the press in telemedicine; Dr. Siegel's outreach initiatives—on malaria in Africa, for American Indians in the Pacific Northwest, and for Internet health information for seniors; the upcoming "Frankenstein exhibit" at NLM; and the development of a brochure for physicians to give their patients.

Dr. Albright read the comments sent by NLM consultant Dr. Lois DeBakey, who was unable to attend the meeting. Dr. DeBakey said that NLM has remained on the cutting edge of improving the dissemination of health information and the positive results of the Library's outreach activities have never been more apparent. She said the recent press conference on Capitol Hill to announce "free MEDLINE" was an excellent example of this. The Board Subcommittee on Outreach and Public Information and the Library staff deserve commendation for this progress, Dr. DeBakey said. After Dr. Albright's report, Dr. Steven Phillips commented that the reason the outreach has been successful is that the core programs of the NLM are seen by the public and the health professions as of great value. He suggested that perhaps NLM should begin an outreach program aimed at mid-career physicians, especially rural and urban patient-care physicians, to demonstrate to them the advantages of having electronic information at their fingertips. Dr. Marion Ball, also a member of the Subcommittee, said that the libraries of the National Network of Libraries of Medicine could be involved in the kind of training Dr. Phillips suggests. Dr. Fonseca suggested that NLM might consider using a resource that is "underutilized and over-qualified"—high school teenagers who could be trained to educate the elderly, physicians, and other groups in the use of online health information resources.

XIV. EVALUATION OF NLM'S TOXICOLOGY AND ENVIRONMENTAL HEALTH INFORMATION RESOURCES BY THE INSTITUTE OF MEDICINE

Dr. Howard Kipen, Director of Occupational Health and Associate Professor of Environmental and Community Medicine at Robert Wood Johnson Medical School, chaired the Institute of Medicine Committee on Toxicology and Environmental Health. At NLM's request this Committee studied the Library's Toxicology and Environmental Health Information Program. Dr. Kipen described the makeup of the Committee, how it undertook its deliberations, and the three meetings it held. The committee solicited information from other health professionals about the TEHIP activities, held

a series of focus groups with users, and distributed widely a questionnaire it developed. The Committee members were struck with the lack of awareness and access by health professionals who should be using the TEHIP services. Although they might be MEDLINE users, they did not know how to use the TEHIP resources. They had trouble distinguishing among the databases available. They also had trouble with negotiating the various search interfaces. Training was also an issue—how it could be obtained and what it would teach them. Among the major issues identified by the Committee: NLM should assess the information needs of the different kinds of health professionals in this area; NLM should apply the same kind of simple search interface it uses for MEDLINE to the TEHIP databases; training and outreach should be targeted to particular groups of health professionals; other databases in the toxicology area should be linked to NLM's TEHIP databases; and TEHIP itself should be strengthened within the NLM structure.

Following Dr. Kipen's presentation, Dr. Melvin Spann, NLM Associate Director for Specialized Information Services, told the Board how the IOM study came about. The resultant study, "Toxicology and Environmental Health Information: The Role of the National Library of Medicine," has seven major recommendations. Dr. Spann described each recommendation briefly and how NLM is planning to respond. As to expanding the scope of TEHIP, NLM will organize and catalog the full spectrum of online information resources in this area and, where possible, link to them online. The NLM will also expand its efforts to understand the information needs of health professionals for this information and do a detailed user profile analysis. NLM will continue and expand its outreach effort and will capitalize on the resources of the National Network of Libraries of Medicine for exhibiting and training. He said that TEHIP was becoming much more proactive in this area, and he gave several examples. Dr. Spann said that NLM will, in the short run, try to simplify how its TEHIP databases are accessed, coordinate an experimental TEHIP Web interface with Internet Grateful Med, and link the TEHIP Web site with the sites of other professional organizations in this area and also establish pointers to TEHIP from Web search engines. Dr. Spann said that they hope to make it possible for users easily to retrieve chemical structure data using common names. Adding the ability to retrieve records by physical signs and symptoms would be a big step forward to retrieving information from the TEHIP files. The recommendation to implement the ability to measure progress is a needed improvement—more than just a method to collect anecdotal information. Finally, Dr. Spann said that they would be creating an online directory and that they would continue to serve as a referral center for those seeking toxicology and environmental health data.

Following the presentations, Dr. Sherrilynn Fuller said that she was pleased to serve as a member of the Institute of Medicine Committee on Toxicology and Environmental Health. Although she does not have any special expertise in this area, she realized after reviewing the issues and hearing from the experts that the subject is of increasing importance to the general public and how communities are taking the lead in finding out about local threats to the environment and what can be done about it. She believes that the NLM is in a position to make a valuable contribution to the public health in this area and that the actions Dr. Spann described are excellent responses to the

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Committee's recommendations. Dr. Fuller said that there needs to be a focus on reaching potential users who do not know about the databases. Also, she suggested that Poison Control Centers around the country are a natural ally of NLM in this effort and could be helpful in outreach and training. She said that an advisory group—perhaps from the Board of Regents—would be of value.

Dr. George Nolan commented that the potential audience for the TEHIP services is enormous, but that the data is difficult to get at and to use. Surveying the users of the information is necessary so that NLM can tailor information services to them. The biggest challenge will be to serve the public; public demand will require changes in the nature of the databases. NLM is to be commended for anticipating the need for changes in its TEHIP databases and services. Dr. Kenneth Walker said that the TEHIP databases are large and expensive to maintain and, compared to other NLM services, not much used. However, the future importance of a host of toxic threats to human health cannot be underestimated, not only in the United States but even more in other countries. Improving search interfaces surely is needed, as is an effort to popularize the databases. Perhaps, however, the "time has not come yet" for the information in this set of databases. We should be patient, make the improvements suggested, and remain confident that the databases will be enormously valuable in the future.

XV. DIGITAL ARCHIVE RECORDS PROJECT

Dr. Alexa McCray, Director of the Lister Hill National Center for Biomedical Communications, demonstrated a project being conducted jointly with staff of the History of Medicine Division that aims at making manuscript and other collections available in a digital format. The first product was the creation of digital files (by scanning and optical character recognition—OCR—methods) and access programs for some 20 cartons of archival materials on the Regional Medical Program (RMP). Using the World Wide Web, Dr. McCray demonstrated some of the electronic RMP resources they created and she described the processes they developed and the problems they had to overcome. In a next step, Dr. McCray and her staff worked with Dr. Donald Fredrickson (former NIH Director) to digitize his papers—documents, photographs, correspondence, etc. Using these digitized materials as a sample, Dr. Lindberg, Dr. McCray and other NLM staff met with NIH Nobel laureates to see if there was interest in a collaborative project that would collect, organize, and digitize their records and papers. The donors would work closely with NLM staff to organize the papers before they could be digitized. There was discussion about whether the resulting materials could be made available not only to scholars but to the public so that they could see how science is done. This would mean taking materials and endowing them with a different point of view, namely, one that would make the information understandable by the public. To see if this was feasible, Dr. McCray's staff worked with Dr. Fredrickson to reorganize how his collection is presented. Using the Web, she demonstrated these two views of Dr. Fredrickson's work.

Following Dr. McCray's demonstration, Dr. Fredrickson emphasized the importance of the donor of papers for archiving being present to help the historians and archivists prepare material for

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digitization. Dr. DeBakey commented that such digital archival materials will be of enormous benefit for future scholars.

XVI. ADJOURNMENT

The meeting was adjourned at 12:30 p.m.

ACTIONS TAKEN BY THE BOARD OF REGENTS:

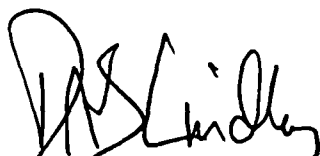
- Dr. Lindberg presented the NIH Director's Award to Dr. Alexa McCray, Director of the Lister Hill National Center for Biomedical Communications "for innovative research in medical language processing and leadership in the conceptualization of the Unified medical language System Semantic Network and Knowledge Source Server."
- Chairman DeBakey presented the Regents Award for Scholarship or Technical Achievement to Mr. Frank Walker of the Communications Engineering Branch of the Lister Hill Center for "the design and development of the DOCVIEW and original engineering accomplishments and significant attainments in facilitating access to biomedical literature over the Internet."

The Board concurred with the recommendations of the Extramural Programs Subcommittee.

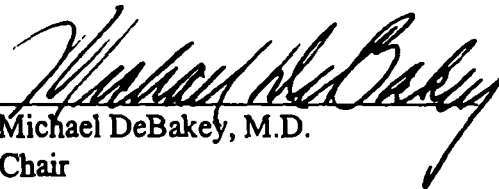
ATTACHMENTS:

- Roster - NLM Board of Regents [Attachment A]
- September 22, 1997 - Extramural Programs Subcommittee Meeting [Attachment B]
- September 23, 1997 - Subcommittee on Outreach and Public Information Meeting [Attachment C]

I certify that, to the best of my knowledge, the foregoing minutes and attachments are accurate and complete.



Donald A.B. Lindberg, M.D.
Director
National Library of Medicine



Michael DeBakey, M.D.
Chair
Board of Regents, NLM