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A REVIEW OF PRESENT PRACTICES  
OF NIH  
IN DISSEMINATING RESEARCH FINDINGS  
TO  
THE PUBLIC, HEALTH PRACTITIONERS AND RESEARCH SCIENTISTS  
WITH  
RECOMMENDATIONS FOR EXPANDED  
AND ADDITIONAL SYSTEMS

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## SUMMARY AND CONCLUSIONS

The Committee on Dissemination of Research Results has reviewed the processes by which biomedical research findings are translated into measures for the prevention, diagnosis and treatment of disease. We focused on the communication of such research findings to the public, to health practitioners and to research scientists. Each group has different needs and has different capabilities for making use of research results. The means employed throughout the health system for communication of research information differ for each target audience.

Approximately 35,000 research findings are reported each year by NIH supported investigators. Comparatively few of these findings are of immediate applicability to patient care, but almost all have potential for becoming important elements in new measures for prevention, diagnosis or treatment.

Such findings are communicated with reasonable efficiency within the scientific community, and the multiple linkages among research laboratories and academic medical centers assure a generally unimpeded flow of information between their scientists and clinicians.

Because of the great volume of relevant scientific knowledge and its rate of expansion we have recommended the continued exploration for and application of new methods for organization and dissemination of scientific information to facilitate and increase its utilization.

Communication of current knowledge to all practitioners is a more complex process and the continuing education of health professionals has long been a concern of academic health centers, professional organizations, and various Federal agencies including the NIH.

We have recommended specific actions for direct communications of medical advances to health practitioners, and pilot studies of new methods for improving dissemination of applicable and current knowledge.

A number of large Federal programs for the health education of the public have concentrated on specific problems (e.g. alcoholism, drug abuse, high blood pressure). Other programs have been carried on by state and local governments, professional organizations and on a large scale by voluntary health organizations.

We have recommended additional direct and comprehensive information programs for the general public, and closer coordination of NIH efforts with other groups active

in the field.

An effective and comprehensive solution for the communication problem, however, can not be achieved by simply implementing a few specific recommendations designed to satisfy needs as now perceived. Changes in the structure of the health delivery system, new developments in biomedical research, and experience with new or revised methods for communication within the health field will require constant surveillance and adaptation. A primary recommendation of the Committee is therefore that there be a central office or unit within the NIH responsible for continued studies of the flow of information resulting from research, for stimulation of improvements, and for coordination of our efforts to improve the dissemination of research results.

It should be stressed that the research activities of the National Institutes of Health, though extensive, are only a part of a very large whole. Similarly there is great diversity in methods and channels for dissemination of research findings. NIH efforts to improve such dissemination must be viewed in the context of a complex of systems.

## RECOMMENDATIONS

1. That a central unit within the Office of the Director, NIH be responsible for stimulating, coordinating and evaluating the Agency's efforts in dissemination of research results. In performing its functions the unit should seek and use the advice of non-Federal health professionals, communications experts and scientists.
2. Promote cooperative efforts with other Federal and non-Federal agencies in carrying out the dissemination of research results.
3. Initiate pilot studies to test the feasibility of establishing regional information centers to promote comprehensive telephonic consultative service for practicing health professionals, based on existing academic health centers and networks of NIH supported categorical disease centers.
4. Prepare and publish in media widely used by physicians and other health professionals a brief monthly review of advances in medical knowledge selected on the basis of their current clinical significance.
5. Utilize fully new communications technology including

the Communications Technology Satellite.

6. Increase support to the National Library of Medicine to expand the National Biomedical Communications network it is developing.
7. Increase the output of health education information for use by the mass media, especially audiovisual and videotape materials for dissemination through radio and television including cable TV and closed circuit television.
8. Conduct a series of national workshops to review existing means of disseminating research information, identifying needed improvements, and suggesting steps for implementation.

## I. INTRODUCTION

This report comprises the results of a study of the systems by which knowledge, developed by the scientific community (and the National Institutes of Health in particular) could more effectively be made available to the public, to practicing physicians and other health professionals, and to research scientists.

As part of this report, an analysis is presented of the current processes by which new and useful scientific knowledge in the health field is assembled, presented and conveyed to those who can make advantageous use of it. Finally recommendations are made concerning the means by which informational systems can be improved, enhanced and expanded, and other innovations developed, with the ultimate goal of making the highest quality of health care available to all.

It is clear that the National Institutes of Health (NIH) is called upon to provide leadership in communicating the results of biomedical research.

The public has an increasing awareness of the importance of research and its relationship to better health. As the principal focus of Federal biomedical

research, the NIH is expected to be a source of reliable and timely information about health--a concern of every citizen. The Congress has recognized this public expectation by making special provision in the National Cancer Act of 1971 and the National Heart, Blood Vessel, Lung and Blood Act of 1972 for public and professionally oriented information programs. Other more recent Acts (Arthritis, Diabetes) have similarly stressed dissemination of information.

The role of the NIH in communication of research results to the health professional community must be re-examined in the light of recent and prospective developments concerning patient care in which the Federal government is vitally involved, as for example Professional Standards Review Organizations, Area Health Education Centers, Health Maintenance Organizations, and National Health Insurance. The apparent termination of Federal support for Regional Medical Programs has brought this issue into focus since continuing education of health professionals and the transmission of research results regarding the major killers, heart disease, cancer and stroke, were its principal missions.

The NIH has long been active in promoting and facilitating communication within the scientific community.

Through the National Library of Medicine it pioneers in new uses of technology to store, retrieve and transmit scientific information for the use of health professional schools, practitioners, and biomedical scientists. Because of its close collaboration with academic medical centers, the NIH has also been an important channel of communication with health science educators and through them to practitioners. Mechanisms for direct communication to the practicing health professional are now being expanded in specific categorical areas (e.g. cancer, heart disease, child and maternal health, arthritis, diabetes, stroke).

This report and its recommendations deal with communication of information comprising all areas of progress in biomedical research, not only to the professional but, as appropriate, to the public as well. Section II of this report analyzes the uses of biomedical research information and describes how it is now being communicated. The analysis points out the kinds of information needed and utilized by three general groups--members of the public, practitioners, and scientists. Section III contains recommendations for improving the dissemination of research findings, including a proposal for the establishment of a central organizational unit within NIH to conduct ongoing studies of the problem and to provide leadership in

generating additional activities in the area of research communication.

In Section IV the current efforts of the NIH to disseminate research-derived information to the public and to health professionals are summarized.

## II. COMMUNICATING THE RESULTS OF BIOMEDICAL RESEARCH

All of the research conducted by or supported through the National Institutes of Health is undertaken in the expectation that it will ultimately contribute to the development of better preventive, diagnostic or therapeutic measures. Good communication is essential to the realization of these anticipated benefits.

Communications links are required at every step in the progression of an idea from laboratory investigation to an innovation in health care. The needs are different at different stages, and useful means of communication will differ accordingly.

This report addresses three critical communications linkages:

scientist to scientist

scientist to practicing health professional\*

scientist to the public

In analyzing currently employed and proposed means for communication it is necessary to distinguish between the kinds of information needed by and useful to the intended recipient.

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\* physicians, nurses, allied health professionals, health administrators and planners

## Scientist to Scientist Communication

In any given year some 35,000 research findings are reported by the individual investigators supported through the NIH. This number is only a portion of the total output of biomedical research.

Such reported findings are, in the main, new increments of knowledge which lead to better understanding of larger questions. These findings are the basic materials from which ultimately, through refinement and combination with other findings, new means of treatment, diagnosis or prevention will be developed.

New measures for health care almost invariably are the culmination of a long series of incremental steps. The "family trees" of such innovations usually have many branches. It would be virtually impossible for an individual investigator to successfully pursue a research question from its conception to the development of an applicable means for therapy without reference to the work of other scientists. Communication among scientists is an integral part of the process of research.

Scientist to scientist communication is accomplished in many different ways. There is constant informal interchange within larger research institutions. A prime

example of such informal communication takes place within the NIH advisory systems. The study sections and other scientific advisory committees of the NIH serve not only to review proposals, but also to provide a significant amount of scientific communication among leaders in biomedical research from all parts of the country. Some 1,500 members of these groups meet at least three times per year at NIH. The effectiveness of this informal exchange is enhanced by the fact that membership on the advisory groups changes from year to year with 350-400 new members being appointed annually as replacements for those whose terms end.

NIH alone sponsors or co-sponsors nearly 800 professional meetings and seminars each year among scientists in the various disciplines. There are hundreds of other meetings held by scientific societies and professional organizations. Informal communications among peers by conference, by mail and telephone are extensive and important.

Formal scientist to scientist communication takes place principally through the more than 2,200 scholarly and scientific journals in which detailed reports of biomedical research are published. In many instances

important findings are published after having been reported by the researcher to his colleagues at scientific meetings. It is unusual for a research finding to be reported initially to other than the scientific community. This tradition provides an important safeguard against widespread dissemination of unfounded or premature announcements and helps to avoid wasteful or possibly dangerous use of erroneous findings. The safeguard results from the fact that scientific journals require that research papers be subjected to critical review as a condition of publication. Similarly, presentation of a paper before a scientific meeting subjects the author to the questioning and critical judgment of his peers.

Scientific literature has two uses:

1. as a mechanism for communicating new results; and
2. as a repository of data which later may be retrieved and used in new ways which had not been considered at the time of original publication.

The recombination of existing data to provide new insights is an important resource for the scientist.

It is our view that even though the traditional formal methods for scientist to scientist communication entail some delay, the advantages of critical review and the opportunities for constructive feedback built into

the system outweigh the disadvantages which may result from the time required for it.

We do not propose any alternative short cuts in the basic methods for communication within the research process, i.e. scientist to scientist communication.

We emphasize, however, the need to continue the refinement and expansion of existing systems for storage and retrieval of research data, and for the development of new methods which will improve the scientists' access to such material. Such efforts should include the publication of comprehensive indexes, periodic compilations and where necessary new primary journals in addition to full exploitation of the capability of technological advances in information processing.

The National Library of Medicine initiated a program for access to biomedical literature nearly 100 years ago. Index Medicus, a guide to the medical literature was first published in 1879. A computerized system for the production of Index Medicus went into operation in January 1964. A by-product of the system makes possible "demand searches" for requesting health professionals, now available as a nationwide on-line information retrieval system for the service of the biomedical community.

A specialized cancer data base has been developed by the NLM in collaboration with the National Cancer Institute and made available to scientists. This system, called Cancerline, is part of the International Cancer Research Data Bank program. This program actively promotes worldwide exchange of information among cancer scientists and dissemination of information to all physicians.

The research components of the NIH now publish two primary journals, the Journal of the National Cancer Institute and Environmental Health Perspectives.

Additionally the NLM publishes 16 secondary journals, indexing and citing current primary literature in specific subject areas. The research components of NIH continually issue monographs, proceedings of scientific conferences, scholarly state-of-the-art reviews, technical reports and general bibliographies. The usefulness of these publications in dissemination of research results, especially to scientists but also to practicing health professionals, has been repeatedly noted. The rationale for NIH publication of such documentation was summarized in a special report in December 1973, which is attached hereto as

## Appendix 2.

The overall mission of the NLM is the efficient and effective assembly, analysis, and distribution of biomedical information. It has been a pioneer in the systematic application of computer technology to the general problems of the storage, retrieval and distribution of general biomedical information. The Library applies these advanced retrieval and distribution systems to the transfer of specialized data to an increasing number of users.\*

### Communication of Research Findings for use by Health Professionals

As previously noted, the output of biomedical research, in terms of individual findings, covers a very broad spectrum ranging from discoveries at the frontiers of biology to readily applicable means of disease prevention, diagnosis or treatment.

Each element in the array of findings is useful, either to the research scientist or the clinician or to both. However, the busy practitioner would not only be inundated

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\* For description of systems see Appendix 3

by the sheer volume if the full output of published results were channeled to him, but would not have time to identify those portions of it which might be applicable to his practice. For this reason it is essential that there be a sorting out process, and that communication efforts be concentrated on the relatively small portion of current research output which is ready for use by the health professional in patient care. Such selection and dissemination is taking place in a great variety of ways. There are many channels of communication to the practicing professional, some are highly structured, others are patterns of custom.

Academic medical centers are key communicators. They take seriously their responsibility for the continuing education of their own graduates and in many instances for health professionals practicing in their geographic area. Specialty and professional organizations support many individual programs of continuing education as well.

The NIH now engages in a very considerable amount of direct communication with practicing health professionals. During 1974 it was a sponsor of 96 seminars and other meetings for practicing physicians attended by more than 10,000.

It responded to more than 80,000 inquiries from physicians by mail or telephone, and prepared more than 170 different publications for the use of physicians, in addition to 135 different publications for physicians to use in patient education. Three-quarters of a million copies of all such publications were distributed upon request to practitioners during 1974.

The National Cancer Program's 17 comprehensive cancer centers are expected to exert a significant impact through effective cancer control demonstration and outreach. These centers are planned to be focal points for community efforts to assure widespread use of the best available methods for early detection and diagnosis of cancer and dissemination of information both at the lay and professional levels. The centers are designed to be places to which individuals and their physicians can turn for information, help and advice.

A comprehensive cancer communication network is now being established, and will conduct its activities in close cooperation with other appropriate organizations within the communities involved.

Similarly, the control and demonstration programs of the National Heart and Lung Institute are built on a

foundation of involvement of health professionals at the local level. Also NHLI's National High Blood Pressure Educational and Sickle Cell Disease Programs have made physician education primary objectives.

The multidisciplinary general clinical research centers supported by NIH at more than 80 medical centers have served as demonstration and communications centers for more than a decade.

Within the National Library of Medicine the Lister Hill National Center for Biomedical Communications conducts and supports a continuing research program to improve the effectiveness and efficiency of biomedical communications. The Center's expertise in telecommunications and satellite communications provides the mechanism to coordinate and provide technical assistance to the biomedical communications activities of all Public Health Service agencies, especially the Health Resources Administration and the Health Services Administration as they relate to continuing medical education. Another Library operational component, the National Medical Audiovisual Center, is pioneering in the production of non-print media for information transfer and learning systems. The reservoir of biomedical communications expertise resident in the NLM and the

capabilities of its operational and development programs provide an unique resource within NIH to help all Institutes improve their information transfer programs.

We should make sure that the NIH is doing all the things it is best qualified to do to facilitate the communication of applicable new knowledge. While we have been unable to discover evidence of serious failure to communicate individual research findings of clinical significance from the laboratory, we recognize that there are gaps which may prevent the timely application of medical advances to all patients.

The improvement of continuing medical education for health professionals deserves additional attention and stimulation. The Institutes, their grantees and contractors as prime sources of new knowledge are obviously key elements in all programs of continuing medical education.

However, we do not believe that the NIH is the best instrumentality through which a new and comprehensive program for continuing education should be mounted. An effort of this magnitude would so divert manpower and funds from the NIH biomedical research mission as to seriously weaken it.

Communication of "Developable" Research Findings

New biologicals, pharmaceuticals or devices discovered through research must pass through development, testing, and production stages to be available in usable form and in sufficient quantity for patient care.

In such instances the pharmaceutical and other health related industrial organizations have an obvious interest in learning of promising research results. The channels of communication for disseminating developable research results to producers are in process of evolution. We believe additional improvements should be made.

It should be noted that in addition to information, the potential producer must have incentive and be able to forecast a reasonable return for his investment in development, testing and production. The patent policy of the government with respect to products which emerge from Federally supported research can be a critical issue in a company's decision to proceed with production. At this time a key case on this question is before the courts.

We believe that the NIH should take steps to assure the alerting of industry to research findings which have potential for development and beneficial use.

## Communication of Research Results to the Public

The general public has at least three levels of interest in the results of research conducted or supported by the NIH.

The first level is proprietary. As taxpayers, people are entitled to know about NIH's policies and mission, and how well it carries out that mission.

The second level is intellectual and inquiring. People are enormously interested in the progress and the findings of biomedical research, because of its intrinsic interest and because those findings can have a profound effect on their lives and health.

The third level grows out of the second and is of direct personal interest. Certain advances in knowledge concern health practices or preventive measures which may be applied by the individual or his family without the help of a health professional (e.g. dental hygiene, proper diet, breast self-examination, avoidance of cigarettes, alcohol and drug abuse).

Further it is essential that the public know of the existence of new measures for prevention, diagnosis or treatment. The dissemination of such information to the

public should when possible be coordinated with information programs for practicing health professionals.

Health agencies at all levels of government conduct programs of health education for the public. The NIH has been responsible for two recent large scale efforts, the National High Blood Pressure Educational Program and the National Sickle Cell Disease Program.

In addition the NIH provides substantive information to the general public on a variety of other diseases and conditions which it has under study--through news releases and news conferences and through regular newspaper columns, radio and television broadcasts, and exhibits.\* In 1974 it responded to more than 800,000 mail and telephone inquiries from members of the public.

Voluntary health agencies (e.g. American Cancer Society, American Heart Association) also provide the public with information about health matters. In fact, health education of the public is one of the major functions of voluntary associations. Agencies of government, including the NIH, work closely with these organizations in helping them to interpret and use new findings and helping to assure an

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\* See Part IV for a summary of current NIH health education.

accurate and timely flow of information.

The Federal focal point for government cooperation with such organizations on health education activities is the newly established Bureau of Health Education, a part of the Public Health Service's Center for Disease Control. That Bureau is also charged with coordinating the Federal effort in health education.

#### Improving the Dissemination of Research Results

In Part III of this report specific recommendations are made for a plan of action to improve the communication of research information. The recommendations are based on the Committee's analysis summarized above. The Committee has been provided extensive information and advice from the constituent Bureaus, Institutes and Divisions of NIH and the other agencies of the PHS. We have conferred with principal officials of the American Medical Association, the Association of American Medical Colleges, and Federation of American Societies of Experimental Biology (FASEB), the research heads of three large pharmaceutical manufacturers and various officials of institutions engaged in innovative biomedical communication activities.

An article regarding the activities of the Committee on Dissemination of Research Results was published in the

FASEB Newsletter in December and in response some 30 scientists submitted comments and recommendations.

It is apparent that there is no single formula for improvements in biomedical communication, nor is it possible for an ad hoc committee to generate a long range comprehensive plan of action. We have recommended several specific actions as beginning steps but our most important recommendation calls for a permanent office within NIH concerned directly with research communications.

The new unit and the NLM will continue to study needs for improvement, seek and evaluate new methods and channels for communication, and promote cooperative efforts with other Federal and non-Federal agencies in carrying out the dissemination of research information.

### III. DISCUSSION OF RECOMMENDATIONS

1. The Committee recommends that a central unit within the Office of the Director, NIH be responsible for stimulating, coordinating and evaluating the Agency's efforts in dissemination of research results. In performing its functions the unit should seek and use the advice of non-Federal health professionals, communications experts and scientists.

We recommend that the office be the focus of NIH efforts to improve the dissemination of research results, and specifically that it:

- A. Organize and provide staff support for a permanent committee of NIH scientists which will:
  - 1) Maintain surveillance of biomedical research results for purpose of identifying findings which should be reported expeditiously to health practitioners, developmental laboratories and the general public;
  - 2) Supervise the preparation of reports on such findings; and
  - 3) Assure their effective dissemination.
- B. Initiate the establishment of a communications

advisory group (or groups) to include external scientists, health professionals, communications experts, representatives of other Federal communications programs, and public representatives. The advisors will assist in developing and maintaining the effectiveness of NIH's dissemination efforts.

- C. Search for new methods of dissemination of research findings and for improvements in systems now utilized.
- D. Consider methods for evaluation as part of the basic design of any new programs to enhance the dissemination of research information. Some of the recommendations proposed herein, as well as innovations later proposed by the central unit, may be costly in terms of both dollars and manpower if fully implemented. This is good reason for assuring, wherever it is feasible, full consideration be given to the problem of how the effectiveness of the activity can be evaluated, at the time the activity is initiated.

In addition to the above recommendations the Committee suggests that the central office investigate:

- i. The feasibility of launching other efforts similar to the National High Blood Pressure Educational

Program. (Are there other widespread problems which can be attacked by such combined scientist-professional-public campaigns?)

ii. The possibility of giving grants or awarding contracts to NIH supported institutions for the purpose of improving dissemination of the research information which they develop. (On what basis should such funds be made available? a formula grant, based on their current Federal support? what amounts?)

iii. The possibility of making more use of existing NIH contract authority for the development of new products (biologicals, pharmaceuticals and medical devices) under Federally held patents. This mechanism might be used when the innovating organization does not wish to, or is not capable of proceeding with the development of needed products resulting from Federally supported research and in instances where costs discourage their development.

2. The Committee recommends that the Director NIH promote cooperative efforts with other Federal and non-Federal agencies in carrying out the dissemination of research results.

All of the other Agencies of the PHS (ADAMHA, HRA, HSA, FDA and CDC) are conducting communications programs which convey current medical knowledge to scientists, practitioners and members of the public. In one instance (Bureau of Health Education, CDC), an interagency advisory committee of agency heads was recently established by the Assistant Secretary for Health for the purpose of coordinating public health educational activities. The NIH cooperates actively with the Bureau of Health Education which will become a focal point for coordination of efforts with voluntary health agencies and other non-Federal programs for health education. Informal cooperative efforts with other PHS agencies have frequently been employed to meet specific needs, but consideration should be given to a more structured approach within the PHS to dissemination of research information to practicing health professionals, taking advantage of new channels which will be provided through Professional Standards Review Organizations, Area Health Education Centers, and the Bureau of Health Planning and Resources Development.

Other agencies of the Department of Health, Education, and Welfare have direct relationships with the medical community. In each of the Department's regional offices,

the Regional Health Administrators are in close contact with all elements of the health care system, and consideration should be given to closer collaboration with them in communications efforts.

The NIH now cooperates with the Veterans Administration and the Department of Defense in various programs (e.g. National High Blood Pressure Educational Program).

In some states the Department of Agriculture's Agricultural Extension Service engages in public health education in cooperation with academic medical centers.

An important function of the above recommended central unit for dissemination should be to foster programs in cooperation with other agencies which have well established channels of communication with our various target audiences.

The unit should make special effort to obtain information on the successful communication efforts tested and demonstrated by the more than 50 Regional Medical Programs.

3. The Committee recommends that NIH initiate pilot studies to test the feasibility of establishing regional information centers to promote comprehensive telephonic consultative service for practicing health professionals,

based on existing academic health centers and  
networks of NIH supported categorical disease centers.

The Committee was impressed by the practicality and usefulness of some of the various systems now in operation which make it possible for practicing health professionals to quickly secure current scientific information and discuss their immediate patient problems by telephone with specialists in academic and research centers. Some of these systems are limited to specific categories of disease, a few are comprehensive. Some offer brief taped informational discussions on a wide range of topics, and others offer opportunity for direct professional-to-professional discussions regarding specific patients.

A successful comprehensive program is operated by the University of Alabama Medical Center at Birmingham. A telephone network (statewide incoming and outgoing wide area telephone service) makes it possible for Alabama physicians, dentists, nurses, hospital administrators, optometrists and other health professionals to have quick toll free access to members of the large panel of specialists at the medical center. The service was initiated in 1969 by the Alabama Regional Medical Program. Its value to the

Alabama Professional community is evidenced by its tenfold increase in use from an average of 46 incoming calls per week in 1969-70 to a weekly rate of 459 in 1973-74.

Of the some 2,000 Alabama physicians outside the Birmingham area, 1,500 are users of the service and many are in counties having few physicians.

The service is enthusiastically supported by the senior faculty members (Department and Division Heads, full Professors) of the medical center who accept a majority of the incoming calls. When it appeared that Regional Medical Program support would no longer be available for the service, the Alabama Legislature appropriated funds for its core support. The annual total cost is in excess of \$100,000.

The Committee believes that studies should be undertaken to test the feasibility and effectiveness of the "Alabama system" in other localities.

The NIH is now supporting a limited number of specialized telephonic consultation services as parts of its categorical disease centers, and plans to increase such activity.

The National Cancer Program is in the process of establishing communications systems as adjuncts to its 17

comprehensive cancer centers and in most instances their plans call for telephone consultation networks.

A number of specialized diagnostic centers also engage in information as well as service activities. A good example is the Viral Diagnostic Service at Georgetown University Medical Center, supported jointly by the University and the National Cancer Institute. The service has developed an integrated system of services for meeting the needs of health care providers and research organizations in the mid-Atlantic Region. These services include laboratory testing for viral agents, medical consultation, test development, training, dissemination of information about research results and a range of support services. As of the end of 1974 over 20 institutions in the region were regular users of the service along with a number of physicians in specialist and general practice. The information dissemination and consultation services have been particularly useful for physicians in general practice.

The Committee emphasizes the importance of exploring the possibility of expanding telephone consultation services. They offer a simple, direct channel for communicating new specialized knowledge to the practitioner at the time he can make use of it in the treatment of a patient.

It may be found that the practitioner would prefer a comprehensive consultation service rather than an array of specialized networks. Pilot studies should be undertaken on the practicality of linking together, on a regional basis, the various categorical centers now supported by the NIH, for the purpose of providing quick, simple access to the widest possible range of current medical knowledge.

The Committee is aware that other agencies of the PHS have had successful experience in the use of communications for health professional education and in the delivery of service. A notable example is the Washington, Alaska, Montana and Idaho (WAMI) program, initiated with the support of the Health Resources Administration. WAMI combines programs for professional education, continuing education of professionals and the delivery of health services over a very large area.

It should be determined which agency of the PHS is the most appropriate and best qualified instrumentality for taking the lead in fostering pilot studies in the different areas discussed herein. The NIH should actively promote interagency consultation and early implementation of the studies.

4. The Committee recommends that NIH prepare and publish in media widely used by physicians and other health professionals a brief monthly review of advances in medical knowledge selected on the basis of their current clinical significance.

The principal target audience for the monthly reviews of advances in medical knowledge should be the practicing physician. For this reason the subject matter should be confined to topics immediately relevant to medical practice. The reviews should be brief, readable and candid and include a concise summary of the state of knowledge in the subject field. Footnote references should be used to identify source materials and extended reports for readers wishing to pursue the subject in depth. The Committee recommends that the choice of subjects and approval of the content of the reviews be made a principal responsibility of the committee of scientists described in Recommendation 1A.

After careful consideration the Committee on Dissemination of Research Results concluded that at this time NIH efforts should be concentrated on better use of existing information channels. The publication of a new journal was proposed and rejected because we believe the busy practitioner can be reached more efficiently and effectively

through media on which he normally relies. For the same reason it was decided not to recommend an NIH Newsletter to physicians.

The ad hoc committee has ascertained that the Journal of the American Medical Association would be interested in publishing the reviews on a regular monthly basis, and the Committee recommends that arrangements be made for such publication. Contacts have also been made with producers of informational audio cassette systems which are widely used by physicians as sources of current medical information. We are confident that arrangements can be made for the substance of the monthly reviews to be included in various cassette services, and so recommend.

The NLM's Regional Medical Library Network can serve as additional distribution centers both for the monthly reviews and the source materials on which they are based.

Reprints of the reviews should be provided regularly to all academic medical centers, Area Health Education Centers, Professional Standards Review Organizations, county and state medical societies and to other professional groups.

When the subject matter of the review is appropriate to an individual specialty journal it should be elaborated and offered for publication.

One of the additional advantages of the monthly review plan lies in the fact that it will impose on a specific arm of the NIH responsibility for regular and systematic preparation of current research information in readily usable form.

5. The Committee recommends that NIH take all necessary steps to utilize fully new communications technology including the Communications Technology Satellite.

In addition to its extensive activities in developing and maintaining systems for the storage and retrieval of biomedical information, the NLM is engaged in developing new and improved uses of technology for scientist-to-practitioner communication.

It is an important resource to public and private agencies seeking means to improve the process of continuing education for health professionals. The committee recommends increased attention to the development by the NLM of new uses of technology for communicating medical knowledge.

The committee calls special attention to the plans now being made by NLM's Lister Hill National Center for Biomedical Communications for participation in experiments to be conducted on the use of the Communications Technology Satellite.

The satellite will provide a relatively inexpensive means for holding two-way color television conferences between widely separated points in the United States. It also makes it possible for televised demonstrations, seminars and conferences to be broadcast from the NIH to academic health centers, hospitals and professional groups nationwide.

Although the same kind of communication could be carried on through cables and existing TV relay systems the cost of comparable leased facilities would be astronomical. Simply by installing receiving equipment (estimated at \$20,000) almost any medical center or hospital in the continental United States would be able to receive regular televised presentations via the satellite from clinical conferences, demonstrations, and staff seminars, originated at NIH or at other centers of biomedical research.

The Communications Technology Satellite is a joint U.S.-Canadian project, to be available for use in September 1976. Its transmitters are more powerful than those carried on previous experimental satellites and it will be positioned so as to be capable of serving practically all of the continental U.S. Because of its power the cost of ground

receiving equipment is relatively modest. Nine hours per week have been reserved on CTS for exclusive use by health related programs at no cost to them. The NIH has made a tentative request for two hours per week.

The CTS is designed to have an active life of two years, though experience with similar units predicts a longer active period. The effectiveness of the uses of CTS will be carefully evaluated as plans are made for future systems.

The committee strongly recommends that the NIH make full use of this unique opportunity, and that the central office for dissemination, with the assistance of its committee of scientists and advisors give special attention to scheduling its use by the NIH.

6. The Committee recommends that the NIH increase support to the National Library of Medicine to expand the National Biomedical Communications network it is developing.

The mission of the NLM encompasses many of the activities related to the dissemination of research information.

One unit of NLM, the Lister Hill National Center for Biomedical Communications was established to provide

assistance to health care professionals with problems in biomedical communication, especially those problems amenable to possible solution by the application of computer and communications technologies. The Center has many contacts with the medical community.

Another component of the NLM is the National Medical Audiovisual Center (NMAC) which provides a national focus for the best use of nonprint informational materials by the entire community of health professionals. NMAC is skilled in technical development, evaluation, production and distribution of audiovisual materials needed by those whose primary concern is with the training of health professionals.

The committee recommends that serious consideration be given to increasing the support of the Lister Hill National Center for Biomedical Communications and the National Medical Audiovisual Center as means for improving the dissemination of information produced through biomedical research.

7. The Committee recommends that the NIH increase the output of health education information for use by the mass media, especially audiovisual and videotape materials for

dissemination through radio and television including cable TV and closed circuit television.

From time to time the NIH has conducted "State of the Art" briefings for science writers representing the nation's largest newspapers, magazines and the electronic media. These briefings have been the source of many articles carried by the mass media and have been an effective means for communicating information on the process of research and advances in knowledge to the public. The committee recommends that a regular schedule, at least six per year, of such "State of the Art" briefings be established and maintained.

NIH's regular programs of direct public health education through the electronic media have been confined largely to the use of public service announcements for radio. Discs containing 20 recorded announcements are sent quarterly to 1,200 radio stations. In addition "live copy" is mailed to 1,000 stations.

The content of these announcements has dealt primarily with promotion of printed leaflets prepared by the various Institutes on common health problems.

The committee recommends that a larger proportion of the

material prepared for radio be substantive, i.e. that it convey more health information of immediate use to the listeners.

It is further recommended that new discs, tapes, and copy be provided to radio stations more frequently, because we believe that "fresher" material is more likely to be used.

Through coordination with the permanent office on dissemination, tape recordings can be prepared for television and radio use on the subjects covered in the monthly reviews.

Public service announcements for television use should be produced on a regular schedule. When resources permit at least one per month should be produced on tape or film and be made available to all television stations.

The list of subjects to be covered in radio and television public service announcements should be coordinated with the permanent office for dissemination. Special attention should be given to coordinating such material with the information programs of the appropriate voluntary health agencies.

Consideration should be given to the production of a limited series of 30 minute films for public service use by commercial and educational television stations. The films should be devoted (perhaps singly) to significant disease

problems and convey to the public useful information based on advances in knowledge. One such NIH film "To Seek To Teach To Heal" produced in 1970 has been widely used by the electronic media (918 showings on television stations) and by clubs, schools and church groups (11,000 showings).

8. The Committee recommends that the NIH conduct a series of national workshops to review existing means of disseminating research information, identifying needed improvements, and suggesting steps for implementation.

As part of its effort to develop and maintain systems for effective communication, the permanent office for dissemination, through the NLM should, within the calendar year, conduct workshops involving leaders from the biomedical research community including industry, the academic community, the health professional community as well as communication experts. The purpose of the workshops would be to define informational needs and to devise improved means for meeting them.

The committee recommends that plans for such a workshop on public health education be explored with the Bureau of Health Education, CDC, as a joint activity with NIH, to better define the most effective role of NIH in this sphere.

Representatives of consumer organizations, voluntary health organizations, the public media and the general public should participate along with research scientists and agency officials.

IV. SUMMARY OF COMMUNICATIONS ACTIVITIES CURRENTLY  
CONDUCTED BY NIH

Communications with the Public

In addition to its many activities in the field of scientific communications, NIH conducts a substantial program of information for the public and the professions. In carrying out this responsibility, it utilizes all the media of communication. News about new or significant programs and research developments is regularly conveyed to the public via news releases, press briefings and conferences, and interviews and personal appearances.

In addition, NIH initiates the following special services for the media on a regular basis:

"News and Features from NIH" - a bi-weekly service provided by request to 103 metropolitan daily newspapers, 40 lay periodicals, 80 professional journals, 35 news syndicates, and approximately 150 science and other news writers. This news and photo service is based on research information provided by all Institutes, their grantees and contractors.

"NIH Search for Health" - a weekly column for small daily and weekly newspapers, distributed on request to

approximately 500 such media. The column is designed to interpret for the public the state of knowledge in a wide variety of health fields and to report advances. This service has been provided weekly for almost ten years.

Public Service Radio Announcements - Kits of discs or live copy containing 80 health related announcements are produced by NIH each year and provided by request to over 2,000 radio stations throughout the United States and Puerto Rico.

Tips from NIH - Interviews with NIH scientists ranging from two to ten minutes in length are provided, on tape, to requesting radio stations. This is a new service and in its initial year approximately 100 stations used each bi-monthly issuance.

Television Public Service Announcements - Six slide or film announcements per year are provided to nearly 700 television stations, and in addition special films are provided for network "feeds" and to local stations.

NIH Film "To Seek To Teach To Heal" - A 30 minute film produced in 1970 continues to be a useful means of reporting the significance of biomedical research to the public. It has been shown 712 times on commercial television stations, 206 on educational television stations and 672

times on cable television. In addition the film has been shown to club, school and church groups 11,000 times. It is significant that the number of television showings over commercial outlets has been almost exactly the same for the past three years.

Special Public Multi-media Programs - The National High Blood Pressure Educational Program has received national attention both for the value of its content and its effectiveness as a communication effort. A summary of statistical information on this program is attached as Appendix 4.

Research Advances - The NIH has initiated a new publication activity specifically intended to make its research accomplishments in selected fields known to a broad segment of the scientific, professional and general public.

Each year, it is planned, a "Research Advances" volume will be published giving concise but specific accounts of important findings from research conducted and supported by the several bureaus, institutes and divisions. Each volume will be illustrated and will have an attractive format, utilizing limited color printing. The first of these annual reviews will be issued in April 1975.

One purpose of the volume will be to enlist the interest

of medical students in careers in biomedical research. Accordingly, the volume will be distributed to each senior medical school student in the country, as well as to all principal investigators and contractors supported by NIH extramural and collaborative projects and others. Total distribution will be approximately 50,000 each year.

#### Response to Public Inquiries

The NIH received over 830,000 direct inquiries from the public during fiscal 1974. About 85 percent of such were written requests for information on health problems. Leaflets and fact sheets covering a wide variety of disease problems are used in meeting this public demand.

#### Communication with Practicing Health Professionals

Publications - The NIH distributed 172 different publications to physicians during fiscal 1974 for their use in practice. One hundred thirty-five different special publications were distributed to physicians to be given by them to patients in the course of treatment or consultation. A total of 786,000 copies of the above publications were provided directly from NIH.

Inquiries - The NIH received over 83,000 direct

inquiries from physicians during fiscal 1974 by mail and telephone, and provided in addition almost 60,000 consultations with physicians or patients.

Seminars and Other Meetings - During fiscal 1974 the NIH sponsored 96 seminars for practicing physicians for the purpose of conveying and discussing the state of knowledge and advancements in medical knowledge. Over 10,000 physicians attended such NIH sponsored seminars or presentations.

Special centers are supported by the NIH in virtually every academic medical center and in many hospital centers. Over 200 such units serve as information centers for practicing physicians, providing them access to advances in medical knowledge for immediate use in the care and treatment of their patients.

#### Scope of Information Activities

The wide scope of informational activities carried out by constituent units of the NIH is illustrated by exhibit 5 - "Informational Activities and Services of the National Cancer Institute." While the NCI programs in some areas are more extensively developed than those of other Institutes, the pattern and range of activities reported is representative of all NIH research components.

MEMBERSHIP OF NIH COMMITTEE ON DISSEMINATION OF RESEARCH

RESULTS

Chairman: Mr. Storm Whaley, Associate Director for  
Communications, NIH

Dr. Robert M. Bird, Director, Lister Hill National Center  
for Biomedical Communications, NLM

Dr. Philip Chen, Assistant Director for Intramural Research

Mr. Melvin Day, Deputy Director, National Library of  
Medicine

Dr. Carl Douglass, Deputy Director, Division of Research  
Grants

Mrs. Ruth Dudley, Research Reports Officer, National  
Institute of Neurological Diseases and Stroke

Dr. Diane Fink, Director, Division of Cancer Control and  
Rehabilitation

Dr. Ruth Kirschstein, Director, National Institute of General  
Medical Sciences

Dr. Milo D. Leavitt, Director, Fogarty International Center

Mr. George Payne, Special Assistant to the Deputy Director, NIH

Dr. Solomon Schneyer, Director, Division of Program Analysis,  
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