"A NARRATIVE DESCRIPTION INCLUDING AN ARCHITECTURAL PROGRAM WITH SPACE SCHEDULES"

UNIVERSITY OF MINNESOTA MEDICAL SCHOOL

MINNEAPOLIS, MINNESOTA 55455

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ABSTRACT

Three major considerations prompted the faculty of the Medical School to plan conjointly with the other Health Sciences Disciplines for the development and expansion of the Health Sciences Center.

1. The need for an increased number of health care personnel, including physicians, has been amply documented by intramural reviews and independent studies. An increased Medical School class has been recommended by a Public Advisory Commission on the basis of a study performed under the auspices of the Louis W. and Maud Hill Family Foundation of Saint Paul. Adequate, expanded facilities are needed to teach an augmented number of medical students and house the faculty attendant upon the increase in class size.

2. The need to provide a development and expansion of facilities appropriate to a newly developed curriculum, with its special requirements for versatile laboratories, classrooms, and teaching aids, has become evident.

3. Already over-crowded basic science and clinical facilities, barely adequate to provide instruction facilities for the current size Medical School enrollment, reinforce the need for expansion.

The Health Sciences Development Program is divided into two large phases. Phase I., which is directly related to the proposed class size increment of 40 for the Medical School, is scheduled for three steps.

Step 1, the specific subject of this current project and application, consists of expanded facilities for the Medical School, the School of Public Health, and the School of Dentistry, and expanded, modern shared classroom areas. Specific facilities for the Medical School included in this project are teaching laboratories and their support areas for the Departments of Biochemistry, Pharmacology, Physiology, Pathology, and Microbiology and offices and laboratories for the Departments of Medicine and Pediatrics.

Steps 2 and 3, which will be the subject of later applications, consist of an outpatient unit, a clinical department laboratory area, renovation and expansion of current basic science and clinical departmental areas, expansion of University Hospitals bed facilities and renovation of current clinical units, and expanded, renovated facilities for the School of Nursing. Also included are a service unit, a Radiation Therapy unit, and a unit for the School of Pharmacy.

It is estimated that the total cost of Phase I will approach $95 million. The subject of this current proposal is estimated at $40 million, of which about $28 million are construction costs. Approximately $5.8 million will be the Medical School's portion of the costs.

Upon completion of the current project, scheduled for 1973, the incoming Medical School class will be increased from 163 to 203 students. Future facilities expansion, beyond the current project, but included in the total program, will allow completion of facilities in time to meet the needs of the augmented classes when they reach the more clinically oriented portions of the curriculum. The current project will provide new and expanded, efficient classroom teaching areas; new versatile Basic Science teaching laboratories, adequate to accommodate increased numbers of students and effectively implement the new curriculum including a program in Family Practice and Community Health, which begins in September, 1969; and the initial expansion of several clinical departments, the final expansion of which will take place in Steps 2 and 3.

Part I A Background

HISTORY OF THE MEDICAL SCHOOL

The first classes in Medicine at the University of Minnesota began in 1888, when three private Medical Schools in Minneapolis and St. Paul surrendered their charters to the University of Minnesota for the purpose of establishing a Medical School. At that time the Department of Medicine included the College of Medicine and Surgery, the College of Dentistry, and the College of Homeopathic Medicine and Surgery. In 1892, the Department of Medicine was reorganized, providing for three separate colleges and the addition of the newly established College of Pharmacy.

Further reorganization resulted in the formation of the College of Medical Sciences, which currently includes the Medical School, the School of Nursing, the School of Public Health, and University Hospitals, the first unit of the University Hospitals having been dedicated in 1911.

Expansion resulted in the progressive increase in the size of the Medical School classes and the emergence of the School as a major teaching and research center. In 1963, the administrative committee of the Medical School recommended an increase in the class size, then at 150 students, contingent from adequate facilities and staff, in order to meet the emerging needs for health manpower in the state and in the nation.

In 1964, the Board of Regents of the University of Minnesota considered the growing need of Minnesota for health manpower required by the state's growing population and the manner in which this need would affect the role of the University in providing physicians and other health care personnel. The Regents requested the Louis W. and Maud Hill Family Foundation of St. Paul to investigate these health needs of the State. In June of 1966, the Hill Family Foundation published a report, "Health Manpower for the Upper Midwest," which documented the need for training additional health personnel for Minnesota. The Public Advisory Commission appointed by the Hill Family Foundation to aid in conducting the survey and reaching its conclusions recommended that the University of Minnesota expand its entering medical class to 200 students at an early date and plan for a further expansion to 250 students at sometime in the future: that the University encourage additional students from the 2 year medical school of North and South Dakota to complete their training at the University of Minnesota: and that the University strengthen the teaching of skills and attitudes relative to the responsibilities of the personal or family doctor so that the institution's position as a major provider of personal physicians for the upper Midwest would not be lost.

In 1966, extensive faculty planning for physical expansion of the University Medical School began.

In 1966, the Medical School faculty adopted a new constitution and bylaws. This constitution was last revised on November 7, 1968.

The newly formed department of Family Practice and Community Health was approved by the faculty in 1968. That same year, the faculty of the Medical School, after extensive planning, adopted a new curriculum which is to be implemented in September, 1969.

Part I A Background

JUSTIFICATION AND NEED

Although the State of Minnesota currently enjoys a physician to population ratio near the National average, when factors such as the high density of physicians at the Mayo Clinic at Rochester and at the University of Minnesota Health Sciences Center are considered, the ratio is less favorable. In addition, there is a maldistribution of physicians between rural and urban areas. Furthermore, the University of Minnesota Medical School is the only 4 year school serving a four state area of the upper Midwest. The anticipated population growth of the State and the upper Midwest area, associated with the ever-increasing demands of the people of the area for better, more extensive health care, have posed a challenge to the University of Minnesota Medical School to provide increasing numbers of graduate physicians.

In 1963, the faculty of the Medical School early recognized the impending crisis in Health manpower requirements and recommended a major increase in the size of the Medical School class. Earlier adjustments in class size resulted in an increase to 140 from 125 in the late 1950's, an increase to 150 in 1960 and, finally, an increase to 160 in 1964.

In 1964, the Regents of the University requested a study to investigate the health needs of the people of the State and the Upper Midwest, performed under the auspices of the Louis W. and Maud Hill Family Foundation. This resulted in the study, Health Manpower for the Upper Midwest, published in 1966. This thorough and extensive document provided a basis for a recommendation by a Citizens Advisory Commission that the School of Medicine increase its class size to, at least, 200 and establish a curriculum to train increased numbers of personal, or family, physicians.

> "Although there is no generally accepted way of estimating the number of physicians needed, the requests for doctors made by many communities to official and other agencies spoke for a substantial unsatisfied demand. It was clear that the current ratio of physicians to population should at least, be maintained.
>
> By estimating the number of physicians who will be lost to Minnesota in the next ten years through death, retirement, or outmigration, and by balancing this figure against the estimated additions to the profession and against the expected population of Minnesota in 1975, the Health Manpower Study estimated that there would be between 200-300 fewer physicians than would be needed to maintain the present ratio of active physicians to population.
>
> Estimates can only serve as rough measures. When we turn to trends in the supply of physicians, we are on firmer ground. The long-term decline in the doctor: population ratio of active and of personal physicians went far toward explaining the insistent feeling that there is already a shortage. As the medical profession differentiates increasingly into specialty practices--some of which do not involve direct patient care--an increased number of physicians will be required merely to meet present demands and needs.

A greatly increased demand for medical care must be anticipated because of Medicare, rapid growth of personal income, improvements in health insurance and population growth. To accommodate this increased demand, there should be some betterment of the present ratio.

The evidence relating to population growth is impressive. Between 1960 and 1975 the state will have gained population equal to the 1960 combined population of Minneapolis, Rochester, Mankato and Austin. The demand for medical care from this expanding population must be taken into consideration.

Since an increase in the size of the University of Minnesota Medical School's entering class of 1967 will not be fully reflected in practice until about eight years later, the anticipated shortage will not begin to be met by more graduates until 1972, at the earliest, or by 1975 when most of the 1967 entrants will complete their hospital training. More than token expansion of the class entering in 1967 may not be possible. By 1975 Minnesota will have to be planning to meet the needs of further population growth.

Any dependence on recruitment of physicians from other states is hazardous. While there is no doubt that physicians trained out-of-state will continue to settle in Minnesota, the factors which cause Minnesota graduates to go to other states will also act on these physicians. Tabulation by the Study staff shows that the number of physicians who are educated elsewhere and who settle in Minnesota tends to be declining.

Therefore the Health Manpower Study Advisory Commission recommends that the University of Minnesota expand its entering class to 200 students at an early date and lay plans for a further expansion to 250 at some time in the future."*

Increased numbers of physicians, trained at the University of Minnesota to coordinate their activities with other health professions personnel, will help to maintain and increase effective physician services to the people of the area. Increased numbers of physicians, educated in a curriculum which prepares them for contemporary practice and which includes a strong Department of Family Practice and Community Health will help insure not only an adequate number of prepared physicians but also an improvement in the distribution of physicians throughout the area.

*Health Manpower For The Upper Midwest, Peterson, O.L., Executive Director and Fahs, I.J., Director of Field Studies. Louis W. and Maud Hill Family Foundation, Saint Paul, Minnesota, 1966. p.95.

Part I A Background

FACILITIES AND THEIR DEFICIENCIES

The Basic Science Departments of the Medical School are housed in Jackson Hall (1911), Millard Hall (1911), Lyons Laboratories (1951), and the Owre-Jackson addition (1958). Although the Lyons Laboratories and the Owre-Jackson addition are of fairly recent vintage, the majority of the space for the Basic Science Departments is located in the Jackson Hall and Millard Hall which are over fifty years old. These facilities have served there purpose well but for some years have been outmoded and over-crowded. Although many of the facilities were remodeled in the late 1950's the experiences during, and since, the renovation have emphasized the basic inadequacies of the Physical Plant. Mechanical and electrical services are basically inadequate. Student and faculty movement throughout the facilities are inefficient and elevator service is minimal. Except in few instances, student laboratories are crowded beyond capacity. They tend to be ineffective and do not lend themselves to new and more acceptable teaching methods.

Faculty laboratories are crowded, inefficiently organized, and hardly conducive to increasing research by the faculty. These laboratories are so crowded that even washrooms have been commandeered for use as laboratories. Faculty offices are small, crowded, inefficiently arranged, and generally disreputable. There is a general lack of seminar and classroom space for student and faculty.

In the basic science areas there are no amenities of student life. There are no student lounges or student areas. There is no place where students may effectively congregate and pursue their intellectual endeavors. Larger classrooms and auditoria are outmoded and because of their physical deficiencies are unable to be provided with appropriate audio-visual and electronic teaching aids.

Without expansion and renovation of these facilities, it would be impossible to expand Medical School enrollment or that of the other health science units. Not only would it be impossible to house the students, but there literally would be no space available for the increase of faculty attendant upon the increased enrollment. Under current conditions, in spite of increased faculty endeavors, the quality of instruction has suffered. It would be impossible to improve the quality of instruction by the use of newer teaching techniques and to implement a new curriculum which requires versatility of physical facilities.

The clinical programs and facilities of the School of Medicine are housed in the University Hospitals, which include the Mayo Tower, Todd and Eustis Wings, the Variety Club Heart Hospital, the Masonic Memorial Hospital and the Children's Rehabilitation Center. The latter three units were built in 1949, 1958, and 1962 respectively while the main hospital complex was

developed in stages from 1911 and 1954. Again it should be noted that these facilities serve the inpatient and outpatient programs of not only the medical school but the other health sciences as well.

While it is important to note that the other health sciences are also developing new programs under new staff it is particularly significant that in the School of Medicine the chairmanship in half the clinical departments has changed hands during the last three years. Consequently young, aggressive, medical educators have assumed the leadership roles in these departments bringing along with them faculty who are interested in new and expanding programs. We might site transplantation, chronic dialysis, specialized surgical units, cardiac intensive care, family practice, clinical research centers, and nursing organization and research as some of the programs which are presently making do with inadequate, although sometimes remodeled, facilities. At the same time many of the smaller clinical departments have increased the size of their staffs from one or two men to three or four thus doubling the requirements for teaching patients as well as office and research space.

The inability to accommodate these expanded programs physically is heightened by the difficulty of adapting architecture designed as much as fifty years ago to contemporary needs and potentialities. The present facilities, even when remodeled, do not allow us to take advantage of many forms of electronic communication for transmission of data, records, and information or mechanical transportation systems for better flow of patient records, radiographic film and patient service items. These deficiencies have an inhibiting effect on patient service and education.

There is a serious shortage of seminar areas and classroom facilities. Large classrooms and auditoria are outmoded and unable to accommodate, at any one time, a single, current medical school class. Patient, faculty, and student traffic pathways are inefficient and time wasting.

Clinical faculty and departmental offices, which are located in this complex, are greatly outmoded and seriously over-crowded with the result that it is necessary to house faculty in buildings outside the hospital complex and even off campus.

Student laboratories are small, cramped, and contain few services. There are not enough laboratory facilities to accommodate the number of faculty needed to teach the current medical students, so that faculty laboratories have been developed in old and temporary structures away from the hospital complex and from the campus and away from the clinical activities of the faculty.

The Hospitals Outpatient Department is over-crowded and not conducive to patient acceptance. With the anticipated need for more outpatient services for the people of the state and the area, the total space proves inadequate.

Again, the clinical areas, because of their physical restrictions, are not adequate to provide facilities for an increased size of a Medical School class. The numbers of teaching beds, offices laboratories, and hospital services are so restricted and so aged that it would be impossible to consider an increase in the size of the Medical School class without impairing the quality of instruction.

Part I A Background

EDUCATIONAL PHILOSOPHY OF THE MEDICAL SCHOOL

The objectives of the Medical School are to teach students, at all levels of training and experience, the expanding art and science of Medicine; to foster basic and clinical research; and to provide exemplary models for health care for the people of Minnesota, the Upper Midwest, and the Nation.

Responding to the needs of the student of Medicine to assimilate ever increasing bodies of knowledge and to develop professional attitudes responsive to the needs of society, to the demands of the people of the state of Minnesota and of the Nation for improved health care, and to the changes in the professional structure of American medicine; the faculty adopted a new undergraduate curriculum in 1968. This curriculum stresses goals which ensure a relevant, flexible medical education and which emphasizes the student as a learner of medicine. The curriculum will improve communications among faculty and students, will prepare the Medical student for the future of Medical practice, and will inculcate the humanistic aspects of Medical care. These goals are to be pursued in a setting which encourages interchange with other health science students and personnel leading to an awareness of the health team concept in the provision of health care.

These same goals are applicable to graduate education where, in addition, excellence in the basic sciences and the various clinical specialities, including family practice, is pursued.

Realizing the need for continuing education for the graduate physician, the post-graduate education program has stressed predominantly the short-course method for providing relevant and important information for the practicing specialist and generalist.

Research at the University of Minnesota has focused primarily upon inquiry into basic biological phenomena and applied clinical research. These endeavors have also included investigation into medical education and the social influences upon health education and health care delivery.

The University's concept of service has been expanded by the faculty and students of the Medical School by their example of health care in the community, by their consultation services to the physicians of the State and region, by their provision of health care to the indigent of the State and the Metropolitan area, by their participation in Community-Medical related projects, and by their encouragement of the health care team concept.

THE PLANNING PROCESS

Overall planning for the Health Sciences Development Program was coordinated by the planning office of the University of Minnesota. A committee composed of faculty and administrative representation from the various health sciences, School of Medicine, University Hospitals, School of Dentistry, School of Nursing, and School of Public Health, coordinated the various activites of faculty groups. Medical School planning was accomplished by the Clinical Teaching and Research Committee, which was responsible for the clinical aspects of the program, and the Committee on Basic Sciences, which planned the basic sciences development program. Besides these faculty committees, various faculty subcommittees were responsible for the programmatic and architectural aspects of various portions of the planning, e.g., the Out-patient Committee, the Operating Suite Committee, etc. The overall educational aspects of the Medical School program were considered by the Clinical Teaching and Research and Basic Science Committees with the ratification and the advice of the Educational Policy Committee of the Medical School with set various educational priorities to be satisfied in the Development Program based upon the proposed curriculum.

A major increase in the size of the Medical School classes, contingent upon adequate facilities and staff, was originally recommended by the Administrative Committee of the Medical School in 1963. The Administrative Board of the Medical School concurred in this recommendation in 1968, basing the decision upon the Hill Family Foundation Study contained in the report, "Health Manpower for the Upper Midwest" and materials presented to a special interim subcommittee of the State of Minnesota Senate.

Part I B

MEDICAL - COMMUNITY RELATIONSHIPS

Community - University Health Care Center - The University of Minnesota has served as a subcontractor to the Minneapolis Health Department in providing services under a grant from the Children's Bureau of the Department of Health, Education and Welfare. The Community - University Health Care Center (CUHCC) serves a population outlined by three elementary school districts in a minority group, underprivileged area of the Numbers of University staff and students have participated in the Center program of investigating the best way to deliver health care to such a population. Disciplines represented have included Medicine, Dentistry, Psychology, Nursing, Nutrition, Social Work, Audiology, Health Education, and Health Administration. It is hoped that this project may be ongoing and self supporting after the conclusion of the grant which initiated it.

The University of Minnesota School of Public Health is the grantee agency for evaluating the Children and Youth Projects all over the country of the type described for CUHCC.

Pilot City Project - The University is providing through its close affiliate, Hennepin County General Hospital, medical staff for the Pilot City Clinic recently opened in another minority, underprivileged area of the city. The University involvement is more indirect in this case, but there is potential for further interdisciplinary participation in this potentially important project.

Comprehensive Health Planning - The Dean of the College of Medical Sciences, Faculty of the School of Public Health and the Dean of the College of Pharmacy serve on the governor's Council on Health, Rehabilitation and Welfare which serves as the comprehensive health planning advisory council for the State of Minnesota.

Within the local community the University, and particularly the Hospitals, have cooperated with the comprehensive health planning agency as they made their study leading to the recommendation that comprehensive health planning be assigned to the Metropolitan Council.

Twin City Hospital Planning Agency - As mentioned in the general statement, the University Hospitals has submitted the hospitals portion of the development program for review by the local hospitals planning agencies. The agency has not only approved the project but written a report supporting and recommending its implementation.

Beyond the Hospitals association with the planning agencies related to its own project, the staff of the Hospitals has been an important supportor of the planing concept in the Twin Cities. The Director of the Hospitals and other members of his staff have devoted generous amounts of time to assisting the joint staff of the two hospital planning boards with their work in reviewing hospital requests, a role definitions of the planning body itself, establishing its position relative to comprehensive health planning, and recommending the merger of

the two hospitals planning agency boards into one metorpolitan area council.

Regional Medical Program - The University has been a participant in the regional program which has received operational funds. Membership in the program is composed of nine state-wide health agencies, including the University, which have become incorporated into the Northlands Regional Medical Program, Incorporated.

The Medical School staff and administration has been actively engaged in the development and utilization of this resource. Several programs of the Medical School have received operational grants.

Part I C

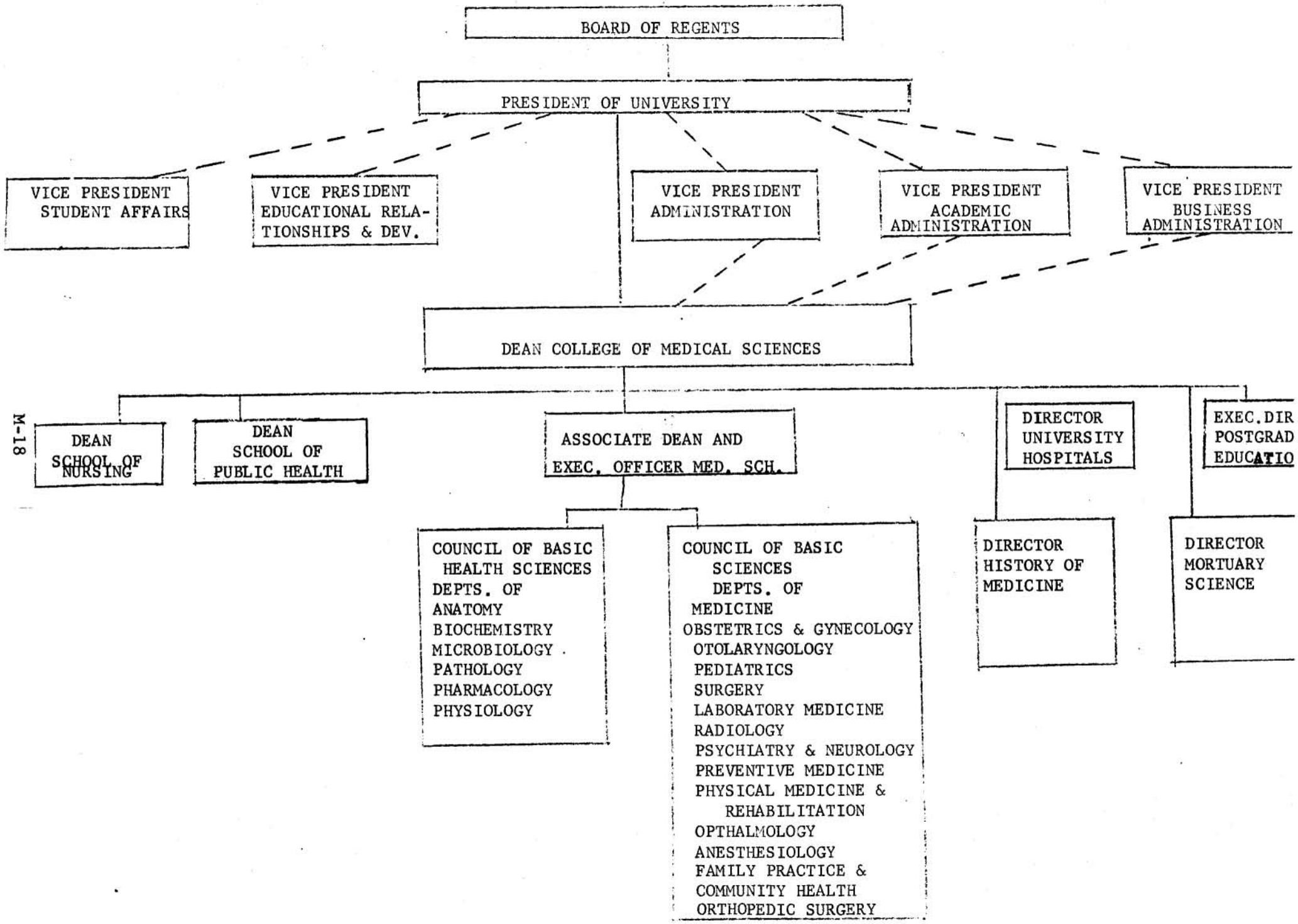
MEDICAL SCHOOL ORGANIZATION

The Medical School is a unit of the College of Medical Sciences which contains, in addition, three other major elements, the School of Public Health, the School of Nursing, and the University Hospitals. The Dean of the College serves the function of the Dean of the Medical School. Direct administration of Medical School affairs is under the jurisdiction of an Executive Officer, the Associate Dean of the Medical School and his staff of 2 Assistant Deans, who report directly to the Dean.

An Associate Dean of the College is responsible for extramural and community responsibilities of the College including affilliated hospital liaison. An Assistant Dean of the College is primarily responsible for physical facility development and planning.

The Health Sciences Schools, including the four major elements of the College of Medical Sciences, and the School of Dentistry, the School of Pharmacy, and the School of Veterinary Medicine are loosely affiliated in a Health Sciences Council of Deans and Directors. The conjoint planning of the current project is an example of the interdisciplinary liaison which has characterized this Council.

The following chart demonstrates the internal organization of the school and its relationship to other components of the College of Medical Sciences and the University.


BOARD OF REGENTS
PRESIDENT OF UNIVERSITY
VICE PRESIDENT STUDENT AFFAIRS
VICE PRESIDENT EDUCATIONAL RELATIONSHIPS & DEV.
VICE PRESIDENT ADMINISTRATION
VICE PRESIDENT ACADEMIC ADMINISTRATION
VICE PRESIDENT BUSINESS ADMINISTRATION
DEAN COLLEGE OF MEDICAL SCIENCES
DEAN SCHOOL OF NURSING
DEAN SCHOOL OF PUBLIC HEALTH
ASSOCIATE DEAN AND EXEC. OFFICER MED. SCH.
DIRECTOR UNIVERSITY HOSPITALS
EXEC. DIR POSTGRAD EDUCATIO
COUNCIL OF BASIC HEALTH SCIENCES
DEPTS. OF
ANATOMY
BIOCHEMISTRY
MICROBIOLOGY
PATHOLOGY
PHARMACOLOGY
PHYSIOLOGY
COUNCIL OF BASIC SCIENCES
DEPTS. OF
MEDICINE
OBSTETRICS & GYNECOLOGY
OTOLARYNGOLOGY
PEDIATRICS
SURGERY
LABORATORY MEDICINE
RADIOLOGY
PSYCHIATRY & NEUROLOGY
PREVENTIVE MEDICINE
PHYSICAL MEDICINE & REHABILITATION
OPTHALMOLOGY
ANESTHESIOLOGY
FAMILY PRACTICE & COMMUNITY HEALTH
ORTHOPEDIC SURGERY
DIRECTOR HISTORY OF MEDICINE
DIRECTOR MORTUARY SCIENCE

MEDICAL SCHOOL COMMITTEES

Administrative Board of the Medical School

It shall be responsible for overseeing the administration of the policies of the Executive Faculty relating to educational matters and shall be advisory to the Dean with respect to budgetary and other aspects of the administration of the Medical School. In particular, the Dean will discuss with the Administrative Board all aspects of the preparation of the annual budget, including policies governing the allocation of funds for salary increases and general policies concerning the allocation and expenditure of the various resources of the Medical School not designated for specific purposes.

Faculty Advisory Council of the Medical School

In recognition of the need of the Dean for a small, responsible group of advisors who can meet with him frequently, regularly, and on short notice when necessary, there shall be a Faculty Advisory Council that shall include members elected by the Executive Faculty. On policy matters the Faculty Advisory Council shall, through the Dean, make recommendations to the Administrative Board and/or the Executive Faculty, as may be appropriate. It shall take definitive action only with respect to such matters for which responsibility has been delegated to it by the Administrative Board or Executive Faculty. Such delegated responsibilities shall be defined in the Bylaws.

Committee on Committees of the Medical School

The Committee on Committees shall review the scope of the various standing Committees of the Executive Faculty. It shall, after consultation with the Dean, recommend for the consideration of the Executive Faculty at the October meeting each year a slate of candidates for election to each of the various other standing committees of the Executive Faculty. The Committee on Committees shall make a report concerning its activities to the Executive Faculty at least once each year.

Educational Policy Committee of the Medical School

The Committee on Educational Policy shall be responsible for continuing review and evaluation of the undergraduate and graduate educational programs of the Medical School and for making appropriate recommendations to the Executive Faculty for additions to or modifications of the educational programs of the Medical School. It shall make a report concerning its activities to the Executive Faculty at least once each year. Recommendations reported to the Executive Faculty for action shall be subject to prior consideration by the Administrative Board as described in Section D of the Bylaws of the Medical School.

dical School Admissions Committee

The Medical School Admissions Committee shall be responsible for the selection each year of the students who will carry out studies toward the degree Doctor of Medicine.

Faculty Academic Promotions Committee of the Medical School

Review of recommendations for faculty promotion made by the various Medical School Departments to the Dean's office; notification to the Dean of the Medical School of the Committee's recommendation concerning each proposed promotion; general advice to the Dean of the Medical School concerning policies and procedures for Medical School faculty academic promotions, in accord with the Academic Promotion Policy of the College of Medical Sciences adopted by the General Faculty of the College on November 7, 1968. (The Medical School Committee elects a Chairman each year from among its members; Dr. James Dawson was elected Chairman for 1969).

Committee on Student Scholastic Standing of the Medical School

This Committee will consider the cases of students doing unsatisfactory Medical School work at the end of each academic quarter and recommend appropriate disposition of each case. Acting for the Executive Faculty, it shall be responsible for recommending to the Dean those students eligible for advancement and those students eligible for graduation with the degree Doctor of Medicine. Policy matters not satisfactorily resolved by the usual procedures of the Committee will be referred for final determination to the Executive Faculty as a whole, which shall hold a special meeting for this purpose at the request of the Committee. In any event, the Committee on Student Scholastic Standing will report on its activities to the Executive Faculty at least once each year.

Anatomical Committee

Administration of law of State of Minnesota - as it relates to procurement and use of bodies for dissection.

Internship Advisory Committee for the Medical School

Development of policies concerning advising medical students concerning selection of internships; implementation of such policies.

Ad hoc Committee to Consider Special Programs in Medical Education Programs for Disadvantaged Students

Study of the present and future roles of the Medical School in education of students from disadvantaged minority groups, especially Negroes and Indians, in accordance with action of the Exectutive Faculty on October 15, 1968; proposal of possible special programs in this area to be presented in Spring 1969 to the Executive Faculty of the Medical School as well as other appropriate Medical School bodies.

SERVICES FROM OTHER ACADEMIC UNITS

The University of Minnesota Medical School is fortunate in its location in a large academic community to be able to obtain services from other University components or academic institutions.

The University Hospitals provide the clinical laboratories for the education of the medical student. This major component of the College of Medical Sciences is devoted primarily to the education of the Health Sciences students and provides a milieu in which excellent health care may be learned. Its many programs and services, administrators and staff, contribute greatly to the educational endeavors of the Medical School.

The School of Public Health provides instruction to the Medical School student on the principles and practices of Public Health. The relationship between the Medical School and the School of Public Health is strengthened by the Medical School's department of Public Health which consists of faculty from the School of Public Health. The Division of Biometry of the School of Public Health work closely with the departments of the Medical School in the development of various types of statistical data. In addition, faculty from the School of Public Health are working closely with several medical school departments, especially the Department of Family Practice and Community Health, in the development of viable methods for health care delivery in this region.

Faculty of the School of Dentistry contribute to the instruction of medical students in the basic science disciplines and participate in the instruction of the maxillo-facial disorders and certain aspects of cancer and genetics.

The Audio-Visual Department of the University participates in the development of electronic aids in the instruction of Medical Students.

A Physical Plants department of the University plays a predominant role in the maintenance, renovation, and construction of the physical facilities of the School. Staff from the academic areas of engineering and biophysics and the College of Biological Sciences contribute to the teaching and research endeavors of the Medical School faculty.

The faculty and staff of the Medical School will continue to use the computer services of the University main computer center, not only for data processing, but also for computer assisted instruction.

Paramedical students, including occupational therapy students, physical therapy students, medical technology students, and radiology technology students gain their general education through the College of Liberal Arts of the University of Minnesota.

Planned cultural programs for students and faculty continue to enlist the faculty from a number of academic units on the campus, including the history, politics, music, art, philosophy, and education areas.

Services including housing and eating, recreational, sports, and cultural facilities are provided for the Medical Student by the University.

The central administration of the University plays a supportive role in the administration of the Medical School by providing assistance in fiscal and personnel matters.

Part I C Organization

SERVICES RENDERED TO OTHER UNIVERSITY COMPONENTS AND INSTITUTIONS

A significant portion of the activities of the faculty of the Basic Science Departments is the instruction of health science students other than medical students. Instruction in the basic medical sciences is offered to dentistry students, pharmacy students, nursing students, occupational therapy, physical therapy, and medical technology students, mortuary science students, and certain students in the College of Liberal Arts.

The audiology section of the Department of Otolaryngology participates in the education of speech therapy students.

The Department of Psychiatry and the Division of Clinical Psychology combines its education facilities and staff with the Psychology department of the College of Liberal Arts.

Faculty of the Medical School participates strongly in the affairs of the University through membership of the Faculty-Student Senate and several key committees of that group. The administration of the Human Volunteers Review Committee of the University falls within the Medical School. Many Medical School faculty participate in this campus-wide activity.

There is a widespread participation by the student and the faculty of the Medical School in the various community health projects. These are described in a earlier section.

Part I C Organization

UNIVERSITY OF MINNESOTA HOSPITALS - AFFILIATED HOSPITALS

Facilities

1. Name of the Clinical facility: University of Minnesota Hospitals

2. Is the hospital fully approved by the Joint Commission on Accreditation of Hospitals? Yes

3. Who owns the clinical facility? University of Minnesota

4. Are there written terms of affiliation between the hospital and the medical school? Yes

5. Is the appointment of medical staff, responsible for teaching students, subject to formal approval of the medical school? Yes

6. Is the medical staff closed? Yes

7. May physicians other than medical school personnel assume professional responsiblity for:
   a) Ward Patients? No
   b) Private patients? No

8. List Hospital Standing Committees on which medical school full-time faculty members serve.

   Medical Staff-Hospital Council
   Infection Committee
   Utilization Committee
   Pharmacy Committee
   Medical Records Committee
   Operating Room Committee
   Bed Allocation Committee
   Credentials Committee
   Disaster Committee
   Outpatient Committee

9. House Staff

	Positions Approved (number)	Currently Filled (number)
a) Interships		
Rotating	0	-
Mixed	0	-
Straight(specify)		
Int. Med.	13	13
Surgery	16	16
Pediatrics	12	12
b) Residencies		
Department		
Surgery	36	36
Urology	5	5
Neurosurgery	8	8
Orthopedics	11*	12
Anesthesiology	26	22
Proctology	1	1
Dermatology	14*	12
Internal Medicine	36*	24
Neurology	21*	21*

Cont. - University of Minnesota Hospitals

9. House Staff

b) Residencies

Department	Positions Approved (number)	Currently Filled (number)
Obstetrics & Gynecology	15*	14*
Ophthlamology	19*	18*
Otolaryngology	12*	18*
Pathology	22	31
Pediatrics	24*	24*
Pediatric Cardiology	8	3
Phy. Med. & Rehab.	32	9
Psychiatry	30	27*
Child Psychiatry	4	4
Radiology	50*	58*

*Includes those in affiliated hospitals.

10. Number of teaching beds:

	Total
Anesthesiology	4
Dentistry	1
Obstetrics	20
Gynecology	40
Health Service	30
Medicine	140
Dermatology	8
Opthalmology	24
Otolaryngology	10
Physical Medicine & Rehabilitation	40
Psychiatry - Adult	68
Child	20
Radiotherapy	5
Surgery	128
Urology	23
Orthopedics	24
Neurology	29
Neurology - Neurosurgery	15
Neurosurgery	24
Pediatrics	159
Pediatric Surgery	0
Family Practice	0
Intensive Care Unit	
Open Ward	42
TOTAL	854

11. Does the affiliation with the Out-Patient Department differ from that with the hospital? No

12. Are there specific facilities provided for students to carry out laboratory work on hospital patients? Yes

13.

a)	Hospital admissions last year	No. 15,775
b)	Average length of stay	Days 14.6
c)	Inpatient per diem cost	$95.10
d)	Number of outpatient visits	No. 113,265
e)	Outpatient costs per visit	$10.97

14. a) What is the total operating budget of the facility? $20,541,111

b) How much financial support is derived from:

Patient income	$14,986,919
State appropriation	$ 3,223,196
Endowment	--
Other (specify) County billing	$ 2,330,996

Facilities

1. Name of the clinical facility: Hennepin County General Hospital

2. Is the hospital fully approved by the Joint Commission on Accreditation of Hospitals? Yes

3. Who owns the clinical facility? County of Hennepin

4. Are there written terms of affiliation between the hospital and the medical school? Yes

5. Is the appointment of medical staff, responsible for teaching students, subject to formal approval of the medical school? Yes

6. Is the medical staff closed? Yes

7. May physicians other than medical school personnel assume professional responsibility for:
   a) Ward Patients? No
   b) Private Patients? No

8. List Hospital Standing Committees on which medical school full-time faculty members serve:

   All members of the full-time staff of the Hospital numbering 47 are faculty of the University. The full-time staff are members of all Hospital committees. The attending medical staff with a few exceptions, are either members of the regular or clinical faculty and they may also serve on any hospital committee.

9. House Staff

a) Internships	Positions Approved (number)	Currently Filled (number)
Rotating	48	48
Mixed	-	-
Straight (specify)	-	-

b) Residencies

Departments		
Internal Medicine	12	15
Pathology	4	4
Psychiatry (HCGH Residents)	5	1
Surgery	22	18
Urology (HCGH Residents	3	2
Dermatology	*	2
Neurology	*	2
Obstetrics & Gynecology	*	4
Ophthalmology	*	2
Otolaryngology	*	2
Pediatrics	*	6
Psychiatry (affiliated	*	2
Radiology	*	3
Orthopedics	*	3
Urology (affiliated)	*	1

* Residents rotate from University of Minnesota programs.

Facilities (Cont.-Hennepin County General Hospital)

10. Number of teaching beds: 394

11. Does the affiliation with the Out-Patient Department differ from that with the hospital? No

12. Are there specific facilities provided for students to carry out laboratory work on hsopital patients? No

13.

a)	Hospital admissions last year	No. 11,829
b)	Average length of stay	Days 9.84
c)	Inpatient per diem cost	$67.22
d)	Number of outpatient visits	No. 68,237
e)	Outpatient costs per visit	$16.80

14. a) What is the total operating budget of the facility: (Excluding Capital - 1967) $10,566,501

b) How much financial support is derived from:

Patient income	$4,676,581
State appropriation	$ 118,070
Endowment	None
Other(specify) Misc. Rev.	$ 139,273
Tax Alloc. - County	$6,284,588

Facilities- Amendment-Hennepin County General Hospital

10. Number of teaching beds: 394

	Total	Average Daily Census
Medicine	$2,064,257	79.19
Medical Specialties		31.24
Surgery	$2,797,161	54.73
Surgical Specialties		55.77
Pediatrics	$ 551,990	23.33
Obstetrics & Gynecology	$ 569,361	20.61
Psychiatry	$ 431,756	21.95
Clinical Research Center	-	-
Rehabilitation	-	-
Other	$ 223,092.50	
TOTAL	$6,637.617.50	

Facilities

1. Name of the clinical facility: Veterans Admin. Hospital

2. Is the hospital fully approved by the Joint Commission on Accreditation of Hospitals? Yes

3. Who owns the clinical facility? U.S. Government

4. Are there written terms of affiliation between the hospital and the medical school? No

5. Is the appointment of medical staff, responsible for teaching students, subject to formal approval of the medical school? Yes

6. Is the medical staff closed? Yes

7. May physicians other than medical school personnel assume professional responsibility for:
   a) Ward Patients? No
   b) Private Patients?

8. List Hospital Standing Committees on which medical school full-time faculty members serve.

   Chief of Staff's Professional Staff Meeting
   Medical Executive Committee
   Medical Record Library Committee
   Committee on Therapeutic Agents
   Research and Education Committee
   Hospital Infections Committee
   Utilization Committee
   Tissue Committee
   Tumor Board

9. House Staff

a) Internships	Positions Approved (number)	Currently Filled (number)
Rotating	-	-
Mixed	-	-
Straight (specify) Int. Med.	12	8

b) Residencies

Department		
Internal Medicine	60	63
Pathology	8	7
Dermatology	6	5
General Surgery	27	30
Anesthesiology	8	3
Neurosurgery	3	3
Ophthalmology	5	5
Otolaryngology	4	5
Orthopedic Surgery	12	13
Thoracic Surgery	2	-
Urology	8	7
Phy. Med. & Rehab.	2	-
Psychiatry	12	7

Facilities -(Cont.-V.A. Hospital)

9. House Staff

b) Residencies

Departments	Positions Approved (number)	Currently Filled (number)
Radiology	45	40
Neurology	4	1
Colon & Rectal	1	-

(Note: These are resident allotments to the V.A. Hospital, and are not the total for the University program)

10. Number of teaching beds: 970

	Total	Average Daily Census
Medicine	249	230
Medical Specialties	128	91
Surgery	117	95
Surgical Specialties	251	230
Pediatrics	0	
Obstetrics	0	
Gynecology	0	
Psychiatry	100	95
Clinical Research Center		
Rehabilitation	40	39
Other Neurology	85	80
TOTAL	970	860

11. Does the affiliation with the Out-Patient Department differ from that with the hospital? No

12. Are there specific facilities provided for students to carry out laboratory work on hospital patients? Yes

13. a) Hospital admissions last year — No. 11,465
    b) Average length of stay — Days 27.7
    c) Inpatient per diem cost — $45 per day
    d) Number of outpatient visits — No. 51,777
    e) Outpatient costs per visit — $9

15. a) What is the total operating budget of the facility? $20,000,000

    b) How much financial support is derived from:

Patient income	None
State appropriation	None
Endowment	None
Other (specify)	$20,000,000

Facilities

1. Name of the clinical facility: Saint Paul - Ramsey Hospital

2. Is the hospital fully approved by the Joint Commission on Accreditation of Hospitals? Yes

3. Who owns the clinical facility? County of Ramsey and City of Saint Paul

4. Are there written terms of affiliation between the hospital and the medical school? Yes

5. Is the appointment of medical staff, responsible for teaching students, subject to formal approval of the medical school? Yes

6. Is the medical staff closed? Yes

7. May physicians other than medical school personnel assume professional responsibility for:
   a) Ward Patients? No
   b) Private Patients? No

8. List Hospital Standing Committees on which medical school full-time faculty members serve.

   Executive Committee
   Joint Conference Committee
   Credentials Committee
   Tissue Committee
   Intern and Residency Committee
   Pharmacy Committee
   Medical Records Committee
   Research & Laboratory Committee
   Utilization Committee
   Infection Committee
   Tumor Committee
   Ambulatory Care Committee
   Long Rang Planning Committee
   Cardiac Care Committee
   Public Relations Committee
   Constitutional Amendment Committee
   Admissions Procedure Committee
   Education Committee
   Department Head Subcommittee
   Joint Education Council
   Disaster Committee

9. House Staff

a) Internships	Positions Approved (number)	Currently Filled (number)
Rotating	24	21
Mixed	8	8
Straight (specify)	-	-

Facilities - (Cont.-Saint Paul - Ramsey Hospital)

9. House Staff

b) Residencies

Department	Positions Approved (number)	Currently Filled (number)
Surgery	11	11
*Orthopedics-Fractures	3	2
Pathology	8	1
*Obstetrics-Gynecology	8	3
Urology	4	4
*Medicine	8	7
*Pediatrics	3	3
*Otorhinolaryngology	3	3
*Ophthalmology	3	3
*Dermatology	2	2
*Neurology	2	2
*Psychiatry	2	2
*Radiology	3	3

* Affiliated programs with the University of Minnesota

10. Number of teaching beds: 611 (26 bassinetts)

	Total	Average Daily Census
Medicine	92	70
Medical Specialties	19	19
Surgery	95	79
Surgical Specialties	73	75
Pediatrics	49	21
Obstetrics	26	16
Gynecology	12	14
Psychiatry	86	50
Clinical Research Center	-	-
Rehabilitation	28	18
Other (Tuberculosis)	84	42
TOTAL	564	416

11. Does the affiliation with the Out-Patient Department differ from that with the hospital? No

12. Are there specific facilities provided for students to carry out laboratory work on hospital patients? Yes

14. a) Hospital admissions last year — No. 11,931
b) Average length of stay — Days 11.4
c) Inpatient per diem cost — $66.63 (1967)
d) Number of outpatient visits — No. 120,968
e) Outpatient costs per visit — $7.91

14. a) What is the total operating budget of the facility? $10,585,699.05 (1967)

b) How much financial support is derived from:

Patient income	$4,938,847.78 (1967)
State appropriation	None
Endowment	None
Other (specify) County tax appro.	$5,646,851.27 (1967)

TEACHING BEDS

	University of Minnesota Hospitals		Hennepin County General Hospital	St. Paul- Ramsey Hospital	Veterans Admin. Hospital
	Existing	Proposed	Existing*	Existing*	Existing**
Anesthesiology	4	10			
Dentistry	1	1			
Obstetrics	20	20	38	26	
Gynecology	40	40	12	12	
Health Service	30	30			
Medicine	140	150	111[1]	111[2]	377[2]
Dermatology	8	10	5		
Ophthalmology	24	30	4		
Otolaryngology	10	30	6		
Physical Medicine and Rehabilitation	40	40		28	40
Psychiatry - Adult	68	68	20	86	100
Child	20	20			
Radiotherapy	5	10			
Surgery	128	140	59	168[3]	368[3]
Urology	23	30	10		
Orthopedics	24	30	11		
Neurology	29	30	27		85
Neurology - Neurosurgery	15	15			
Neurosurgery	24	30			
Pediatrics	159	160	61[1]	49	
Pediatric Surgery	0	20			
Family Practice	0	20			
Intensive Care Unit		50			
Open Ward	42	20			
Trauma			30		
Bassinets			30		
Other				84	
TOTAL	854	1013	424	564	970

1 Includes Isolation Beds 2 Includes Medical Specialties 3 Includes Surgical Specialties

* See Following Page

* Future expansion of these facilities, based on the anticipated increase in Medical School enrollment, has not been determined. Further development of plans, expected by fall, 1969, for the new curriculum will allow a projection of needed beds and facilities at affiliated hospitals. A $25 million bond referendum regarding funding for the construction of a new Hennepin County General Hospital will be presented to Hennepin County voters on September 9, 1969. The results of this vote will alter the disposition of Medical Students to the various major affiliated hospitals. Appropriate projections will be submitted to the National Institutes of Health by October 1, 1969. See Letters of Intent from affiliated hospitals and the Educational Policy Committee Statement regarding affiliated hospitals.

** No increase in bed capacity currently planned.

ST. PAUL-RAMSEY HOSPITAL and MEDICAL CENTER
ST. PAUL, MINNESOTA 55101

April 25, 1969

Robert B. Howard, M.D.
Dean, College of Medical Sciences
University of Minnesota
Minneapolis, Minnesota 55455

Dear Doctor Howard:

The Saint Paul - Ramsey Hospital and Medical Center, an affiliated hospital of the University of Minnesota College of Medical Sciences, plans to request assistance under the Health Professions Educational Assistance Program in connection with the student increase. The amount of such assistance will be determined in consultation with the College of Medical Sciences of the University of Minnesota.

Very truly yours,

John F. Perry, Jr.

John F. Perry, Jr., M.D.
Chief of Surgery

JFP/j

General Hospital

Hennepin County

Fifth & Portland South, Minneapolis, Minnesota 55415

April 18, 1969

Robert B. Howard, M.D., Dean
College of Medical Sciences
1360 Mayo Memorial Building
University of Minnesota
Minneapolis, Minnesota 55455

Dear Dr. Howard:

This letter is written in response to your request to the affiliating hospitals of the University of Minnesota regarding the University's application for funds under the Federal Health Professions Educational Assistance Program.

The Hennepin County General Hospital Advisory Board has indicated its intent to authorize, at a future time, Hennepin County General Hospital to apply for funds under the Health Professions Education Assistance Program to permit this institution, through the University of Minnesota, to increase its clinical facilities for the training of undergraduate medical and dental students.

Very truly yours,

Paul J. Vogt
Administrator

Richard B. Raile, M.D.
Medical Director

rep

cc Erwin M. Schaffer, D. D. S., Dean
School of Dentistry
University of Minnesota

Proposed Statement by the Education Policy Committee for

Facilities Funding Request to NIH

May 15, 1969

In the present curriculum undergraduate medical student teaching is carried out in affiliated hospitals in the second, third, and fourth years. Slightly less than half of the clinical teaching time is now the responsibility of faculty in off-campus locations.

The recently adopted curriculum calls for clinical teaching in each year of both the three and the four year program. Even before expansion of class size occurs, the new curriculum will change the type of clinical teaching program by earlier exposure to patients, by abolition of the present clinical clerkship rotation in favor of a more structured and integrated organ system orientation and a deemphasis of the mechanical aspects of the clerkship, all in the core curriculum. In the tracking portion, the individual student with his advisor will select his program according to career objectives. A return to the basic sciences for a portion of the elective period will be encouraged. The net balance of all these factors bearing on facilities requirements by the new curriculum will probably be that the same fractional distribution of needs as at present will result, or a slightly increased need for teaching facilities in affiliated hospitals could be required.

Additionally, however, expansion of the class size by 25% (to 200 students) could require an expansion of clinical teaching facilities in affiliated hospitals beyond the proportionate fraction of class expansion. This discrepancy could result from such factors as a proposed net increase in number of on-campus teaching beds which is less than the class size increase proposed, the difficulty in developing affiliated teaching facilities in the other health sciences thus a higher total density of clinical health sciences teaching in

on-campus clinical facilities, the necessary selectivity of proposed on-campus expansion leading in turn to selective creation or enlargement of other types of affiliated programs, and the limits imposed by the existing discrepancy in patient mix in the University Hospitals compared with off-campus facilities.

To meet the increased demands for off-campus clinical teaching facilities incurred by these qualitative and quantitative changes the University must assist its affiliates in every possible way. It will support the expansion of appropriate facilities in St. Paul-Ramsey and the Veterans Hospital for this purpose. It will assist Hennepin County General Hospital to achieve a new structure whose location and facilities for undergraduate teaching are in the best interests of the University program. Existing programs in private hospitals of the Twin Cities will be improved, and when appropriate expanded. New affiliations in private hospitals will also be considered.

The Education Policy Committee is presently developing detailed tactical plans for implementing the new curriculum. A referendum will be held September 9, 1969 to determine financing of a new facility for Hennepin County General Hospital. The development of these two issues are critical to establishment of finite planning for the clinical affiliated facilities.

AGREEMENT OF AFFILIATION

between

THE REGENTS OF THE UNIVERSITY OF MINNESOTA

and

THE BOARD OF COMMISSIONERS, HENNEPIN COUNTY

In sharing the common goals of education, research, patient care and community service, it is deemed to the mutual advantage and benefit of the respective parties, their constituency and their purposes, to facilitate continuity of the longstanding relationship between the University of Minnesota and Hennepin County General Hospital, successor to Minneapolis General Hospital.

In pursuance of the aforesaid goals and in furtherance of Session Laws of 1963, Chapter 738, the act establishing the Hennepin County General Hospital providing for the hospital care and medical service of the poor and medically indigent, for emergency care of others, and for the purposes of instruction and promotion of scientific research promoting the welfare of patients, this AGREEMENT OF AFFILIATION is provided.

The following principles shall characterize the general relationships between the respective parties:

I. Faculty and Hospital Staff Appointments

A. Power of Appointment

1. Appointment to the Medical Staff of HCGH is a function of HCGH. A member of the Medical Staff who will teach undergraduate medical students and/or Medical Fellows shall also be a member of the Faculty of the University of Minnesota Medical School.

2. Appointment to the Faculty of the Medical School is a function of the University, Prospective HCGH Medical Staff members with proposed teaching functions will be recommended by their respective Service Chiefs of HCGH for Faculty membership in the cognate Medical School Department. If approved by the Department, the recommendation will be forwarded for action by the Dean of the College of Medical Sciences, the President, and the Regents.

3. Service Chiefs at HCGH will be nominated for such posts by the Heads of the cognate Medical School Departments with the endorsement of the Dean and subject to the approval of the Medical Staff, Medical Director and Administrator of HCGH.

B. Categories of Faculty Membership

1. The Faculty serving full-time at HCGH is recognized as the equivalent of the Faculty serving full-time at the Medical Center with respect to clinical skill, teaching ability, and potential for scholarly

activity. Ideally, the rights, privileges, opportunities, and obligations of all Faculty members should be determined by their academic ranks, not by the locations in which they serve. Full equivalence of Faculty appointments should be the ultimate aim of both HCGH and the University. At the time of adoption of this statement, however, realistic account must be taken of the budgetary limitations of both institutions, as well as certain differences between them with respect to salary policies and related matters. For this reason, at least at the outset, Faculty appointments of full-time HCGH staff members must necessarily be subject to certain modifications as described in the following paragraphs. In any event, however, members of the Faculty serving as full-time members of the HCGH Staff will enjoy the same rights and privileges as other University Faculty members of equivalent rank with respect to participation in Department and Medical School Faculty meetings dealing with educational policy. Other aspects of their Faculty membership, including mode of compensation and inclusion under the University tenure code, will vary in accord with the specific type of appointment they hold.

2. Types of Full-time Appointments

a. Regular University appointments. Names of individuals holding Regular University appointments will appear as primary items on their respective University Departmental budgets, and they will be included, without reservation, in the provisions of the University tenure code. They will receive their comepnsation in the form of a University paycheck, regardless of the source of the funds providing it. Compensation will, in most instances, include both a "basic salary", which will be the salary comparable to the salary paid comparable individuals serving full-time at the University of Minnesota Medical Center and an "increment", the amount of which will be a matter for determination by HCGH within the context of its salary scale. University fringe benefits, notably participation in the University's retirement program, will be based on the level of the "basic salary" as defined herein with the exception of those individuals participating in the University's retirement program on January 1, 1964, who shall, subject to retirement program modifications and personal elections, have their University fringe benefits based on the level of total salary designated in University budgets for 1963-64, and shall so remain until the "basic salary" as herein defined exceeds the 1963-64 amount. Eligibility for Regular University appointments is limited to full-time Chiefs of those Services responsible for mandatory, full-time clerkships for undergraduate medical students.

b. "Affiliated Hospital University" Appointments. The University will establish a special, separately identified budget account to be known as the "Hennepin County General Hospital Fellowship Program." The names of Faculty members designated as "Affiliated Hospital University" appointees will appear as primary items on

this budget, and they will not be included in the provisions of the University tenure code. Appointments will continue as long as HCGH is willing and able to continue its support. In all other respects, specifically including the various aspects of compensation, "Affiliated Hospitals University" appointees will be subject to the same considerations that apply to Regular University employees. Participation in University fringe benefits will be determined separately. Any faculty member serving full-time at HCGH may, with the concurrence of his HCGH Medical Director, University Department Head, and Dean of the Medical School, hold an "Affiliated Hospital University" appointment.

c. Primary HCGH Appointments. Faculty members serving full-time at HCGH may elect to be primary appointees of HCGH. In such instances, compensation will be paid to them directly by HCGH and the University tenure code will not apply.

3. Volunteer University Faculty appointments will carry the titles Clinical Professor, Clinical Associate Professor, Clinical Assistant Professor, and Clinical Instructor. These carry no implications as to either compensation or tenure.

C. Sources of Budgetary Support

1. As indicated above, all Faculty members serving full-time at HCGH as either Regular University or Affiliated Hospital University appointees will receive their compensation in the form of a University paycheck. The respective proportions provided by the University and HCGH will be negotiated by the two institutions each year with respect to each individual appointee, and HCGH will then pay the agreed upon amount to the University. The actual proportion provided by the University is in no way related to or determinative of the individual's "basic salary" as defined in Paragraph B-2-a. above. The liability of the parties for providing resources for fringe benefits is to extend to each party in the proportion of its segment of the "basic salary." However, if, due to legal limitations, total contribution cannot be provided, HCGH shall make payment to the University, by separate check, of the maximum amounts applicable to any and all fringe benefits for a HCGH appointment, to provide its contribution to the fringe benefits allocable to its segment of "basic salary."

D. Private Consultation Practice

1. Faculty members serving full-time at HCGH, including both Regular and Affiliated Hospital University appointees, as defined in paragraphs B-2-a and B-2-b above, will be expected to observe the Regents' Statement of Policy concerning Private Consultation Practice in the College of Medical Sciences.

II. Interns

The selection, appointment, education, training, and supervision of interns at HCGH shall be the primary responsibility of HCGH Medical Staff.

III. Medical Fellows

The selection, appointment, assignment, education, training, and supervision

of Medical Fellows shall be a joint venture involving the cognate Medical School department head and HCGH Chief of Service, with primary responsibility for final determinations being the prerogative of the party with the respective accreditation listing, but with the understanding that all appointments as Medical Fellows are subject to the approval of the Dean of the Graduate School of the University of Minnesota.

IV. Medical Students and Patients

Medical students shall be responsibly involved in the management of the care of the patient under the supervision of the assigned HCGH Medical Staff; the medical students' activities shall include doing patient histories and complete physical examinations, stating tentative diagnosis, proposing diagnostic and therapeutic procedures, and proposing recommendations for discharge; and the course of patient care shall include outpatient and other extensions of its service as well as inpatient care to the fullest degree possible.

V. Referral of Hennepin County Patients

Referral of patients from Hennepin County for hospital care and medical service is of key importance to the operation of both HCGH and the University Hospitals. Policies concerning referral of patients from Hennepin County and the determination of their acceptance for care will be developed by and implemented under the continuing direction of the 1Affiliation Review Committee (see IX below) or an appropriate subcommittee thereof consisting of representatives of the two hospitals.

VI. Patients and Teaching

All patients admitted to HCGH will be participants in the teaching program, except where, in the opinion of the responsible physician, such incorporatia would jeopardize the welfare of the patient.

VII. Patient Care

HCGH is to maintain the highest possible standards of care for its patients, and the Medical School shall assist in this effor since the participation of medical students in the processes of patient care is an integral part of medical education.

VIII. Facilities and Services

Available facilities and services of the respective parties shall be periodically reviewed to encourage appropriate and optimum cross-utilization as well as for adequacy in fostering improved patient care and medical education.

IX. Affiliation Review Committee

An affiliation Review Committee shall concern itself with the continuing implementation of the principles of this Agreement, to review program activities, to effect continued improvement in the affiliation program, and to report on its progress. The Committee shall meet at least biannually and be composed of the following (or their authorized representatives):

Dean of the Medical School,
Medical Director of HCGH,
Administrator of University of Minnesota Hospital,
Administrator of HCGH,
Medical School and HCGH: four representatives of the HCGH staff and four representatives of the University Hospitals, to be selected by each institution in accord with its own procedures.

X. Subject to the availability of appropriations for approved program activities, ADDENDUMS to this AGREEMENT OF AFFILIATION are authorized to facilitate day-to-day and year-to-year execution of the common goals stated herein. The ADDENDUMS shall be sufficiently detailed in content to explain the basic elements of understanding and obligation, financial and otherwise. All ADDENDUMS shall bear the initiating concurring signatures of the respective Medical School department head and HCGH Chief of Service, the approval signatures of the Dean of the Medical School and of the Medical Director of HCGH or their authorized representatives, and of the Administrator of HCGH and whomever the University of Minnesota designates to authorize the commitment of available funds.

XI. This agreement shall be effective July 1, 1964, and shall continue from year to year without renewal notice. In the event either party wishes to propose a major change in or termination of the Agreement, adequate notice shall be given -- for a major change, three calendar months' notice in writing would be deemed adequate; and in the event of termination, one calendar year's notice must be given.

Recommended:

Regents of the University of Minnesota

Dean of the College of Medical Sciences

Vice President, Business Administration

Hennepin County Board of Commissioners

Administrator, Hennepin County General Hospital

Chairman

St. Paul-Ramsey Hosp.

Final Draft as Recommended by
Dean, College of Medical Sciences

AFFILIATION AGREEMENT BETWEEN ST. PAUL-RAMSEY HOSPITAL AND THE UNIVERSITY OF MINNESOTA

I

What appears below is an agreement of affiliation between St. Paul-Ramsey Hospital and the University of Minnesota. As such, it is the statement of an affiliation between two institutions and two communities dedicated to medical education and the advancement of medical knowledge through patient care and community service, medical education, and research.

The St. Paul-Ramsey Medical Staff and Administration and the Ramsey County Welfare Board recognize that a teaching affiliation with the Medical School is essential if St. Paul-Ramsey Hospital is to provide a perpetuating high quality of medical-hospital care and services to the citizens of St. Paul and Ramsey County and a supply of competent professional personnel. The Hospital places a high value on the Medical School for its ability to aid continuously in defining standards of medical service, education, and research and will utilize the University in such a way as to fulfill the educational standards expected of it. In turn the University of Minnesota will aid in whatever way it sees possible and appropriate to facilitate the objectives of this agreement. The University and its College of Medical Sciences need the facilities and services which a teaching hospital can provide through its wards, clinics, and medical staff for the teaching of clinical medicine.

A key feature of this affiliation is the appropriate appointment and function of the herein described Joint Educational Council whose responsibility it will be to know the commitment contained in this agreement and the appropriate functions of both institutions with respect to this agreement. It is of paramount importance that the Council be duly and appropriately selected and so composed that its decisions command the respect of the University of Minnesota and St. Paul-Ramsey Hospital, alike, for it will be a formal and policy shaping agency to this agreement. It will have the responsibility of periodic formal revision of this agreement.

It shall be recognized that shared goals can be realized most effectively if the affiliation is basically an institution-to-institution agreement providing a framework of meaningful support and guidance to the important transactions between departments and divisions of each institution. There will be instances, however, in which at any given time certain departments or divisions of the Hospital and Medical School will not be directly involved in responsibility for a teaching program.

Recognizing that any agreement of affiliation acceptable to both parties is quite likely to require amendments and changes in the current bylaws of the Hospital Medical Staff and in equivalent documents of the College of Medical Sciences, such amendments shall be consonant with the Law and shall not force either institution to exceed its financial resources.

Finally, it has been well said that no institution can be seriously or justly contemplating entering into an educational agreement unless it has education in mind.

The following principles shall characterize the general relationships between the respective parties:

II
Faculty and Hospital Staff Appointments

A. Power of Appointment.

1. Appointment to the medical staff of St. Paul-Ramsey Hospital is a function of St. Paul-Ramsey Hospital.
2. Appointment to the Faculty of the University of Minnesota Medical School is a function of the University.
3. All departmental or division Service Chiefs shall be nominated by the Head of the cognate Department at the University of Minnesota Medical School after consultation with a committee of the medical staff selected by the Chief of Staff at St. Paul-Ramsey Hospital. These nominations shall then be forwarded to the Executive Committee of the Hospital for approval and then to the Governing Body of the Hospital,

the Dean of the College of Medical Sciences, the President and the Board of Regents for their final approval and appointment.

4. In addition to the appointment of Service Chief as described above and beginning with the date that this agreement of affiliation is formally approved, it is expected that anyone appointed to the Medical Staff of St. Paul-Ramsey Hospital shall be qualified for an appointment to the faculty of the University College of Medical Sciences and shall indeed be so appointed. The prospective appointee shall be recommended by their respective Service Chiefs after they have demonstrated their ability to meet the requirements of such membership. If approved by the cognate Department Head at the Medical School, the recommendation will be forwarded for action by the St. Paul-Ramsey Executive Committee, the Ramsey County Welfare Board, the Dean of the College of Medical Sciences, the President and the Board of Regents.

5. The medical staff members of the Hospital and the administration recognizes by merit of dual appointments the holders of such appointments are responsible to both institutions in terms of the objectives, goals and responsibilities of each institution.

6. In any situation where the professional competence of any member of the full time staff at St. Paul-Ramsey Hospital is seriously questioned, a two-thirds majority of the Executive Committee of that Hospital will refer the matter to the Joint Educational Council.

B. Qualifications of Medical Staff Appointments and University Faculty Membership.

1. It is recognized that members of the Faculty of the Medical School serving as full time Staff at St. Paul-Ramsey Hospital are the equivalent of the faculty serving full time at the Medical School with respect to clinical skill, teaching ability, and potential for scholarly activities and therefore shall enjoy, in general, the same rights and privileges and have the same obligations as other comparable University Faculty

members. The nature and extent of the rights, privileges and obligations will be negotiated in individual instances through the Joint Educational Council and will take account of legal and financial limitations of the University and of St. Paul-Ramsey Hospital.

2. Full time University Appointments.

(a) Full time members of the Medical Staff of St. Paul-Ramsey Hospital may wish to receive their compensation through the University, and they may do so at their option, regardless of whether the actual source of such compensation is the University, St. Paul-Ramsey Hospital, a research grant, or a combination of such sources.

(b) The policies determining such appointments shall be the same as those applied throughout the College of Medical Sciences. In particular, the statement entitled "General Policies Concerning Support of Faculty Positions in the College of Medical Sciences with Special Reference to Utilization of Non-Regular Funds" and dated August 1, 1966, shall apply. Funds provided by St. Paul-Ramsey Hospital are "non-regular" funds.

(c) It is recognized that, for a number of reasons, the salary scale for members of the full time Medical Staff of St. Paul-Ramsey Hospital is higher than that for faculty members serving full time at the University of Minnesota Medical Center. For this reason their compensation will, in most instances, include both a "basic salary," which will be the salary comparable to the salary paid comparable individuals serving full time at the University of Minnesota Medical Center, and an additional amount of basic salary to be determined by the County Welfare Board. University fringe benefits, notably participation in the University's retirement program, will be based on the level of the "basic salary" as determined by the University of Minnesota Medical Center.

(d) Alternately, St. Paul-Ramsey Hospital Staff members serving full time at the Hospital may prefer to receive all of their basic compensation directly from the Ramsey County Welfare Board, in which event the University fringe benefits will not apply.

3. Other University Faculty appointments. Members of the Hospital's Medical Staff participating in the teaching program at St. Paul-Ramsey Hospital on a part time and usually non-compensated basis will be expected as of the date this agreement of affiliation is formally approved to qualify for appointment to the Faculty of the College of Medical Sciences. They will be appointed Clinical Professor, Clinical Associate Professor, Clinical Assistant Professor and Clinical Instructor. Such appointments as far as this agreement is concerned carry no implications as to either compensation, or fringe benefits.

III
Sources of Budgetary Support

The governing body of the St. Paul-Ramsey Hospital recognizes that excellence in patient care, community services, and health science education pre-supposes adequate financial support in all areas of administration and staffing of St. Paul-Ramsey Hospital. Likewise, the University recognizes its fundamental obligation to provide financial support of the educational program for the undergraduate medical student, that is, the student pursuing the course leading to the M.D. degree. Faculty members serving full time at St. Paul-Ramsey Hospital may receive their compensation in the form of a University pay check in accord with Paragraph B-2 above. The respective proportions provided by the University and St. Paul-Ramsey Hospital will be negotiated each year by the two institutions with respect to the individual appointee and St. Paul-Ramsey Hospital will then pay the agreed upon amount to the University. The actual proportion provided by the University is in no way related to or determinative of the individual's "basic salary." The liability of the University for provision of fringe benefits will extend only to that segment

of the basic salary actually provided by the University. St. Paul-Ramsey Hospital will include in its payment to the University the amount required to provide fringe benefits in relation to the segment of basic salary actually provided by St. Paul-Ramsey Hospital.

IV

The Joint Educational Council

A. Responsibilities

1. The primary responsibility of the Council shall be the evaluation and arbitration concerning undergraduate and postgraduate medical education programs within the confines of this agreement. Their deliberations shall encompass the practices of both institutions insofar as this agreement applies.

2. Being constituted of members selected from among key staff members of both institutions, it is the formal arbitrating body in all matters relating to this agreement of affiliation, including any differences that may arise and any modifications of the agreement that may be deemed necessary or advisable.

3. The recommendations of all meetings will be forwarded in writing to the St. Paul-Ramsey Hospital Superintendent, Chief of Staff, Chairman of the Ramsey County Welfare Board, and the Dean of the College of Medical Sciences. Inasmuch as such recommendations are specifically given for the educational policy to be pursued by both institutions in regard to medical education at St. Paul-Ramsey Hospital, it shall be the specific duty of the Superintendent of St. Paul-Ramsey Hospital and the Dean of the University College of Medical Sciences to forward in writing within a reasonable period of time after the receipt of such recommendation, positive or negative actions they respectively intend to take concerning the recommendations along with the rationale for the action.

4. Whenever dismissal of any dually appointed medical staff member is contemplated, such deliberation shall be forwarded to the Joint Educational Council for its recommendation.

5. The Joint Educational Council will honor requests of Service Chiefs at both St. Paul-Ramsey Hospital and the College of Medical Sciences for appearance before the Council to present their views regarding educational programs at St. Paul-Ramsey Hospital. It is further agreed that no matter of direct concern to a Service Chief at St. Paul-Ramsey Hospital shall be discussed without its being formally placed on the agenda, and without the presence of the Service Chief concerned.

6. The Council shall periodically review the affiliation agreement and make recommendations for changing it where deemed necessary.

B. Composition and Method of Selection.

To ease the problem of assembly and communication, the Council shall be comprised of not more than nine members. They shall be as indicated in the following:

One Ramsey County Welfare Board member selected by that Board

One Ramsey County Welfare Board Hospital Advisory Committee member selected by that committee.

One St. Paul-Ramsey Hospital Administrator (the Superintendent or his designee)

Two St. Paul-Ramsey Hospital full time staff members selected by St. Paul-Ramsey Hospital Executive Committee

One St. Paul-Ramsey Hospital visiting staff member selected by St. Paul-Ramsey Hospital Executive Committee

One Dean of the Medical School or his designee

Two members of the Faculty of the University of Minnesota Medical School to be selected by the Administrative Board of the Medical School

C. Meetings.

The Council shall meet no less than bimonthly during the entire year. Its chairman shall be the Dean of the Medical School or his designee. The Council shall make its own provisions for the calling of special meetings.

V

Undergraduate and Postgraduate Educational Programs

A. Medical Students.

The assignment, rotation, and program for medical students shall be the joint responsibility of the University Department Head and the cognate Service Chief. Assigned undergraduate medical students shall be responsibly involved in the management of the care of the patient under the supervision of the St. Paul-Ramsey Hospital Medical Staff. The medical students' activities shall include doing patient histories and physical examinations, stating tentative diagnosis, proposing diagnostic and therapeutic procedures, and proposing recommendations for discharge, and the course of the patient care shall include outpatient and other extensions of its service as well as inpatient care to the fullest degree possible.

B. Medical Interns.

Medical interns shall practice medicine at St. Paul-Ramsey Hospital under the direct supervision of the Service Chiefs and the intern and Resident Committee of the Hospital. Since the medical intern program is one of postgraduate education the intern educational program shall come up for periodic evaluation and recommendation by the Joint Educational Council. Otherwise the selection, appointment, training, supervision and remuneration of interns at St. Paul-Ramsey Hospital shall be the primary responsibility of St. Paul-Ramsey Hospital, its staff and governing body.

C. Medical Fellows.

Selection, appointment, assignment, education, supervision, and remuneration of medical fellows shall be a joint venture involving the cognate Medical School Department Head and the St. Paul-Ramsey Hospital Chief of Service, with primary responsibility for final determinations being the prerogative of the party with the official accreditation listing. All appointments as medical fellows, however, must have the additional approval of the Dean of the Graduate School of the University of Minnesota for

VI
Patients and Teaching

All patients admitted to St. Paul-Ramsey Hospital shall be available for participation in the teaching program, unless objecting, and except where, in the opinion of the responsible physician, such incorporation would jeopardize the welfare of the patient.

VII
Enactment, Revision, and Termination of Agreement

This agreement shall be effective immediately upon its proper ratification by the responsible parties designated immediately below. It shall continue from year to year without renewal notice. Its periodic revision shall be the primary responsibility of the Joint Educational Council. In the event either party wishes to propose a major change in the agreement written notice given three months in advance to the Joint Educational Council would be adequate. In the event of termination, three years notice in advance shall be given.

UNIVERSITY OF MINNESOTA COLLEGE OF
MEDICAL SCIENCES

By_____
Dean of the College of Medical Sciences

UNIVERSITY OF MINNESOTA

By_____
Vice President, Business Administration

SAINT PAUL-RAMSEY HOSPITAL

By_____
Chief of Medical Staff

SAINT PAUL-RAMSEY HOSPITAL

By_____
Superintendent

RAMSEY COUNTY WELFARE BOARD

By_____
Chairman

Dated: November_____, 1966

Part I C Organization

RELATIONSHIPS TO CLINICAL PROGRAMS

Overall curricular development and control is vested with the Education Policy Committee of the faculty. Clinical programs are developed in the various clinical departments within the guidelines established by the objectives and goals of the curriculum. The Council of Clinical Sciences and Council of Basic Sciences consider problems of the educational needs of the school within the curricular framework. The individual teaching programs, conducted in the various affiliated hospitals, also fall within purview of the appropriate hospital committees appointed by the Dean of the College of Medical Sciences. These committees, the Joint Educational Council of the St. Paul-Ramsey Hospital, the Joint Education Advisory Committee of the Hennepin County General Hospital and the Dean's Committee of the Veterans Administration Hospital, supervise and coordinate the educational programs within these hospitals.

UNIVERSITY OF MINNESOTA
Medical School
~~Projected Expenditures~~ Through 1975

This table of data follows the format for itemization of expenditures presented in reports to the Liaison Committee on Medical Education, American Medical Association - Association of American Medical Colleges.

	1968-69	1969-70	1970-71
A. I. Expenditures for Sponsored Medical School Programs*			
a. Federally-Sponsored Teaching and Training	$ 4,122,990	$ 4,535,289	$ 4,988,818
b. Non-Federal Sponsored Teaching and Training	902,266	992,493	1,091,742
TOTAL, Sponsored Teaching and Training Programs	5,025,256	5,527,782	6,080,560
c. Federally Sponsored Research	10,451,213	11,496,334	12,645,967
d. State, County and City Sponsored Research	145,364	159,900	175,890
e.-h. Private Gifts and Grants Sponsoring Research	2,740,711	3,014,782	3,316,260
TOTAL, Sponsored Research	13,337,288	14,671,016	16,138,117
j. Other Sponsored Programs-Non Federal	11,106	12,217	13,439
k. TOTAL, Sponsored Medical School Program*	18,373,650	20,211,015	22,232,116
A.II. Expenditures for Regular Teaching, Research, and Service Programs of the Medical School			
a. & b. Expenditures from Medical School Budget**	3,953,017	4,751,553	6,002,175

UNIVERSITY OF MINNESOTA
Medical School
Projected Expenditures Through 1975

This table of data follows the format for itemization of expenditures presented in reports to the Liaison Committee on Medical Education, American Medical Association - Association of American Medical Colleges.

	1971-72	1972-73	1973-74	1974-75
A. I. Expenditures for Sponsored Medical School Programs*				
a. Federally-Sponsored Teaching and Training	$ 5,487,700	$ 6,036,470	$ 6,766,279	$ 7,558,610
b. Non-Federal Sponsored Teaching and Training	1,200,916	1,321,008	1,480,718	1,654,110
TOTAL, Sponsored Teaching and Training Programs	6,688,616	7,357,478	8,246,997	9,212,720
c. Federally Sponsored Research	13,910,564	15,301,620	18,151,586	20,277,137
d. State, County and City Sponsored Research	193,479	212,827	238,558	266,493
e.-h. Private Gifts and Grants Sponsoring Research	3,647,886	4,012,675	4,497,807	5,024,500
TOTAL, Sponsored Research	17,751,929	19,527,122	22,887,951	25,568,130
j. Other Sponsored Programs-Non Federal	14,783	16,261	18,227	20,361
k. TOTAL, Sponsored Medical School Program*	24,455,328	26,900,861	31,153,175	34,801,211
A.II. Expenditures for Regular Teaching, Research, and Service Programs of the Medical School				
a. & b. Expenditures from Medical School Budget**	7,240,910	8,542,924	9,707,442	10,886,295

UNIVERSITY OF MINNESOTA
Medical School
Projected Expenditures Through 1975
(continued)

	1968-69	1969-70	1970-71
c. Administrative Buildings and Grounds, Library and other Medical School costs paid by the University but not included in item a.***	$ 2,875,630	$ 3,048,168	$ 3,231,058
d. Teaching Hospitals or Clinics Costs Related to Teaching****	3,994,290	4,233,947	4,487,984
d. (4) Special Unrestricted Funds	12,000	79,500	30,000
d. (5) Other	3,000	3,000	3,000
TOTAL Expenditures for Regular Medical School Programs	10,837,937	12,116,168	13,754,217
TOTAL Medical School Costs	29,211,587	32,327,183	35,986,333

* See page M-55 C

UNIVERSITY OF MINNESOTA
Medical School
Projected Expenditures Through 1975
(continued)

	1971-72	1972-73	1973-74	1974-75
c. Administrative Buildings and Grounds, Library and other Medical School costs paid by the University but not included in item a.***	$ 3,424,921	$ 3,630,416	$ 3,848,241	$ 4,079,135
d. Teaching Hospitals or Clinics Costs Related to Teaching****	4,757,263	5,042,699	5,345,261	5,665,977
d. (4) Special Unrestricted Funds	30,000	30,000	30,000	30,000
d. (5) Other	3,000	3,000	3,000	3,000
TOTAL Expenditures for Regular Medical School Programs	15,456,094	17,249,039	18,933,944	20,664,407
TOTAL Medical School Costs	39,911,422	44,149,900	50,087,119	55,465,618

* See page M-55 C

UNIVERSITY OF MINNESOTA

Medical School

Projected Expenditures through 1975

* Amounts projected in these categories are based on a percentage increase of 10 percent per year for the first four years and for the last two years are related to annual increments in funds for academic new positions, plus an annual 6 percent increase in academic salaries.

** The projected Medical School budget has been increased annually in accordance with the following assumptions:

A. Annual academic salary increases of 6 percent.

B. Special funding for Family Practice:

$200,000 in 1969-70 and additional increment of $150,000 in 1970-71.

C. Further new academic position funds required to bring funding to faculty staffing standards presented by the University of Minnesota.

1969-70	$225,000
1970-71	453,600
1971-72	476,280
1972-73	499,500

D. New faculty positions required by student enrollment increases

1973-74	$342,250
1974-75	359,362

This represents one-half of the new faculty positions required by student enrollment increases. The balance will be added during fiscal years 1975-76 and 1976-77.

E. Funds for Civil Service new positions = 0.648 times amounts allocated for academic new positions.

F. Civil Service salary increases, alternating 4 and 8 percent each year, starting with 8 percent in 1969-70.

*** These amounts have computed through application of a standard formula developed by the University of Minnesota; an annual 6 percent increment has been included.

**** This category includes items in the University of Minnesota Hospitals budget that have been reported as appropriately chargeable to Medical School educational programs. This category is currently under scrutiny as to its relationship to the educational program.

Section I F

ACCREDITATION

AMA-AAMC Liaison Committee on Medical Education Accreditation visit: January 20 - 23, 1969. Proposed date for next visit: 1979.

An official accreditation report has not been received, as yet.

The following item regarding facilities is quoted from the letter of the Chairman of the site visit,Dr. C. Arden Miller, to Dr. Malcolm Moos, President of the University of Minnesota:

> "The committee commends the university for its responsiveness to public need by developing plans to admit 200 students. The increase seems in every way justified and possible, provided of course that additional resources become available. Requests now pending represent budget and buildings necessary to correct existing deficiencies, as well as to expand enrollment. The requests are thoughtfully developed, well supported, and probably adequate to anticipated expansions. Authorization for the expanded enrollment is especially important to the school of medicine as it is the device by which relief for current as well as anticipated deficiencies is sought."
>
> "Proposed physical expansions are clearly necessary and probably they are sufficient; they are not optimal. Responsible administrators appear to have scaled down their building plans to conform to anticipated realities of financing, rather than to actual need. When the entire building program is completed basic science departments will have 250,000 gross square feet * of space. This amount is currently recommended for new medical schools of somewhat smaller enrollment than Minnesota's. The building plans, even if entirely implemented, clearly will not eliminate the medical school's space problems."

Letter of reasonable assurance for continuing accreditation of expansion program has been requested on the basis of the January, 1969, Accreditation Survey and should be in hand by the time of the proposed site visit.

* Dr. Miller misunderstood the appropriate square footage which should be 250,000 <u>net</u> square feet. ROM

CURRICULUM

The information provided in the following pages describes the 1968-69 curriculum, which has been a prototype for the last decade, and an extensive modification in total curriculum which has been planned to commence in the fall of 1969.

Part I G Program

CURRICULUM

The 1969-70 curriculum is an interim one since the current second year class will have had the first year program of the old curriculum. This is true also of the current third class which will have had 2 years of the old curriculum. The fourth year of the current curriculum is a prototype of Phase D of the new curriculum. The entering 1969-70 class will be the first to take advantage of Phase A of the new curriculum.

FIRST YEAR

Course No.	Subject	Department	Number of Hours: Lecture	Lab	Clinic	Total
100,101	Gross human Anatomy	Anatomy	70	210	Several Included	280
103,104	Human Histology	Anatomy	60	80		140
107	Embryology	Anatomy	30	40	Several Included	70
100,101	Biochemistry	Biochemistry	108	114		222
106	General Physiology	Physiology	15	15		30
111,106	Neuroanatomy-Neurophysiology	Anatomy Physiology	54	72	Several Included	126
107	Radiobiology, Biophysics	Nuclear Medicine, Radiology	10	-		10
120	Human Behavior	Clinical Psychology, Psychiatry	30	-		30

SECOND YEAR

Course No.	Subject	Department	Number of Hours: Lecture	Lab	Clinic	Total
105,106	Microbiology Infectious Diseases	Microbiology	100	80	Several Included	180
101,102	General & Special Pathology	Pathology	100	160		260
107	Systemic Physiology	Physiology	50	45		95
103,104	Pharmacology	Pharmacology	90	60		150
124	Introduction to Obstetrics & Gynecology,	Obstetrics & Gynecology	10	-		10
101 101	Orientation in Clinical Medicine & Clinical Laboratory Medicine	Medicine, Pediatrics, Lab. Medicine	117	46	80	243

SECOND YEAR

Course No.	Subject	Department	Lecture	Lab	Clinic	Total
121	Introduction to Surgery	Surgery	10	-		10
121	Introduction to Psychiatry	Psychiatry	30	-		30
100	Public Health & Preventive Medicine	Public Health	60	-		60
90	Biostatistics Biometry	Public Health	20	20		40

THIRD YEAR CLERKSHIPS

Subject	Department	Inpatient or Outpatient	No. of weeks in Clerkship	No. of days per week	Average Hours Per Day	Average No. of New Patients Weekly per Student	Average No. of Total Patients Weekly per Student
Internal Medicine	Medicine	Both	12	4.5	8 plus calls	3-4	7-8
Surgery	Surgery	Both	12	4.5	8 plus calls	3-4	8
Pediatrics	Pediatrics	Both	8	4.5	8 plus calls	3-4	6
Obstetrics & Gynecology	Obstetrics & Gynecology	Both	8	4.5	8 plus calls	4 Obstetrics 3-4 Gynecology	8 8
Psychiatry	Psychiatry	Both	8	3	8	2	4
Neurology	Neurology	Both	8	3	8	3	6

All third year clerkships are scheduled as block assignments. The student's educational attention and responsibility are focused almost completely on his current clinical clerkship assignment throughout the week, with the single exception of one-half day of lectures for the entire class weekly.

THIRD YEAR (Other than Clerkship)

Course Number	Subject	Department	Number of Lecture Hours	Total
104	Internal Medicine	Medicine	24	24
120	Pediatrics	Pediatrics	24	24
129	General Surgery	Surgery	12	12
120	Obstetrics & Gynecology	Obstetrics & Gynecology	48	48
101	Neurology	Neurology	48	48
123	Dermatology	Dermatology	24	24
100	Ophthalmology	Ophthalmology	24	24
127	Neurosurgery	Neurosurgery	11	11
173	Urology	Surgery	11	11
122	Orthopedic Surgery	Orthopedic Surgery	11	11

FOURTH YEAR

There are no formal, required lecture hours in the fourth year program. The fourth year is now entirely elective along a pathway selected with the frequent advice and consultation of a faculty adviser.

THE NEW MEDICAL SCHOOL CURRICULUM

At the end of 1968 the Executive Faculty of the Medical School approved a new curriculum to be implemented starting September, 1969. This approval followed several years of intensive planning by faculty and students under the auspices of the Educational Policy Committee of the Executive Faculty.

Because of the explosion in medical knowledge, the public demand for better medical care, the changes in postgraduate training which dictate that all physicians specialize, and the importance of developing student attitudes which are conducive to the improvement of the medical profession and of health care delivery, the Educational Policy Committee formulated certain goals to be satisfied in the new curriculum.

Goal of FLEXIBILITY

To achieve this goal, a three-fold approach has been incorporated: 1) the curriculum will consist of a core of basic medical and clinical science knowledge constituting a part of the medical education of all physicians. It will be followed by continued study and training along "tracks" planned by the student and his advisor from elective offerings related to the student's individual interest; 2) elective courses will be taken concurrently with the later quarters of the core curriculum; 3) selected students will be given the option of completing medical school in three calendar years.

Goal of STUDENT AS LEARNER

To achieve this goal, provision has been made for the student to involve himself early in his student career by selecting certain experiences, such as those relating to the early introduction to the patient, on an optional basis. Later, in Phase B he must not only select a certain minimum number of elective offerings but must to a great extent plan and structure his day to maximize his opportunities for studying and learning. In Phase D,

the student must select and develop a program within a track.

Goal of RELEVANCE

Relevance (a traceable, significant logical connection) of the medical education to the ultimate goal of patient care will be dramatized in the experiences in the introduction to the patient where clinical problems in a variety of settings will be shown to students from the very start of their medical education. Relevance and importance of the basic medical sciences to clinical medicine will be built into the basic-clinical correlations used as examples in Phase A, in interdisciplinary teaching sections in Phase B, and by including basic science electives in Phase D.

Goal of IMPROVED COMMUNICATION AMONG FACULTY AND BETWEEN FACULTY AND STUDENT

The most powerful mechanism for bringing the faculty together and improving communication between individuals with similar interest in several departments will be the teaching section method of curriculum planning and presentation in Phase B. The establishment of an effective advisor system will help to bridge the gap between student and faculty.

Goal of PREPARATION FOR THE FUTURE OF MEDICAL PRACTICE

The revolutionary social changes in the world together with the rapid advance in science and technology make it impossible to predict the nature of medical practice in the future. The curriculum will develop in our students the desire for continuing education so that they may be prepared to administer contemporary health care.

Goal of HUMANISM IN MEDICAL PRACTICE

To this end the student will be exposed early to man and will develop an understanding of his inner psychological workings and his relationship to society. This involves early exposure to the behavioral sciences and early exposure to patients in a setting which places emphasis on an understanding of their human problems.

GENERAL DESCRIPTION OF THE CURRICULUM

The curriculum for the Doctor of Medicine degree is to be organized into a core program for all students composed of a Phase A of 3 academic quarters and a Phase B of 5 academic quarters in length. On completion of this core program, the student is to begin an individualized program ("pathway" or "track") which will be 3 academic quarters or 5 academic quarters in length, depending on the span of the student's entire program. The standard curriculum for the degree of Doctor of Medicine will be 13 academic quarters, to be completed in less than 4 calendar years. Students will be considered, at their request, for completion of work for the M.D. degree in 11 academic quarters in less than 3 calendar years with the stipulation that the internship will be taken at a University or a major affiliated teaching hospital.

Phase A

Phase A is planned for three academic quarters beginning in the fall. The major emphasis of the Phase A curriculum is a presentation of a core of material in five basic medical sciences, anatomy, biochemistry, physiology, microbiology and general pathology. In addition, there will be courses titled Introudction to the Patient and Behavioral Science. The content of the quarters will be as follows:

		Hours/10 wk. qtr.
Fall --	Biochemistry	80
	Embryology	20
	Gross Anatomy (incl. introduction to Neuroanatomy)	105
	Histology	50
	Introduction to the Patient	40
	Behavorial Science	20
		315 (31.5 hrs./wk.)
Winter --	Biochemistry	60
	Embryology	20
	Gross Anatomy	105
	Histology	50
	Introduction to the Patient	40
	Behavioral Science	40
		315 (31.5 hrs./wk.)
Spring --	Introduction to the Patient	40
	Microbiology	120
	Pathology (General) - 1st five weeks	48
	Physiology	120
	Behavorial Science - last five weeks	10
		338 (34 hrs./wk.)

Since Phase A is due to be implemented in September, 1969, the necessary organization of the course schedule and curriculum is proceeding quickly. A recent report of the Phase A subcommittee outlining some specific plans for this Phase follows:

UNIVERSITY OF MINNESOTA
MEDICAL SCHOOL

Subcommittee on Phase A

Assignment to the Subcommittee

The Subcommittee on Phase A was requested to study, develop, and propose a curriculum outline for the first phase of a medical educational program in the direction and spirit broadly suggested for Phase A--Introduction to Human Biology, as derived from discussions at the fall 1967 retreat of the Medical School Executive Faculty.

Working Objectives for Development of Phase A Curriculum

1. Phase A, the first of three inter-related stages in a medical "core" curriculum, should include presentation of a core program in the anatomical sciences, human physiology, fundamental biochemistry, and basic microbiology. Ideally, a common core program presents the minimum, essential, but adequate knowledge, both factual and conceptual, necessary for initial mastery and comprehension by every medical student, regardless of his eventual future professional direction or specialty.

2. Phase A should incorporate, wherever feasible and advantageous, correlation and integration of subject matter among logically related basic disciplines.

3. Phase A, in concentrating on fundamental information and concepts of human biology, should be consolidated and abbreviated into no more than a single academic year.

4. Courses in Phase A should accomplish reduction or elimination of any existing unnecessary overlap or duplication in subject matter coverage.

5. The Phase A curriculum should be planned in a manner to encourage and generate coordination and communication between basic medical sciences and relevant clinical fields.

6. Phase A should contribute in any effective, feasible way toward significant reduction in the total time span of medical education.

7. Early in the Phase A curriculum, future physicians should be introduced to and involved meaningfully with people having medical problems which can be effectively correlated with students' current learning in basic medical sciences. "He (the student) needs to be active in his area of concern and future responsibility, namely, in the care of people" (Cope, Oliver. Man, Mind, and Medicine, 1968).

8. In Phase A, medical students must be provided a broader and more thorough introduction to the relevant subject matter and tools of behavioral disciplines, in order that they might have a more solid, relevant foundation for future dealing with personal, social, cultural, and economic aspects of patient problems.

Note: The above statements express only certain specific objectives basic

to the subcommittee's development of the Phase A segment of the curriculum. Assumed but not stated explicitly here are other, more general and inclusive objectives for the entire medical educational program.

Implementation of Objectives in Proposed Phase A Curriculum

1. There has been a careful selectivity exercised in weighing and pruning subject matter to be presented in Phase A core, not merely a redistribution and reduction of total credits and clock hours assigned.

2. Three major anatomical sciences -- gross anatomy, embryology, and histology -- have been placed in direct relation to each other toward facilitation of effective and more complete integration of their common subject matter. Basic neurological sciences have also been closely correlated and interdigitated. Biochemistry and physiology have moved toward greater complimentarily of topics in their curriculum.

3. Core physiology and microbiology, at least the basic introductory aspects, have been transferred forward from the second year into Phase A core. Corresponsingly, it is assumed that certain aspects of basic science material will be included in the integrated systemic courses and topics of Phase B.

4. A major block of time, one half day weekly, has been designated for presentation of a new challenging program on "Introduction to Clinical Medicine and the Patient", intended to involve the embryonic physician in his own synthesis and correlation of basic sciences with clinical applications and in direct, personal confrontation with human illness and patient care.

5. Provision has been made for a substantial expansion of student attention to pertinent areas of behavioral disciplines as they contribute to and find application in medicine.

6. All proposed courses in Phase A are structured to present a major impact and to require extensive student commitment. Formerly minor allocations of teaching time (as isolated one-credit courses) have been incorporated into larger, major course programs.

PHASE A

Fall

Hour	Monday	Tuesday		Wednesday	Thursday		Friday	Saturday
I		Histology		Behav Science	Histology			Introduction
II		Histo	Bio-	Behav Sci Gr	Bio-	Histo		to
III		Lab	chem		chem	Lab		Clinical
IV	Biochem	A	Lab B	Biochem	Lab A	B	Biochem	Medicine
V								
VI	Gross Anat	Embryology		Gross Anat	Embryology		Gross Anat	
VII	Gross	Biochem		Gross	Biochem		Gross	
VIII	Anat			Anat			Anat	
IX	Lab			Lab			Lab	

Hours in class = 31.5
Free time = 13.5 - 44

PHASE A

Winter

Hour	Monday	Tuesday		Wednesday	Thursday		Friday	Saturday
I		Histology		Behav Science	Histology		Behav Science	Introduction
II		Histo	Bio-	Behav Sci Gr	Bio-	Histo	Behav Sci Gr	to
III		Lab	chem		chem	Lab		Clinical
IV	Biochem	A	Lab B	Biochem	Lab A	B	Biochem	Medicine
V								
VI	Gross Anat	Embryology		Gross Anat	Embryology		Gross Anat	
VII	Gross			Gross			Gross	
VIII	Anat			Anat			Anat	
IX	Lab			Lab			Lab	

Hours in class = 31.5
Free time = 13.5 -44

PHASE A

Spring

Hour	Monday		Tuesday		Wednesday		Thursday		Friday		Saturday
I	Physiol		Physiol		Physiol		Physiol		Physiol		Physiol
II	Microbiol		Microbiol		Microbiol		Microbiol		Microbiol		Introduction
III	Micro-		Path*		Path*	Micro	Path*		Microbiol		to
IV	biol		Phys		Lab	biol		Phys			Clinical
V	A		Lab		A	Lab B		Lab			Medicine
VI	Path*		A		Microbiol			B	Path*		
VII	Path*	Micro-	Phys		Micro-	Path*		Phys		Path*	
VIII	Lab	biol	Lab		biol	Lab		Lab		Lab	
IX	A	Lab B	A		Lab A	B		B		B	

Ave. hours in class = 34
Free time = 10 - 44

* No pathology or lab last 5 weeks (Last 5 weeks scheduled by neuropsychiatry for 2 hours on Friday p.m. for clinical demonstrations).

Phase B

Phase B is planned for five academic quarters beginning in the summer (the first quarter of the proposed Phase B would first be taught in summer, 1970). The Phase B curriculum will consist of a presentation of a core of material related to 16 organs, systems and topics which will be organized and presented by interdepartmental sections with emphasis on pathophysiology and general and basic concepts. Within Phase B, the student will continue his study of the behavior of man, will learn about the approach to clinical problem solving and begin to perfect his clinical skills on hospital and clinic patients. With the counsel of an advisor, he will choose some elective work which fits his developing interests.

The approximate order of presentation of the parts of Phase B is as follows (there is some overlap between quarters):

	Sections	Approximate Hours
Summer (B_1)	Student as Physician	69
	Basic Pharmacology	43
	Cardiovascular	22
	Blood I	32
	Respiratory	22
	Behavior of Man	20
	Renal	25
		Total - 233

Student as Physician There is a concentration of lectures and clinical work in the first three weeks to provide an introduction to the approach to the patient, history taking, and physical diagnosis. This is followed by nearly three quarters (B_1, B_2, B_3) during which the student is assigned three hours per week (two hours for patient evaluation, one hour for tutorial) and two quarters (B_4 and B_5) with 6 and 9 hours per week respectively.

Within this entire large section, which represents nearly one-third of the scheduled hours in Phase B, the student will not only learn the essential skills necessary to begin to study patients but will be guided through clinical problem solving experiences on patients of all ages, including neonatal patients with various medical, surgical and obstetrical conditions. It is anticipated that very detailed planning of this section will be essential in order to provide the right kind of clinical experiences in some relation to the organs and systems under study at that time, in order to effectively weave in knowledge and appreciation of the importance of the X-ray and the clinical laboratory (including personal experience with certain common laboratory examinations) and in order to control the quality of the tutorial experiences.

Basic pharmacology The lectures are to be given during the first month of Phase B. Laboratory sessions are placed within several quarters of Phase B to provide maximum possibility for correlation of laboratory demonstrations with the organ, system sections. Some experiments will be designed to illustrate important principles of biometry.

Cardiovascular, Respiratory, Renal These systems to be studied during the first quarter of Phase B might be presented in a series of lectures or conferences over a one month span or longer, depending on the requirements of each teaching section.

Here is an example of one week planned by the Cardiovascular Section:

Monday: Embryology of the Cardiovascular System

Normal development (Anatomy)

Abnormal development (Pathology)

Tuesday: Anatomy, physiology of left to right and right to left shunts

Patient presentation (Medicine/Pediatrics)

Pathologic anatomy (Pathology)

Physiology (Medicine/Pediatrics)

Treatment (Medicine/Pediatrics and Surgery)

Wednesday: Acute rheumatic fever

Pathogenesis, diagnosis (Pediatrics)

Prevention (Pediatrics)

Treatment (Medicine/Pediatrics)

Thursday: Common Valvar Lesions

Anatomy (Pathology)

Physiology (Medicine)

Friday: Bacterial Endocarditis

Acute, subacute (Medicine/Pediatrics)

Bacteriology (Microbiology)

Prevention, treatment (Pharmacology and Medicine)

To study and prepare himself in each of the topics covered and on the Cardiovascular section in general, the student would be expected to review the appropriate basic medical science subjects (in this instance anatomy and physiology) and to consult textbook and selected references for material on pathology, pathophysiology and clinical medicine. He would be expected to study slides, museum specimens and other material in pathology. Faculty instructors will be available, on schedule as needs dictate, in pathology

laboratories and clinical areas. The student will be encouraged to consult the learning center for additional material to aid him in his studies.

Basic medical science - clinical science seminar Each of the teaching sections has been assigned two hours for a seminar to highlight a problem with important basic and clinical science ramifications. An example of such a seminar in the cardiovascular section might be endocarditis. With a group of 15, a microbiologist (or pathologist) and an internist (or pediatrician) would lead the discussion (of this prepared group of students). The range of subjects might be from rheumatic to pneumococcal, basic and clinical. The objective would be to stimulate, to involve, to tie together, with no attempt to cover.

Blood I This section includes presentations on body water, electrolytes and osmotic relationships, plasma proteins, immunoglobulins and acid base balance, among others.

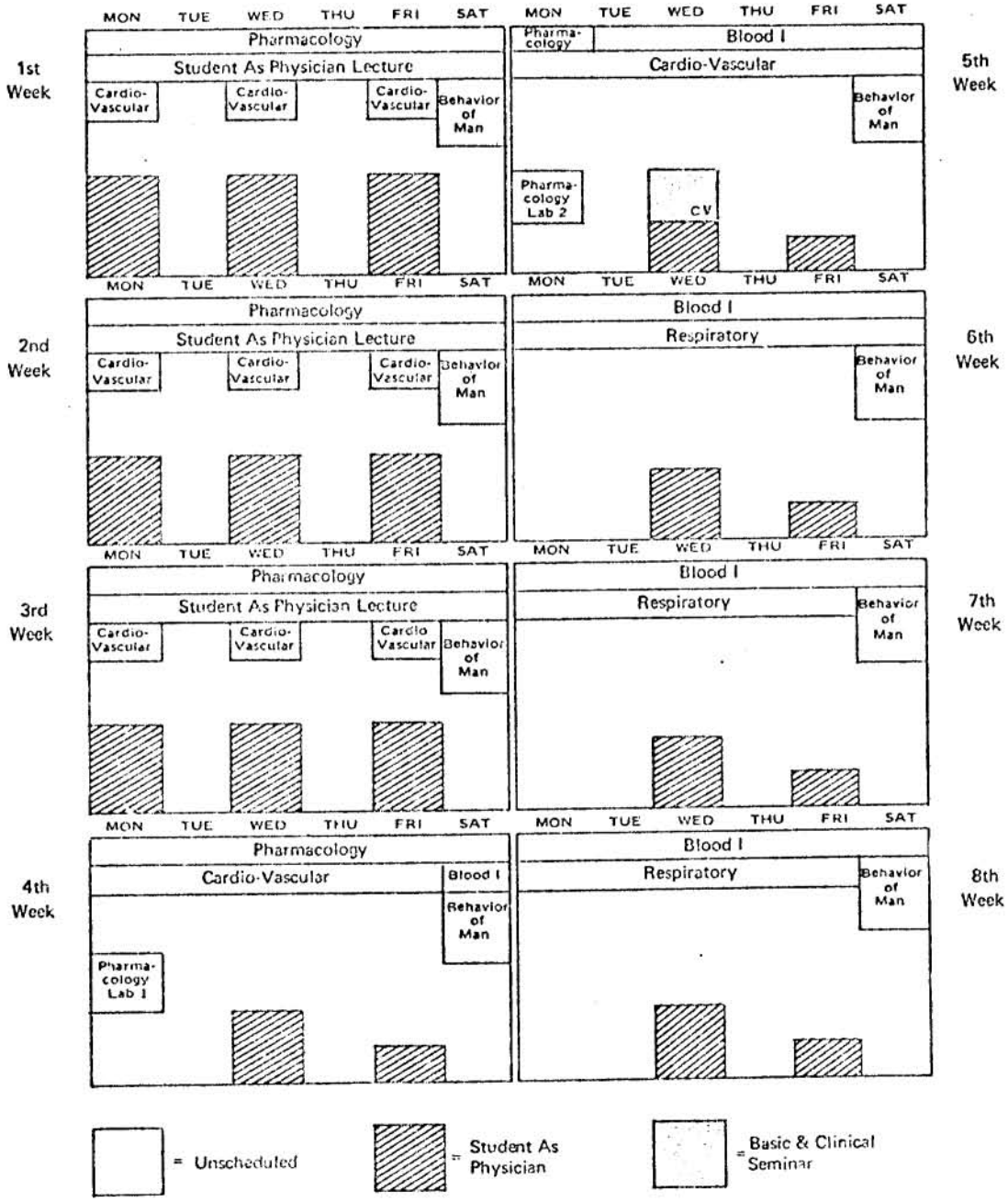
Behavior of Man Within Phase B, this will be a continuation of the blend of didactic presentations of important concepts in behavioral science and psychiatry and group discussion which would be generated from such lecture (or reading) material or from clinical experiences or problems of those in the group or from current topics of interest.

On the next page is an example of how the first 8 weeks of this quarter might be organized.

PHASE B
(Sophomore Year)

TYPICAL 8-WEEK CLASS SCHEDULE

Showing Scheduled Periods and Unscheduled Periods



	Sections	Approximate Hours
Fall (B_2)	Man in his Community	20
	Endocrine and Metabolism	45
	Reproduction including an introduction to Obstetrics	33
	Student as Physician	33
	Behavior of Man	20
	Electives	22
		Total - 172

Man in his Community This section set as its goals to introduce broad concepts of health maintenance and stress the significance of these as utilized in daily patient care, to introduce broad concepts of management of illness and to enable the student to be better able to assess significance of conclusions and effectively utilize this in medical decision making. The focus of this section, then, will be the patient, at risk, and the inter-relationship between physician and his patient. The section will include an outline of the health hazard appraisal system, an introduction to biometry and statistical decision making in medicine, environmental health and epidemiology with emphasis on the individual patient, psycho-social aspects in high risk groups, and health care systems.

Electives In the B_2 through B_5 quarters, the number of class hours for electives represents a minimum for each student. Electives may be developed by interdisciplinary teaching sections, by departments and divisions or by interested interdepartmental groups. This will furnish the opportunity for those sections, departments and others whose core course is only a part of a more intensive didactic program to provide a more elaborate presentation in greater depth. Examples of electives which might be selected in this quarter: Advanced cardiovascular (or respiratory or renal) seminar, topics in electrolyte metabolism, introduction to genetics, the X-ray examination

	Sections	Approximate Hours
Winter (B_3)	Gut	35
	Blood II	22
	Behavior of Man	20
	Man in His Community	22
	Student as Physician	33
	Ear-nose-throat, speech and hearing	19
	Electives	22
		Total - 173

Blood II This section is what has been called hematology in the past and will include material on red cells, leukocytes, lymph nodes and spleen and aspects of immunobiology.

	Sections	Approximate Hours
Spring (B_4)	Neurological Sciences	86
	Student as Physician	66
	Eye	12
	Skin	17
	Electives	33
		Total - 214

Neurological Sciences This teaching section includes most of neuroanatomy, approximately one half of the total curriculum time alloted to neurophysiology (the other half being in core physiology in Phase A) as well as the clinical neurological sciences core material, including neurology, neurosurgery and neuropathology.

	Sections	Approximate Hours
Summer (B_5)	Student as Physician	99
	Bones, Connective Tissue, Trauma	39
	Electives	33
		Total - 171

Breakdown by quarters	Su 233/484	=	48%
	F 172/484	=	36%
	W 173/484	=	35%
	S 214/484	=	44%
	Su 171/484	=	36%

Phase C

The Phase C Subcommittee after due deliberation, and following consultation with the Phase D Subcommittee, evolved a two-quarter segment that would include a core, of approximately one quarter, during which the student would be introduced to the special aspects of history taking, physical diagnosis and overall introduction to surgical patients, including all of the specialties plus Obstetrics and Gynecology.

Meanwhile, proceeding independently, Phase B Subcommittee decided that clinical problem solving both for hospitalized and ambulatory patients should be an integral part of Student as Physician. This section was to place a strong emphasis on tutorial work, specifically directed reading, and scholarly analysis of the role of laboratory diagnostic procedures, including radiological approaches to biological problem solving. They anticipated that the student would have an opportunity for studying in detail approximately sixty patients on various clinical services. Indeed, they propose that this represents, essentially, core clinical introductory material. It is concluded by the Educational Policy Committee that this continuum in B will suitably replace the intent of the Phase C Subcommittee introductory quarter. Therefore, Phase C as re-constituted will be utilized for other educational purposes. In regular 3 year and 4 year programs where all five quarters of Phase B are taken without interruption, only symbols B and D will be used. In special programs, almost all of which will of necessity be the 4 year type, the symbols C_1 and C_2 may be used to represent quarters which are not fully elective (D) nor completely identical with a quarter in Phase B.

Phase D

In Phase D, the student, with the help of his advisor, will embark on an elective program of study in one of six career pathways. These pathways are the following

1) Medicine, Pediatrics and Medical Specialties
2) Surgery and Surgical Specialties including Obstetrics and Gynecology
3) Psychiatry and Behavioral Sciences
4) Neurological Sciences
5) Family Medicine, Family Practice and Community Health
6) Medical Science

None of the pathways will contain mandatory requirements but each student will be urged to include at least twelve credits of basic science subjects in his program. The opportunity to return to basic science subjects after some exposure to clinical medicine is one of the attractive features of Phase D.

The length of Phase D will vary depending upon whether the student is on a three-year or a four-year plan. In the three-year plan, there will be three quarters of Phase D and either four or five quarters of D will be included in the four-year program.

A thesis on a research subject or defense of some proposition in the area of specialty will be a part of the requirement for completion of Phase D for each student.

Each pathway will be under the supervision of a review committee made up of the faculty involved in the pathway and including at least one member of a basic science faculty in each committee. The committees, which will

also have representation from the student body and from the junior faculty, will be appointed by the Educational Policy Committee and will have the responsibility of reviewing and approving each student's program on the specific pathway.

Example of a four-quarter program for a student in the Medicine, Pediatrics, and Medical Specialties track, with an interest in cardiovascular medicine is the following: sub-internship in Medicine - 12 weeks; Pharmacology and Physiology - 12 weeks; Clinical Cardiology and Electrocardiography - 12 weeks; Diagnostic Radiology (Cardiovascular) - 6 weeks; Cardiovascular and Special Pathology - 6 weeks.

An exemplary program for a student embarked upon the three-year curriculum in a Medicine, Pediatric and Medical Specialty pathway may be the following: Medical Clerkship - 6 weeks; Pediatrics Clerkship - 6 weeks; Psychiatry and Neurology Clerkship - 6 weeks; General Surgical Clerkship - 6 weeks; Biochemistry and Physiology - 12 weeks.

PHASE D

The present senior year is a prototype of the type of courses which will be offered in Phase D. A special course list outlining the breadth of the elective courses, chosen by the student and his advisor follows:

Department	Course Number	Course Title	Minimum Block Time Weeks
ANATOMY	Anat. 5-190	Advanced Anatomy	12
ANESTHESIOLOGY	Anes. 5-169	Research	6
	Anes. 5-181	Externship in Clinical Practice of Anesthesiology	3
	Anes. 5-182	Externship in Anesthesiology & Respiratory Problems (prereq. 5-181)	3
BIOCHEMISTRY	MdBc 8-200	Seminar	--
	MdBc 8-300	Research	12
	MdBc 8-206	Endocrinology and Steroid Chemistry	--
	MdBc 8-210	Metabolic Enzymology	--
	MdBc 8-211	Nucleic Acid Structure & Function	--
DERMATOLOGY	Derm. 5-182	Clinical Probelms in Derm.	3
	Derm. 5-183	Advanced Course in Derm.	3
FAMILY PRACTICE & COMMUNITY HEALTH	FPCH 5-500	Externship in Clinical Practice	6
HISTORY OF MEDICINE	HMed. 5-400	History of Medicine	--
	HMed. 5-401	History of Medicine	--
	HMed. 5-402	History of Medicine	--
	HMed. 5-410	Seminar	--

Department	Course Number	Course Title	Minimum Block Time Weeks
HISTORY OF MEDICINE (Con't.)	HMed. 5-411	Seminar	--
	HMed. 5-412	Seminar	--
LABORATORY MEDICINE	LMed 5-181	Laboratory and Clinical Hematology	6
	LMed 5-182	Medical Genetics	6
	LMed 5-183	Clinical and Laboratory Immunology	6
	LMed 5-184	Immunohematology in Blood Banking	3
	LMed 5-185	Laboratory Problems in Blood Coagulation	3
	LMed 5-186	Clinical Pathology Externship - HCGH	6
	LMed 5-187	Clinical Pathology Externship - Mt. Sinai	6
	LMed 5-188	Clinical Pathology Externship - Methodist Hospital	6
	LMed 5-189	Clinical Blood Bank Immunology	6
	LMed 5-190	Computer Applications in Laboratory Medicine	3
	LMed 5-191	General Clinical Microbiology	3 or 6
	LMed 5-192	Antibiotic Teaching Unit	3
	LMed 5-193	Clinical Pathology Externship at Hibbing General Hospital	3
	LMed 5-765	Hematology - blood and blood forming organs (Lecture series)	--
	LMed 5-766	Hematology - blood and bone marrow diagnosis (lecture series, pre req. LMed 5-765)	--
MEDICINE	Med 5-501	Medical Oncology Externship in Medicine at Univ. Hosp.	6
	Med 5-502	Medical Externship at V.A. Hospital	6

Department	Course Number	Course Title	Minimum Block Time Weeks
MEDICINE (con't.)	Med. 5-503	Medical Externship at St. Paul Ramsey	6
	Med. 5-504	Medical Externship at Northwestern	6
	Med. 5-505	Medicine Externship at Mt. Sinai	6
	Med. 5-511	Research in Gastroenterology at University Hospital	Arr.
	Med. 5-512	Research Topics in Hematology at University Hospital	12
	Med. 5-521	Problems in Clinical Medicine at University Hospital	--
	Med. 5-522	Gastroenterology at University Hospital	6
	Med. 5-523	Metabolism and Clinical Pharmacology at Univ. Hosp.	6
	Med. 5-524	Immunology, Allergy, and Infectious Disease at University Hospital	6
	Med. 5-525	Cardiovascular Disease at University Hospital	6
	Med. 5-526	Electrocardiography at University Hospital	3
	Med. 5-527	Renal at University Hospital	3
	Med. 5-528	Clinical Hematology at University Hospital	6
	Med. 5-529	Clinical Hematology (Abbreviated) at University Hospital	3
	Med. 5-530	Seminar in Oncology at University Hospital	--
	Med. 5-541	Trends, Methodology, and Techniques in the Delivery of Medical Service at St. Paul Ramsey Hospital	--
	Med. 5-542	Hematology at St. Paul-Ramsey Hospital	6

Department	Course Number	Course Title	Minimum Block Time Weeks
MEDICINE (con't.)	Med. 5-543	Cardiology at St. Paul-Ramsey Hospital	6
	Med. 5-544	Pulmonary Disease at St. Paul-Ramsey Hospital	6
	Med. 5-551	Cardiology (EKG) at V.A. Hospital	6
	Med. 5-552	Clinical Hematology at V.A. Hospital	6
	Med. 5-553	Pulmonary Disease at V.A. Hospital	6
	Med. 5-554	Fluid, Electrolyte and Acid-Base Metabolism at V.A. Hospital	6
	Med. 5-555	Electrocardiography - V.A.H.	6
	Med. 5-561	Cardiology Service at Hennepin County General Hospital	6
	Med. 5-562	Renology Service at Hennepin County General Hospital	6
	Med. 5-563	Pulmonary Disease at Hennepin County General Hospital	6
	Med. 5-571	Medical Emergency Room at St. Paul-Ramsey Hospital	6
	Med. 5-572	Ambulatory Medicine at St. Paul-Ramsey Hospital	6
	Med. 5-573	Medical Out-Patient Clinics at Hennepin County General Hospital	6
MICROBIOLOGY	MicB 5-116	Immunology	--
	MicB 5-117	Immunology Laboratory	--
	MicB 5-121	Physiology of Bacteria	--
	MicB 5-124	Biology of Viruses	--
	MicB 5-152	Special Problems	6
	MicB 8-202	Diagnostic Microbiology	--
	MicB 8-223	Bacterial Metabolism	--

Department	Course Number	Course Title	Minimum Block Time Weeks
NEUROLOGY	Neur. 5-510	Externship in Clinical Practice - U. Hospital	6
	Neur. 5-511	Externship in Clinical Practice - SPR Hospital	6
	Neur. 5-512	Externship in Clinical Practice HCG Hospital	6
	Neur. 5-513	Externship in Clinical Practice - VA Hospital	6
	Neur. 5-120	Selected Problems in Neurology	6
	Neur. 5-540	Neurochemistry (U. Hosp.)	6
	Neur. 5-541	Neurochemistry-Pediatrics Neurology (U. Hospital)	12
	Neur. 5-544	Clinical Electroencephalography (U. Hospital)	6
	Neur. 5-545	Electromyography (U. Hosp.)	6
	Neur. 5-550	Neuropathology	3
	Neur. 5-555	Clinical Neurophysiology (SPR Hospital)	12
	Neur. 5-560	Genetics (V.A. Hospital)	6
NEUROSURGERY	NSur. 5-500	Externship at Univ. Hosp.	3
	NSur. 5-510	Externship at V.A. Hospital	3
	NSur. 5-511	Externship at Hennepin County General	3
	NSur. 5-520	Neurosurgery Investigation	6
OBSTETRICS - GYNECOLOGY	Obst. 5-500	Externship in Obstetrics	6
	Obst. 5-505	Externship in Gynecology	6
	Obst. 5-510	Externship in Obstetrics & Gynecology	6
	Obst. 5-515	Obstetrics and Gynecology Externship in Clinical Pract.	3

Department	Course Number	Course Title	Minimum Block Time Weeks
OB. & GYN. (Cont.)	Obst. 5-520	Problems in Obstetrics & Gynecology	3
	Obst. 5-540	Psychiatric Aspects of Obstetrics & Gynecology	6
	Obst. 5-560	Research in Reproduction	12
OPHTHALMOLOGY	Opth. 5-180	Externship in Ophthalmology	3
	Opth. 5-190	Ophthalmology Research Problems	12
ORTHOPEDIC SURGERY	OrSu. 5-185	Externship in Orthopedic Surgery	6
	OrSu. 5-187	Externship in Orthopedic Surgery	6
	OrSu. 5-188	Externship in Orthopedic Surgery	6
	OrSu. 5-189	Externship in Orthopedic Surgery	6
	OrSu. 5-186	Research Problems in Orthopedic Surgery	12
OTOLARYNGOLOGY	Otol 5-191	Externship in Otolaryngology	3
	Otol 5-194	Research in Otolaryngology	12
PATHOLOGY	Path 5-105	Diseases of the Kidney	--
	Path 5-106	Diseases of the Heart	--
	Path 5-112	Diagnosis of Tumors	--
	Path 5-113	Surgical Pathology	3
	Path 5-114	Surgical Pathology	3
	Path 5-115	Surgical Pathology	3
	Path 5-122	Basic Science of Cancer	--
	Path 5-150	Problems in Pathology	6
	Path 5-151	Problems in Pathology HCGH	6
	Path 5-152	Problems in Pathology VA	6
	Path 5-161	Forensic Pathology	--

Department	Course Number	Course Title	Minimum Block Time Weeks
PEDIATRICS	Peds. 5-501	Inpatient Externship at Hennepin County General Hospital	6
	Peds. 5-502	Inpatient and Outpatient Externship at Children's Hospital	12, 6 Arr.
	Peds. 5-503	Inpatient Externship at St. Paul-Ramsey	6
	Peds. 5-511	Outpatient Externship at University Hospital	6
	Peds. 5-512	Outpatient Externship at Hennepin County General Hosp.	6
	Peds. 5-513	Clinical Experience at Community-University Health Care Center	12
	Peds. 5-514	Community Pediatrics at Pilot City Health Center	6
	Peds. 5-515	Outpatient Health Care at St.Paul-Ramsey Hospital	6
	Peds. 5-516	Clinical Pediatrics at the Mayo Clinic	6
	Peds. 5-531	Neo-Infant Program	16
	Peds. 5-532	Clinical Immunology at University Hospital	6
	Peds. 5-533	Pediatrics Cardiology at the Mayo Clinic	6
	Peds. 5-534	Pediatrics Cardiology at the University Hospital	6
	Peds. 5-535	Infectious Disease	6
	Peds. 5-536	Pediatric Hematology-Oncology at University Hospital	6
	Peds. 5-537	Pediatrics Endocrinology and Metabolism at Univ. Hosp.	6
	Peds. 5-538	Endocrinology and Metabolism	30
	Peds. 5-539	Introduction to Neonatology	6
	Peds. 5-540	Pediatric Neurology at University Hospital	6

Department	Course Number	Course Title	Minimum Block Time Weeks
PEDIATRICS (Con't.)	Peds. 5-541	Pediatric Neurology at the Mayo Clinic	6
	Peds. 5-542	Clinical Pharmacology	12
	Peds. 5-543	Nephrology at the Univ. Hosp.	6
	Peds. 5-544	Pediatric Pulmonary Disease	6
	Peds. 5-545	Child Psychiatry at the Mayo Clinic	12
	Peds. 5-571	Research at Community University Health Care Center	12
	Peds. 5-572	The Prenatal Interview as a Predictor of Health Risk areas for the Child	12
	Peds. 5-573	Research in Immunocytology	12
PHARMACOLOGY	Phcl. 5-105	Forensic Medicine and Medical Jurisprudence	--
	Phcl. 5-106	Toxicology	--
	Phcl. 8-201	Advanced Pharmacology: Physiological Disposition of Drugs	--
	Phcl. 8-202	Advanced Pharmacology: Pharmacodynamics	--
	Phcl. 8-203	Research in Pharmacology	12
	Phcl. 8-204	Seminar: Selected Topics in Pharmacology	--
	Phcl. 8-206	Seminar: Psychopharmacology	--
	Phcl. 5-501	Clinical Pharmacology	--
	Phcl. 5-502	Clinical Pharmacology	Arr.
PHYSICAL MEDICINE & REHABILITATION	PMed. 5-410	Adult Rehabilitation Medicine	6
	PMed. 5-411	Pediatric Rehabilitation Medicine	6
	PMed. 5-412	Arthritis Rehabilitation	3
	PMed. 5-413	Amputation Rehabilitation	3

Department	Course Number	Course Title	Minimum Block Time Weeks
PHYS. MED. & REHAB. (Con't)	PMed. 5-414	Physical Medicine and Rehab. for the Family Physician	3
	PMed. 5-415	Psychological Aspects of Chronic Disease	--
	PMed. 5-420	Histopathology, Electordiagnosis, and Kinesiology	3
	PMed. 5-430	Research in Physical Medicine and Rehabilitation	12
PHYSIOLOGY	Phsl 5-113	Problems in Physiology	--
	Phsl 8-201	Literature Seminar	--
	Phsl 8-202	Readings in Physiology	--
	Phsl 8-203	Research in Physiology	--
	Phsl 8-210	Selected Topics in Permeability	--
	Phsl 8-213	Selected Topics in Alimentary Physiology	--
	Phsl 8-216	Selected Topics in Neurophysiology	--
	Phsl 8-220	Methods of Analysis	--
	Phsl 8-227	Methods in Physiology	--
	Phsl 8-236	Hemodynamic Measurements	--
	Phsl 8-239	Topics in Microcirculation and Lymphatics	--
PSYCHIATRY	PtrA 5-500	Externship in Adult Psychiatry at HCGH	6
	PtrA 5-501	Externship in Adult Psychiatry at St. Paul Ramsey	6
	PtrA 5-502	Externship in Adult Psychiatry at V.A. Hospital	6
	PtrA 5-503	Externship in Adult Psychiatry at Fairview and St. Mary's	6

Department	Course Number	Course Title	Minimum Block Time Weeks
PSYCHIATRY (Con't.)	PtrA 5-510	Clinical Problems in Psychiatry	12
	PtrA 5-520	Psychological Problems in Medical Practice	6
DIVISION OF CHILD PSYCHIATRY	PtrC 5-500	Externship and Clinical Practice, Child Psychiatry	6
	PtrC 5-520	Externship in Child Psychiatry	--
PUBLIC HEALTH	PubH 5-104	Epidemiology I	--
	PubH 5-105	Epidemiology II	--
	PubH 5-106	Public Health Administration	--
	PubH 5-107	Maternal and Child Health	--
	PubH 5-120	Biomedical Computing	--
	PubH 5-123	Topics in Public Health	--
	PubH 5-124	Medical Statistics II	--
	PubH 5-129	Epidemiologic Survery Methods	--
	PubH 5-134	Human Genetics and Public Health	--
	PubH 5-136	Handicapped Children	--
	PubH 5-141	Social and Economic Aspects of Medical Care	--
	PubH 5-143	Measurement and Application of Ionizing Radiation	--
	PubH 5-147	Environmental Radioactivity	--
	PubH 5-151	Health Aspects of Air Control in Hospitals	--
	PubH 5-153	Principles and Methods of Accident Prevention	--
	PubH 5-155	Introduction to the Air Pollution Problem	--
	PubH 5-157	Radiation Protection Criteria for Hospitals	--

Department	Course Number	Course Title	Minimum Block Time Weeks
PUBLIC HEALTH (cont.)	PubH 5-158	Hospital Safety	--
	PubH 5-188	Comparative Medicine and Public Health	--
	PubH 5-191	Applied Human Nutrition	--
	PubH 5-195	Public Health Aspects of Cardiovascular Disease	--
	PUBH 8-200	Research	6
	PubH 8-214	Health of the School Age Child	--
	PubH 8-238	Radiation Dosimetry	--
	PubH 8-239	Radiation Dosimetry Laboratory	--
	PubH 8-241	Epidemiology of Noncommunicable Diseases	--
RADIOLOGY	Rad. 5-500	Externship in Radiology	3
	Rad. 5-501	Externship in Radiology	3
	Rad. 5-505	Externship in Radiation Therapy	3
	Rad. 5-510	Externship in Diagnostic Radiology at University Hospital	3
	Rad. 5-511	Externship in Diagnostic Radiology at H.C.G.H.	3
	Rad. 5-512	Externship in Diagnostic Radiology at Veterans Hospital	3
	Rad. 5-530	Problems in Radiation Biology and Radioactive Isotope Methods	3
SURGERY	Surg. 5-500	Externship in Surgery at University - Transplantation and General Surgery	6
	Surg. 5-501	Externship in Surgery at University Cardiovascular and Thoracic Problems	6
	Surg. 5-502	Externship in Surgery at University	6
	Surg. 5-503	Externship in Surgery at University - Pediatrics Surgery	6
	Surg. 5-504	Externship in Surgery at University - General Surgical Problems including some Thoracic and Cardiovascular Cases	6

Department	Course Number	Course Title	Minimum Block Time Weeks
SURGERY (Cont.)	Surg. 5-510	Externship in Surgery at V. A. Hospital	6
	Surg. 5-511	Externship in Surgery at St. Paul-Ramsey	6
	Surg. 5-512	Externship in Surgery at Hennepin County General	6
	Surg. 5-513	Externship in Surgery at Mt. Sinai Hospital	6
	Surg. 5-520	Experimental Surgery	6
DIVISION OF UROLOGY	Urol. 5-180	Externship in Urology	3

Part I G Program

FAMILY PRACTICE AND COMMUNITY HEALTH

A new concept of a Family Practice and Community Health Program has been included into the new curriculum. The following outlines the objectives and plans of the Department of Family Practice and Community Health.

The Department of Family Practice and Community Health at the University of Minnesota Medical School was in its planning phase from April, 1967 through October, 1967. During that time, the decision to train an entirely new kind of physician was made, and the body of knowledge felt to be essential for this physician was developed. This is as outlined in the Report of the Subcommittee on Family Practice and Community Health of the University of Minnesota Medical School dated October, 1967. Subsequent to that time, the staff of the department has been concerned with the development of a teaching program incorporating these principles. The initial faculty of the department will consist of a nuclear staff composed of representatives of those other specialty areas in medical practice from which relevant portions of the body of knowledge of family medicine will be taken (pediatrics, internal medicine, psychiatry, obstetrics and certain of the behavioral sciences). The second increment of faculty will consist of men who have had experience in general practice who will return to the department for a period of training in family medicine. An attempt will be made to integrate those portions of the body of knowledge of family medicine from all of the other specialties in such a way that each of these men will be able to teach the new discipline to subsequent trainees. These men will comprise the subsequent faculty of the department. It is our initial plan to train about fifteen such physicians for our faculty.

During the developmental phase of this department, we have also been attending to the selection of a patient population. The criteria for our selection will be that it represent a reasonable cross section of society, both from a socioeconomic viewpoint and also from an age viewpoint. We are developing a prepaid insurance plan for this patient population.

The department is developing as a free-standing department within the Medical School. It will see its patients in an ambulatory care area within the University Hospitals and when patients need hospital admission, they will be admitted on the hospital service of the Department of Family Practice and Community Health. The responsibility for inpatient care will remain with the same resident who has outpatient responsibilities for that patient.

We are also in the process of developing affiliated units, both in the metropolitan area of the Twin Cities and in rural portions of the state. As we develop our faculty, some of them will be given the responsibility of development of these affiliated units.

Our educational program will involve the undergraduate medical student at all stages of his training in addition to the above-described resident training program. This will be effected through the mechanism of giving the trainee progressively increasing increments of responsibility in direct patient care. There will also be made available to him opportunities for interaction with the faculty through the mechanism of conferences, seminars, etc. Certain didactic course work will be available to him within the entire University Program.

Since one of our goals is to train physicians to be more effective in delivery of total health care, every effort will be made to apprise the trainee of the

multiple resources available to him in his practice and to make him knowledgeable of their proper application. Because we regard this as an important goal, we plan to have many of these resources available to the trainee when he is engaging in direct patient care.

Our research program will develop in areas of health care maintenance, education, natural history of disease, etc.

Dictated by B. F. Fuller, M.D., Professor and Chairman, Department of Family Practice and Community Health.

CURRICULUM EVALUATION

The Educational Policy Committee and its several, established review subcommittees provide ongoing study of the curriculum. Members of the Medical School student body serve on these committees.

The students of the Medical School have played a significant role in the establishment of the new Medical School curriculum. In addition, the students provide continual critiques of departmental curricula and the individual courses.

DEPARTMENTAL TEACHING PROGRAMS
1968-69

The following tabulations include Medical School department descriptions and current course offerings; including both undergraduate and graduate disciplines.

Department of Anatomy: The courses in the department provide an opportunity for examining the structure of the human body. In gross anatomy, three-dimensional architecture and relationships to other organs are studied by dissection. In microscopic anatomy, the organization of cells, tissues, and organs is assessed from stained sections using light microscopy and electron micrographs. For each system, in embryology, the normal development and anomalies are presented using preserved specimens and models. Special emphasis is given to neurocytology and neurochemistry in neuroanatomy. Where appropriate, the courses are correlated with the various clinical disciplines. Thus the student may enhance his powers of observation, his ability to communicate using specific terminology, and his synthesis of morphology with biochemistry and physiology. More depth in any of the subjects can be obtained through advanced course work on elective time.

Undergraduate Courses:

Medical:
- Gross Human Anatomy (101f-101w)
- Human Histology (103f-104s)
- Human Embryology (107w)
- Neuroanatomy (111s)
- Advanced Anatomy (190) - Elective

Dental:
- Microscopic (105)
- Gross Anatomy (108-109)
- Neuroanatomy (110)

Others:
- Elementary Anatomy (Anat 3)
- Elementary Anatomy (Anat 4)
- Anatomy for Physical Education (Anat 27)
- Anatomy for Mortuary Science (Anat 52)
- Anatomy for Physical Therapy & Occupational Therapy (Anat 58)
- Anatomy for Medical Technologists (Anat 165)
- Anatomy for Medical Technologists (Anat 166)

Department of Anatomy - Continued

Graduate Courses:
- Advanced Anatomy
- Special Research in Anatomy
- Electron Microscopy
- Anatomy Seminar
- Gross Anatomy (100-101)
- Human Histology (103-104)
- Embryology (107)
- Medical Neuroanatomy (111)

Department of Biochemistry: Biochemistry occupies a central position in all medical science and in clinical medicine. The required course first deals with general biochemistry and treats the chemical transformations fundamental to life processes occurring at the cellular and subcellular levels. A major emphasis is on the integration of biochemical processes and on the regulation and coordination of the metabolic reactions. Biochemical abnormalities in disease are employed to fortify the understanding of the normal processes and to indicate the application of biochemical principles to future studies of disease processes.

Undergraduate Courses:

Medical:
- Biochemistry (100-101w)
- Seminar (MdBc 8-200) - Elective
- Research (MdBc 8-300) - Elective
- Endocrinology and Steroid Chemistry (MdBc 8-206) - Elective
- Metabolic Enzymology (MdBc 8-210) - Elective
- Nucleic Acid Structure & Function (MdBc 8-211) - Elective

Dental:
- Biochemistry (104f)
- Biochemistry (105w)

Others:
- Metabolic Enzymology (210w)
- Topics in Lipid Chemistry (215su)
- Protein Chemistry (217w)
- Biochemistry of Specialized Tissues (219f)
- Biochemistry (30f)
- Biochemistry (50f)
- Biochemistry (106f)
- Biochemistry (107w)

Department of Biochemistry - Continued

Graduate Courses:

Problems in Biochemistry (153 f,w,s,su)
Laboratory Work in Isolation & Characterization of Natural Products & in Metabolic Processes (147s)
Advanced Endocrinology & Steroid Chemistry (206f)
Nucleic Acid Structure & Function (211s)
Radioisotope Seminar (236 f,w,s)
Tutorial & Problems (153 f,w,s)
Biochemistry (141f, 142w, 143s)
Laboratory for Graduate Students (147s)
Endocrinology (206f)
Enzymology (210w)
Nucleic Acids (211s)
Lipid Metabolism (215su)
Protein Chemistry (217w)
Research (205 f,w,s,su)
Seminar (200 f,w,s)
Biochemistry (100su, & 101 su)
Biochemistry Specialized Tissues (219f)
Biochemistry (102f)
Biochemistry (103w)

Department of Microbiology: Microbiology for medical students educates the future practicing physician in the principles and techniques which help to understand host-parasite relationships and pathogenesis in infectious diseases. The application of modern microbiology to medical diagnosis guides the future physician in the treatment and prevention of infectious diseases and in the use of chemotherapeutic and antibiotic agents.

In the lecture portion of the course, experts in each area review current research and basic principles in medical bacteriology, immunology, mycology, and virology. Through intensive laboratory experience the future clinician is trained to interpret laboratory results as well as to appreciate his role in, and the need for, cooperation between the modern physician and the diagnostic laboratory.

Undergraduate Courses:

Medical:

Microbiology for Medical Students (205 & 206)
Immunology (MicB 5-116) - Elective
Immunology Laboratory (MicB 5-117) - Elective

Department of Microbiology - Continued

Undergraduate Courses:

Medical: (Contd.)
- Physiology of Bacteria (MicB 5-121) - Elective
- Biology of Viruses (MicB 5-124) - Elective
- Special Problems (MicB 5-152) - Elective
- Diagnostic Microbiology (MicB 8-202) - Elective
- Bacterial Metabolism (MicB 8-223) - Elective

Dental:
- Microbiology for Dental Students (5-201)

Others:
- Elementary Microbiology (1-101)
- General Microbiology (3-103)
- Medical Microbiology (5-232)
- Clinical Microbiology (5-233)
- Special Problems (5-970)
- Biology of Microorganisms (5-105)

Graduate Courses:

- Ecology of Soil Microorganisms (5-612)
- Microbial Genetics (5-311)
- Advanced Microbiology (5-611)
- General Mycology (5-512)
- Immunology (5-216) and Immunology Laboratory (5-217)
- Physiology of Bacteria (5-321)
- Biology of Viruses (5-424)
- Research in Microbiology (8-990)
- Diagnostic Microbiology (8-242)
- Seminar (8-910)
- Advances in Immunology (8-920)
- Laboratory Methods (8-425)
- Advanced Medical Microbiology (8-234)
- Physiology of Bacteria Laboratory (8-322)
- Bacterial Metabolism (8-332)
- Immunobiology & Immunochemistry (8-218)

Department of Pathology: The morphologic changes in organs and tissues which occur in disease are the subject of the courses in Pathology. In lectures, demonstrations, and laboratory study the student is presented the basic reactions of the body to various kinds of injury and also the special types of reactions of various organs and organ systems to specific types of injurious agents. Opportunities are offered to those students who wish to continue their study of pathology beyond the regular courses either by taking elective courses or by engaging in research projects.

Department of Pathology - Continued

Undergraduate Courses:

Medical:

General Pathology (Path 101)
Special Pathology (Path 102)
Diseases of the Kidney (Path 5-105) - Elective
Diseases of the Heart (Path 5-106) - Elective
Diagnosis of Tumors (Path 5-112) - Elective
Surgical Pathology (Path 5-113) - Elective
Surgical Pathology (Path 5-114) - Elective
Surgical Pathology (Path 5-115) - Elective
Basic Science of Cancer (Path 5-122) - Elective
Problems in Pathology (Path 5-150) - Elective
Problems in Pathology Hennepin County General Hospital (Path 5-151) - Elective
Problems in Pathology Veterans Administration Hospital (Path 5-152) - Elective
Forensic Pathology (Path 5-161) - Elective

Dental:

Pathology for Dental Students (Path 100)

Others:

Pathology for Mortuary Science Students (Path 53)
Pathology for Mortuary Science Students (Path 54)
Pathology for Physical Therapists (Path 60)

Graduate Courses:

Autopsies (Path 104)
Seminar (Path 110)
Conference on Autopsies (Path 111)
Seminar: Experimental Pathology (Path 140)
Problems in Experimental Pathology (Path 141)
Research (Path 201)

Department of Pharmacology: The purpose of the medical courses in pharmacology is to provide students with a fundamental understanding, in depth, of underlying principles upon which rational therapy is based. Emphasis is placed on mechanism of action, absorption, distribution, biotransformation, and excretion of drugs both in general and in specific terms. Laboratories and therapeutic conferences are included as adjuncts to lectures so that actions of drugs in health and disease can be illustrated. During the clinical experiences, clinical pharmacologists attempt to show by means of ward rounds and clinical conferences how principles of pharmacology are applied for treatment of disease in patients.

Department of Pharmacology - Continued

Undergraduate Courses:

Medical:

General Pharmacology (103, 104)
Forensic Medicine, Medical Jurisprudence (105) - Elective
Problems (109)
Advanced Pharmacology: Pharmacodynamics (202) - Elective
Clinical Pharmacology: Lectures on General Principles (207)
Clinical Pharmacology: Participation in Clinical and Laboratory Studies (208)
Toxicology (Phcl. 5-106) - Elective
Advanced Pharmacology: Physiological Disposition of Drugs (Phcl. 8-201) - Elective
Research in Pharmacology (Phcl. 8-203) - Elective
Seminar: Selected Topics in Pharmacology (Phcl. 8-204) - Elective
Seminar: Psychopharmacology (Phcl. 8-206) - Elective
Clinical Pharmacology (Phcl. 5-501) - Elective
Clinical Pharmacology (Phcl. 5-502) - Elective

Dental:

Dental Therapeutics (108)
General Pharmacology (102)
Dental Therapeutics (1)

Others:

Pharmacology for Nursing Students (9)
General Pharmacology (102)
Toxicology (106)
Biological Assay of Drugs (162)

Graduate Courses:

General Pharmacology (103, 104)
Toxicology (106)
Pharmacometrics (107)
Problems (109)
Advanced Pharmacology: Physiological Disposition of Drugs (201)
Advanced Pharmacology: Pharmacodynamics (202)
Research in Pharmacology (203)
Seminar: Selected Topics in Pharmacology (204)
Seminar: Survey of Current Pharmacological Literature (205)
Seminar: Psychopharmacology (206)
Clinical Pharmacology: Lectures on General Principles (207)

Department of Physiology: Provides courses in human physiology; hemodynamic measurements; history of physiology; topics of permeability, heart and circulation, respiration, neurophysiology, microcirculation; methods of analysis; transport processes; respiration, acid base and electrolyte physiology; bioenergetics of cardiac contraction, renal hemodynamics; biophysics of nerve function; neural and humoral control of circulation.

Department of Physiology - Continued

Undergraduate Courses:

Medical:

Human Physiology (106-107)
Hemodynamic Measurements (Phsl 112) - Elective
Problems in Physiology (Phsl 113) - Elective
Readings in Physiology (Phsl 202) - Elective
History of Physiology (Phsl 204)
Selected Topics in Permeability (Phsl 210) - Elective
Selected Topics in Heart and Circulation (Phsl 211)
Selected Topics in Respiration (Phsl 212)
Selected Topics in Neurophysiology (Phsl 216) - Elective
Topics in Microcirculation and Lymphatics (Phsl 219) - Elective
Methods of Analysis (Phsl 220) - Elective
Methods in Physiology (Phsl 227) - Elective
Transport Process in Biology (Phsl 230-231)
Respiration, Acid Base Chemical and Electrolyte Metabolism (Phsl 234)
Bioenergetics of Cardiac Contraction (Phsl 235)
Renal Hemodynamics (Phsl 236)
Biophysical Aspects of Nerve Function (Phsl 237)
Neural and Humoral Control of Circulation (Phsl 238)
Literature Seminar (Phsl 8-201) - Elective
Research in Physiology (Phsl 8-203) - Elective
Selected Topics in Alimentary Physiology (Phsl 8-213) - Elective

Dental:

Human Physiology (Phsl 2)
Human Physiology (Phsl 101)

Others:

Human Physiology (Phsl 2)
Human Physiology (Phsl 51)
Principles of Physiology (Phsl 52-53)
Principles of Physiology (Phsl 55-56)
Human Physiology (Phsl 70)
Readings in Physiology (91H)
Problems in Physiology (92H)
Physics for Biologists (Phsl 110-111)

Graduate Courses:

Human Physiology (Phsl 106-107)
Physics for Biologists (Phsl 110-111)
Hemodynamic Measurements (Phsl 112)
Problems in Physiology (Phsl 113)
Literature Seminar (Phsl 201)
Readings in Physiology (Phsl 202)
Research in Physiology (Phsl 203)
History of Physiology (Phsl 204)
Selected Topics in Permeability (Phsl 210)
Selected Topics in Heart and Circulation (Phsl 211)

Department of Physiology - Continued

Graduate Courses Continued:

Selected Topics in Respiration (Phsl 212)
Selected Topics in Neurophysiology (Phsl 216)
Topics in Microcirculation and Lymphatics (Phsl 219)
Methods of Analysis (Phsl 220)
Methods in Physiology (Phsl 227)
Transport Process in Biology (Phsl 230-231)
Respiration, Acid Base Chemical and Electrolyte Metabolism (Phsl 234)
Bioenergetics of Cardiac Contraction (Phsl 235)
Renal Hemodynamics (Phsl 236)
Biophysical Aspects of Nerve Function (Phsl 237)
Neural and Humoral Control of Circulation (Phsl 238)

Department of Anesthesiology: Every physician should be prepared to resuscitate his patients in respiratory or circulatory distress, as well as initiate therapy of comatose or respiratory crippled patients. The best method of learning these arts is to be responsible for anesthetic management of surgical patients. Furthermore, over half the graduates of this school enter a surgically oriented practice, either as general practitioners or specialists, and they will usually be responsible for directing nurse anesthetists. They, as well as those who refer patients for surgery, should understand fundamental principles of anesthetic care, drugs, and complications.

Undergraduate Courses:

Medical:

General Anesthesia
Regional Anesthesia
Pre & Postanesthetic Evaluation
Seminar
Research (5-169) - Elective
Externship in Clinical Practice of Anesthesiology (5-181) - Elective
Externship in Anesthesiology & Respiratory Problems (prereq. 5-181 & 5-182) - Elective

Graduate Courses:

General Anesthesia
Regional Anesthesia
Pre & Postanesthetic Evaluation
Seminar
Research

Department of Laboratory Medicine: The courses, although primarily required to direct the students' attention to accessory diagnostic procedures, aims also to complement the course in medicine and serve as an introduction to clinical medicine. The student is required to consider the patterns of disease and to recognize those aberrations of disease which may be detected by means of laboratory procedures. The courses consist of lectures, small group sessions, TV demonstrations, and laboratory instruction. The small group meetings provide for personal contact discussion, demonstrations, and active participation. The laboratory work includes the simpler but important laboratory tests, performed by the student during his clinical clerkship, which are part of the skills of the physician.

Undergraduate Courses:

Medical:

Immunology Seminar (193)
Basic Electronics of Laboratory Instruments (100)
Human Biochemical Genetics (162)
Human Biochemical Genetics Laboratory (163)
Hematology (165, 166)
Seminar: Hematology (167)
Human Genetic Traits Including Blood Groups (172)
Analytical Techniques in Laboratory Medicine (173, 174)
Interpretation of Laboratory Data (175, 176)
Principles in Electron Microscopy (146)
Electron Microscopy Techniques (147)
Ultrastructural Changes in Pathology (148)
Introduction to Clinical Chemistry (150)
Human Cytogenetics (160)
Human Cytogenetics Laboratory (161)
Laboratory and Clinical Hematology (LMed 5-181) - Elective
Medical Genetics (LMed 5-182) - Elective
Clinical and Laboratory Immunology (LMed 5-183) - Elective
Immunohematology in Blood Banking (LMed 5-184) - Elective
Laboratory Problems in Blood Coagulation (LMed 5-185) - Elective
Clinical Pathology Externship - HCGH (LMed 5-186) - Elective
Clinical Pathology Externship - Mt. Sinai (LMed 5-187) - Elective
Clinical Pathology Externship - Methodist Hospital (LMed 5-188) - Elective
Clinical Blood Bank Immunology (LMed 5-189) - Elective
General Clinical Microbiology (LMed 5-191) - Elective
Antibiotic Teaching Unit (LMed 5-192) - Elective
Research Seminar (190)
Departmental Seminar (191)

Department of Laboratory Medicine - continued

Undergraduate Courses:

Medical:

Computer Application in Laboratory Medicine (LMed 5-190) - Elective
Clinical Pathology Externship at Hibbing General Hospital (LMed 5-193) - Elective
Hematology - blood and blood forming organs(Lecture series)(LMed 5-765) - Elective
Hematology - b lood and bone marrow diagnosis (Lecture series,pre req.) (LMed 5-766) - Elective

Others:

Orientation in Medical Technology (10)
Case Presentations (30-31-32)
Clinical Chemistry (70)
Electrocardiography & Basal Metabolism Testing (73)
Clinical Hematology (75)
Clinical Microbiology (80A)
Special Clinical Microbiology (80B)
Clinical Immunology (83)
Histologic Techniques (85)
Advanced Clinical Practice (93)
Honors Course in Advanced Clinical Practice (93H)
Basic Electronics of Laboratory Instruments (100)
Introduction to Clinical Chemistry (62)
Introduction to Urinalysis (63)
Clinical Hematology: Methodology (65)
Introduction to Clinical Immunohematology (66)
Diagnostic Microbiology (68)
Clinical Chemistry (72)
Applied Clinical Chemistry (82)
Applied Clinical Hematology and Immunohematology (86)
Applied Diagnostic Microbiology (88)
Special Laboratory Methods (90)
Honors Program in Laboratory Methods (92H)
Advanced Clinical Laboratory Techniques (110,11)
Seminar: Medical Technology (120)
Elements of Administration in Medical Technology (130, 31)
Basic Electronics of Laboratory Instruments (100)
Principles in Electron Microscopy (146)
Electron Microscopic Techniques (147)
Ultrastructural Changes in Pathology (148)
Introduction to Clinical Chemistry (150)
Human Cytogenetics (160)
Human Cytogenetics Laboratory (161)
Human Biochemical Genetics (162)
Human Biochemical Genetics Laboratory (163)
Hematology (165, 166)

Department of Laboratory Medicine - continued

Others: continued

Seminar: Hematology
Human Genetic Traits Including Blood Groups (172)
Analytical Techniques in Laboratory Medicine (173, 174)
Interpretation of Laboratory Data (175, 176)
Research Seminar (190)
Departmental Seminar (191)
Immunology Seminar (193)

Graduate:

Educational Administration in Medical Technology (140, 141)
Development of Medical Technology (145)
Selected Topics in Bacteriology (150)
Selected Topics in Chemistry (151)
Selected Topics in Hematology (152)
Analytical Techniques in Laboratory Medicine (173-174)
Interpretation of Laboratory Data
Clinical Chemistry Seminar (185-186-187)

Department of Medicine: The Department of Medicine has two goals in teaching. The first is to instruct the student in certain general skills such as history taking and physical examination which are necessary in the care of patients. Working in small groups with a tutor, the student integrates the information obtained from the patient including his assesment of the social background and emotional reaction to illness with the laboratory and x-ray data in an attempt to design a plan of therapy.

The second goal is to acquaint the student with the body of knowledge represented by the subspecialties of medicine including dermatology. This is accomplished by study of patients with disease, supplemented by reading and lectures.

Undergraduate Courses:

Medical:

Physical Diagnosis (101 w,s)
Introduction to Internal Medicine (104)
Clerkship in Internal Medicine (112)
Externship (180)
Research in Medicine (181)
Special Clinical Problems (184)

Department of Medicine - continued

Medical - continued

Medical Oncology Externship in Medicine at University Hospital (Med 5-5010 Elective

Medical Externship at Veterans Administration Hospital (Med 5-502) - Elective
Medical Externship at St. Paul Ramsey (Med 5-503) - Elective
Medical Externship at Northwestern (Med 5-504) - Elective
Medical Externship at Mt. Sinai (Med. 5-505) - Elective
Research in Gastroenterology at University Hospital (Med. 5-511) - Elective
Research Topics in Hematology at University Hospital (Med.5-512) - Elective
Problems in Clinical Medicine at University Hospital (Med.5-521) - Elective
Gastroenterology at University Hospital (Med. 5-522) - Elective
Metabolism and Clinical Pharmacology at University Hospital (Med. 5-524) - Elective
Immunology, Allergy, and Infectious Disease at University Hospital (Med. 5-524) - Elective
Cardiovascular Disease at University Hospital (Med.5-525) - Elective
Electrocardiography at University Hospital (Med.5-526) - Elective
Renal at University Hospital (Med.5-527) - Elective
Clinical Hematology at University Hospital (Med.5-528) - Elective
Clinical Hematology (Abbreviated) at University Hospital (Med.5-529) - Elective
Seminar in Oncology at University Hospital (Med. 5-530) - Elective
Trends, Methodology, and Techniques in the Delivery of Medical Service at St. Paul Ramsey Hospital (Med 5-541) - Elective
Hematology at St. Paul Ramsey Hospital (Med. 5-542) - Elective
Cardiology at St. Paul Ramsey Hospital (Med. 5-543) - Elective
Pulmonary Disease at St. Paul Ramsey Hospital (Med.5-544) - Elective
Cardiology (EKG) at Veterans Administration Hospital (Med.5-551) - Elective
Clinical Hematology at Veterans Administration Hospital (Med. 5-552) - Elective
Pulmonary Disease at Veterans Administration Hospital (Med.5-553) - Elective
Fluid, Electrolyte and Acid-Base Metabolism at Veterans Administration Hospital (Med. 5-554) - Elective
Electrocardiography - Veterans Administration Hospital (Med. 5-555) - Elective
Cardiology Service at Hennepin County General Hospital (Med.5-561) - Elective
Renology Service at Hennepin County General Hospital (Med.5-562) - Elective
Pulmonary Disease at Hennepin County General Hospital (Med. 5-563) - Elective
Medical Emergency Room at St. Paul Ramsey Hospital (Med. 5-571) - Elective
Ambulatory Medicine at St. Paul Ramsey Hospital (Med. 5-572) - Elective
Medical Out-Patient Clinics at Hennepin County General Hospital (Med.5-573) Elective

Graduate:

Clinical Medicine (201)
Diseases of the Cardiovascular Apparatus (202)
Research in Medicine (203)
Diseases of the Chest (205)
Clinical Conference (206)
Clinical Pathological Conference (207)

Department of Medicine - continued

Graduate:

Clinical Radiological Conference (208)
Seminar: Infectious Disease (210)
Electrocardiographic Conference (211)
Pigment Metabolism (212)
Psychosomatic Medicine (213)
Seminar: Cardiovascular (214)

Department of Obstetrics and Gynecology: Provides course material for medical students and graduate students in the clinical fields of obstetrics and gynecology.

Undergraduate Courses:

Medical:

Obstetrics Lectures (120)
Introduction to Obstetrics and Gynecology (124 w)
Clinical Clerkship in Obstetrics and Gynecology (135)
Externship in Obstetrics (184)
Externship in Obstetrics (Obst. 5-500) - Elective
Externship in Gynecology (Obst. 5-505) - Elective
Externship in Obstetrics & Gynecology (Obst. 5-510) - Elective
Obstetrics and Gynecology Externship in Clinical Practice (Obst. 5-515) Elective
Problems in Obstetrics and Gynecology (Obst. 5-520) - Elective
Psychiatric Aspects of Obstetrics & Gynecoloy (Obst. 5-540) - Elective
Research in Reproduction (Obst. 5-560) - Elective

Graduate:

Problems in Obstetrics and Gynecology (190)
Advanced Obstetrics & Gynecology, Part I (201,202,203,204)
Advanced Obstetrics & Gynecology, Part II (205,206,207,208)
Advanced Obstetrics & Gynecology, Part III (209,210,211,212)
Staff Conference Seminar (213,214,215)
Research (216,217,218,219)
Clinical Obstetrics & Gynecology (221,222,223,224)

Department of Ophthalmology: It is the general objective of the Department of Ophthalmology to provide the medical student with sufficient knowledge of the function, measurement of function and disease of the visual system, particularly as they relate to systemic diseases. It will provide those medical students with particular interest in the field of Ophthalmology, the opportunity to express it either at the clinical level or in the research laboratory. It will adequately train at the graduate level, physicians for the private practice of Ophthalmology. It will provide certain selected interested indivisuals additonal training so that

they may have the necessary background for academic ophthalmology. It will develop a basic research program in the field of Opthalmology which will embrace the major basic sciences as they are applied to the study of ocular tissues. It will develop a clinical research program which may or may not tie in with the basic research being done in the laboratory but by so doing to acquaint the graduate student regardless of his ultimate goals with the requirements of doing and evaluating good research. It will develop within the framework of the department a service program which will devote itself to certain of the special areas of service which are either best handled in a large center because of the necessary equipment and expertise for which the center can serve as consultant to the individuals in the private practice of Opthalmology. It will provide the mechanisms for continuing education of both the generalist of family practitioner and the specialist in the field of Opthalmology.

Undergraduate Courses:

Medical:

Opthalmology (100)
Externship in Opthalmology (180)-Elective
Opthalmology Research Problems (190)-Elective

Graduate Courses:

Clinical Opthalmology (200)
Practical Ocular Surgery (201)
Ocular Pathology Conference (202)
Basic and Applied Opthalmology (203)
Seminar: Ophthalmology (204)
Neuro-ophthalmology (205)
Refraction (206)
Ocular Muscles (207)
Didactic Ocular Surgery (208)
Pathology of the Eye (209)
Radiology of the Eye, Orbit, and Head (210)
External Diseases (211)

Department of Ophthalmology - continued

Graduate Courses continued:

Medical Ophthalmology (212)
Physiologic Optics (213)
Opthalmology Laboratory (214)
Research in Opthalmology (215)
Pathology Seminar (216)

Department of Otolaryngology: The medical student first becomes acquainted with otolaryngology through a series of didactic lectures which emphasize broad aspects of the field and discussions of basic principles when applicable. This provides the necessary first step in familiarization with the content of the specialty. The essence of teaching in the Department of Otolaryngology consists of active student participation in the clinical examination of patients with otolaryngological disorders. This is supplemented by discussions and seminars with the faculty. During this time the student develops skills in the examination (especially indirect laryngoscopy) and interpretation of findings. Students are also encouraged to spend additional elective time in clinical, surgical, and research services in the department.

Undergraduate Courses:

Medical:

Otolaryngology (101)
Otolaryngology Externship (191) - Elective
Research in Otolaryngology (Otol 5-194) - Elective

Graduate Courses:

Fundamentals of Sound
Anatomy & Physiology of Speech & Hearing Mechanism
Hearing Disorders
Audiometry I
Communication Problems of the Hearing Impaired
Audiometry II
Hearing Science
Industrial Audiology & Occupational Hearing Loss
Auditory Training
Lip Reading & Lip Reading Methods
Clinical Methods & Practice in Audiology
Research
Diagnosis of Disorders in the Auditory System

Department of Otolaryngology - continued

Graduate Courses:

Selection & Use of Hearing Aids
Pediatric Audiology
Seminar: Hearing
Seminar: Current Issues in Audiology
Advanced Clinical Methods & Practice in Audiology

Department of Pediatrics: The field of pediatrics is concerned with the basic aspects of human developmental biology during prenatal and postnatal life extending through the entire period of growth and development to maturity. Students obtain experience by participating in the patient-care programs for children in the outpatient and inpatient services of the University Hospitals and in affiliated community hospitals. Working experience in all aspects of diseases as they occur in children is provided. Students have the opportunity to observe and participate in diagnostic and care programs concerned with the premature and the newborn, growth and developmental processes, endocrinology, allergy, cardiology, psychiatry, communicable diseases, and in problems of a nutritional or metabolic nature. There is considerable emphasis on preventive as well as therapeutic medicine. The program provides a broad spectrum of experience concerning all of the medical, psychologic, and social problems that may affect children.

To help the student reinforce fundamental concepts, the program maintains strong emphasis on the application of basic knowledge in the prevention, diagnosis, and management of diseases in infants and children. Opportunities for a special interest in selected areas of pediatrics are provided to interested students.

Undergraduate Courses:

Medical:
Clinical Lectures in Pediatrics (Ped 120)
Clinical Clerkship in Pediatrics (Ped 135)

Department of Pediatrics - Continued

Undergraduate Courses:

Medical:

Clinical Pharmacology (Peds5-542)-Elective
Nephrology at the University Hospital(Peds5-543)-Elective
Immunology at the University Hospitals (182M)-Elective
Pediatric Pulmonary Disease(Peds5-544)-Elective
Infectious Disease at University Hospitals(Peds1820)-Elective
Pediatric Neurology at the Mayo Clinic(Peds.5-541)-Elective
Child Psychiatry at the Mayo Clinic(Peds.5-545)-Elective
Research at Community University Health Care Center(Peds5-571)-Elective
Research in Pediatrics(Peds 183)-Elective
The Prenatal Interview as a Predictor of Health Risk areas for the child (Peds5-572)-Elective
Research in Immunocytology(Peds5-573)-Elective
Inpatient Externship at Hennepin County General Hospital(Peds501)-Elective
Inpatient and Outpatient Externship at Children's Hospital(Peds502)-Elective
Inpatient Externship at St. Paul Ramsey (503)-Elective
Outpatient Externship at University Hospital(511)-Elective
Outpatient Externship at Hennepin County General Hospital(512)-Elective
Clinical Experience at Community-University Health Care Center(513)-Elective
Community Pediatrics at Pilot City Health Center(514)-Elective
Outpatient Health Care at St. Paul Ramsey Hospital(515)-Elective
Clinical Pediatrics at the Mayo Clinic(516)-Elective
Neo-Infant Program(531)-Elective
Clinical Immunology at University Hospital(532)-Elective
Pediatrics Cardiology at the Mayo Clinic(533)-Elective
Pediatrics Cardiology at the University Hospital(534)-Elective
Infectious Disease(535)-Elective
Pediatric Hematology-Oncology at University Hospital(536)-Elective
Pediatric Encodrinology and Metabolism at University Hospital(537)-Elective
Endocrinology and Metabolism(538)-Elective
Introduction to Neonatology(539)-Elective
Pediatric Neurology at University Hospital(540)-Elective

Graduate:

Pediatric Seminar
Pediatric Clinic
Pediatric Residency
Pediatric Special Interest
Pediatric Research

Department of Physical Medicine and Rehabilitation: The comprehensive medical management of patients with chronic disease and disability requires that the physician be skilled in leading the multidisciplinary approach of the health sciences. The Department of Physical Medicine and Rehabilitation utilizes the

the rehabilitation center to provide within a single area of University Hospitals the setting in which the multidisciplinary approach can be taught. By example, precept, and tutorial methods the concept of comprehensive care of the patient as the minimal program for adequate patient care is taught. Methods of coordination, communication, leadership, and administration are taught upon a foundation of patient management and the practice of physical medicine. By active involvement the student may become prepared for similar activities in his own professional practice. The rehabilitation process takes place in a setting of research into new techniques and programs for the better management of patients and for the better education of members of the health professions.

Undergraduate:

Medical:

Physical Medicine and Rehabilitation (122)
Externship in Physical Medicine and Rehabilitation (181)
Seminar: Rehabilitation Literature (191)
Adult Rehabilitation Medicine (PMed.5-410)-Elective
Pediatric Rehabilitation Medicine (PMed.5-411)-Elective
Arthritis Rehabilitation(PMed.5-412)-Elective
Amputation Rehabilitation (PMed.5-413)-Elective
Physical Medicine and Rehabilitation for the Family Physician (PMed.5-414)-Elective
Psychological Aspects of Chronic Disease (PMed.5-415)-Elective
Histopathology, Electordiagnosis, and Kinesiology (PMed.5-420)-Elective
Research in Physical Medicine and Rehabilitation (PMed.5-430)-Elective

Other:

Theory of Therapeutic Exercise (PMed.80A)
Theory of Therapeutic Exercise (PMed.80B)
Technique of Therapeutic Exercise (PMed.81A)
Technique of Therapeutic Exercise (PMed.81B)
Functional Neuroanatomy & Neurophysiology(PMed.82)
Theory, Technique of Muscle Function (PMed.83A)
Theory, and Technique of Muscle Function, Tests, and Measurements (PMed.83B)
Rehabilitation Procedures (PMed.85)
Rehabilitation Procedures(PMed.84)
Evaluation Procedures (PMed.86)
Orientation to Clinical Education(PMed.87)
Clinical Education (PMed.88)
Clinical Education (PMed.89)
Administration (PMed.90)

Department of Physical Medicine and Rehabilitation - continued

Others:

Administration and Supervision (PMed.93)
Clinical Training in Occupational Therapy (PMed.94,95,96)
Introduction to Scientific Research (PMed.97)
Problems: Physical Therapy (PMed.98)
Patient Assessment (PMed.101)
Physical Therapy Clinic (PMed. 103)
Clinical Medicine in Rehabilitation (PMed.161)
Problems in Physical Therapy (PMed.180)
Introduction to Scientific Literature & Research in Physical Therapy (PMed.197)
Research Problems in Physical Therapy (PMed. 198)
Introduction to Occupational Therapy (PMed.1)
Orientation to Physical Therapy and Rehabilitation(PMed.2A)
Orientation to Physical Therapy and Rehabilitation(PMed.2B)
Orientation to Occupational Therapy (PMed. 3)
Orientation to Occupational Therapy (PMed. 4)
Therapeutic Recreation (PMed.5)
Medical Terminology (PMed.54)
Work Evaluation and Community Resources (PMed.55)
History & Philosophy of Rehabilitation Medicine (PMed.57)
Bandaging, Aseptic, Isolation Techniques (PMed.58)
Theory, Technique of Thermo-, Hydro-, Phototherapy (PMed. 60A)
Theory, Technique of Electrotherapy (PMed.60B)
Theory of Physical Medicine, Rehabilitation Applied to Medical Sciences (PMed.61,6
Senior Clinic (PMed.64)
Introduction to Scientific Literature (PMed.66)
Methods of Scientific Research (PMed.67)
Applied Anatomy (PMed.68)
Theory and Techniques of Massage (PMed.70)
Theory: Human Development (PMed.71)
Theory: General Medical and Surgical Conditions (PMed.72)
Theory: Psychosocial dysfunction (PMed.73)
Therapeutic activities (PMed.74)
Therapeutic activities (PMed.75)
Techniques of Occupational Therapy (PMed. 76)
Theory: Physical Dysfunction (PMed.77)
Group Process Seminar (PMed.78)
Peripheral Vascular Disease Clinic (PMed.204)
Electronics in Physical Medicine and Rehabilitation (PMed.211)

Graduate Courses:

Physiatry Service (PMed.200)
Readings in Physical Medicine and Rehabilitation (PMed.205)
Conference on Physical Medicine and Rehabilitation (PMed.206)
Research in Physical Medicine (PMed.211)
Electrodiagnosis and Electromyography (PMed.212)
Seminar: Physical Medicine and Rehabilitation (PMed.220)

Department of Neurosurgery: Provides instruction in the discipline of neurosurgery to medicaland graduate students.

Undergraduate Courses:

Medical:

Clinical Lectures in Neurosurgery (127)
Externship at University Hospital (NSur. 5-500)-Elective
Externship at Veterans Administration Hospital (NSur. 5-510)-Elective
Externship at Hennepin County General Hospital (NSur. 5-511)-Elective
Neurosurgery Investigation (NSur. 5-520)-Elective

Graduate Courses:

Neurosurgery Diagnosis
Neurosurgery Service
Operative Neurosurgery
Neurosurgery Research
Neurosurgery Conference

Department of Orthopedic Surgery: Provides the medica student with the ability to properly examine a patient from an orthopedic standpoint and to provide him with basic information on those problems which he would be called upon to manage in a variety of situations. Provides graduate instruction in the specialty of orthopedic surgery.

Medical:

Principles of Diagnosis, Treatment, Prognosis of Fractures, Dislocations (122)
Clinical Lectures in Orthopedic Surgery (140)
Externship in Orthopedic Surgery and Fractures (185)
Research Problems (186)
Externship in Orthopedic Surgery (OrSu. 5-185)- Elective
Externship in Orthopedic Surgery (OrSu. 5-187)-Elective
Externship in Orthopedic Surgery (OrSu. 5-188)-Elective
Externship in Orthopedic Surgery (OrSu. 5-189)-Elective
Research Problems in Orthopedic Surgery (OrSu. 5-186)-Elective

Graduate Courses:

Orthopedic Conference
Fractures
Orthopedic Diagnosis
Pediatric
Orthopedic Problems and Management
Orthopedic Pathology
Orthopedic Operative Surgery
Orthopedic Anatomy
Orthopedic Research

Department of Psychiatry: Provides instruction in principle of psychiatry regardless of specialty the student subsequently enters. Instruction in the specialty of psychiatry is provided for graduate students. This department includes clinical psychology.

Undergraduate Courses:

Medical:

Clinical Clerkship in Psychiatry and Neurology (103)
Basic Behavioral Science (120s)
Behavior Pathology and Psychiatric Methods (121s)
Clinical Lectures in Psychiatry (122f)
Psychological Problems in Medical Practice (PtrA 5-520)-Elective
Externship in Adult Psychiatry at Hennepin County General Hospital (PtrA5-500) Elective
Externship in Adult Psychiatry at St. Paul Ramsey (PtrA5-501)-Elective
Externship in Adult Psychiatry at Veterans Administration Hospital (PtrA 5-502)-Elective
Externship in Adult Psychiatry at Fairview and St. Mary's (PtrA 5-503)-Elective
Clinical Problems in Psychiatry (PtrA 5-510)-Elective

Others:

Descriptive Psychiatry

Graduate Courses:

Problems in Psychiatry (193)
Child Psychiatry (192)
Readings: Psychiatry
Descriptive Psychopathology
History of Psychiatry
Special Research Topics
Psychometric Clerkship
Internship, Clinical Psychologists
Advanced Seminar
Professional Methods in Clinical Psychology
Clinical Inpatient Psychiatry

Department of Neurology: Provides a series of instructional settings designed to teach basic aspects of clinical neurology, electromyography, EEG, neurophysiology, neurochemistry or serve combinations of these to medical students. Specialty training in neurology for graduate students is conducted.

Department of Neurology - continued

Undergraduate Courses:

Medical:

Clinical Neurology (101)
Clinical Clerkship in Psychiatry and Neurology (103)
Externship in Clinical Practice-University Hospital (Neur.5-510)-Elective
Problems in Basic and Clinical Neurology (182)
Externship in Clinical Practice-St. Paul Ramsey Hospital (Neur.5-511)-Elective
Externship in Clinical Practice in Hennepin County General Hospital (Neur. 5-512)-Elective
Externship in Clinical Practice-Veterans Administration Hospital(Neur. 5-513)-Elective
Selected Problems in Neurology (Neur.5-120)-Elective
Nurochemistry-University Hospital (Neur.5-540)-Elective
Neurochemistry-Pediatrics Neurology-University Hospital (Neur.5-541)-Elective
Clinical Electroencephalography-University Hospital-(Neur.5-544)-Elective
Electromyography-University Hospital (Neur.5-545)-Elective
Neuropathology (Neur.5-550)-Elective
Clinical Neurophysiology-St. Paul Ramsey Hospital-(Neur.5-555)-Elective
Genetics-Veterans Administration Hospital (Neur.5-560)-Elective

Others:

Descriptive Neurology (171B)

Graduate Courses:

Problems in Neuropathology (143)
Clinical Neurology (208)
Research in Neurology (209)
Advanced Neuropathology (210)
Survey of Neuropathology (212)
Neuropharmacology (213)
Child Neurology (214)
Neurological Complications of Internal Disease (215)
Clinical Neurochemistry (216)
Electronics of Neurological Instrumentation (219)
Advanced Clinical Neurology (220)
Neurochemistry (221)
Seizure Mechanisms (222)
Infectious Disease of the Nervous System (224)
Neuro-ophthalmology (225)
Neurological-Neurosurgical Conference (226)
Neurological Development (227)
Research in Neuropathology (228)
Behavior Assessment of the Neurology Patient (229)
Electroenephalography (230)
Applied EEG and Myography (231)

Department of Neurology - continued

Graduate Courses:

Applied Neuroroentgenology (232)
Applied Neuropathology (233)
Neuromuscular Diseases (236)
Neurological Clinical Pathological Conference (238)
Neuroanatomy (239)
Neuropathology Conference (240)
Neuroadiology (241)
Neurological Speech Disorders (247)
Applied Neurophysiology (248)
Survey of Neurology for Psychiatry Residents (249)
Clinical Correlative Neuroanatomy (245)
Neurogenetics (246)

Department of Radiology: Provides instruction in the disciplines of diagnostic radiology, radiation therapy, and nuclear medicine. Training of x-ray technologists is the responsibility of this department.

Undergraduate Courses:

Medical:

Problems in Diagnostic Radiology (184)
Roentgen Technique (186)
Externship in Radiology (Rad.5-500)-Elective
Externship in Radiology (Rad.5-501)-Elective
Externship in Radiation Therapy (Rad.5-505)-Elective
Externship in Diagnostic Radiology at University Hospital (Rad.5-510)-Elective
Externship in Diagnostic Radiology at Hennepin County General Hospital-(Rad.5-511)-Elective
Externship in Diagnostic Radiology at Veterans Hospital (Rad.5-512)-Elective
Problems in Radiation Biology and Radioactive Isotope Methods (Rad.5-530) Elective

Other:

Technique I
Technique I Lab
Technique II
Technique II Lab
Anatomy
Nursing Lab
Nursing Lecture
Physics
Math of Exposure
Equipment and Physics

Department of Radiology - continued

Graduate Courses:

Fundamentals of Radiation Physiology, Nuclear Medicine
Radiation Biophysics
Problems, Radiology Biology
Tumor Clinic Conference
Research: Radiology Therapy, Nuclear Medicine, Radiobiology
Dosimetry of Internal, External Radiation Emitte
Seminar: Radiology, Biophic
Radiation Therapy Seminar
Pediatric Rounds
Grand Rounds
NUCLEAR MEDICINE
Biophysics(170,171,172)
Radiation Physics(f,w,s)
Nuclear Medicine (104 f,w,s)
Radiation Dosimetry (211 f,w,s,su)
Isotope Scan (f,w,s)

Department of Surgery: The courses for medical students are designed to provide the student with a basic knowledge of the pathophysiology of disease and to encourage application of basic science knowledge to clinical surgical diseases in both general surgery and the surgical subspecialties. The students are given an exposure to basic pathophysiology and a study of the etiology, pathogenesis, and diagnosis of various surgical disease entities and how they relate to clinical surgery. In the clinical year, the student is given an opportunity to apply physiological knowledge to surgical diseases through direct patient contact during the surgical clerkship at the University Hospitals and at affiliated hospitals. In addition to the inpatient surgical clerkship, small group seminar sessions with individual members of the full-time staff are offered each afternoon to provide close contact between the students and staff to review basic surgical problems. Particular emphasis is placed upon the acquisition of basic diagnostic skills and upon development of a sound physiological knowledge of surgical diseases. In addition, the student receives instruction in operating room asepsis and pre- and postoperative care of surgical patients.

Department of Surgery - continued

Elective courses are offered in general surgery and all the surgical subspecialties, primarily to increase the scope of clinical exposure and give the student an opportunity to participate in the fundamentals of surgical research.

Undergraduate Courses:

Medical:

Principles of Surgery (121s)
Clinical Lectures in General Surgery (129)
Clinical Clerkship (135)
Cardiovascular Surgery (181)
Problems in Clinical Investigation and/or Problems in Experimental Surgery (182)
Externship in Surgery at University-Transplantation and General Surgery (Surg. 5-500) - Elective
Externship in Surgery at University-Cardiovascular and Thoracic Problems (Surg. 5-501) - Elective
Externship in Surgery at University (Surg. 5-502) - Elective
Externship in Surgery at University - Pediatrics Surgery - (Surg. 5-503) - Elective
Externship in Surgery at University - General Surgical Problems including some Thoracic and Cardiovascular Cases (Surg.5-504)-Elective
Externship in Surgery at Veterans Administration Hospital (Surg.5-510)-Elective
Externship in Surgery at St. Paul Ramsey Hospital (Surg. 5-511) - Elective
Externship in Surgery at Hennepin County General Hospital (Surg. 5-512)-Elective
Externship in Surgery at Mt. Sinai Hospital(Surg.5-513)-Elective
Experimental Surgery (Surg.5-520)-Elective

Graduate Courses:

Outpatient Clinic in Surgery
Proctoscopy and Signoidoscopy
Tumor Clinic
Surgical Diagnosis
Surgical Problems and Management
Operative Surgery
Surgical Ward Conference
Surgical-Roentgenological Conference
Surgical Research
Surgical Seminar
Surgery-Medical Pathological Conference
Peripheral Vascular Surgery
Surgery-Physiology Conference
Biomedical-Engineering Seminar
Transplant Seminar

Department of Urology: Provides a setting for instruction in the field of urological surgery for medical students and graduates.

Undergraduate Courses:

Medical:

Urology Lecture (173)
Externship in Urology (Urol. 5-180) - Elective

Graduate Courses:

Urological Surgery
Cystoscopy and Urology Diagnosis
Urological Conference
Research in Urology
Urological Seminar
Urology-Radiology Conference
Urology-Pathological Conference

Department of Public Health:

Undergraduate Courses:

Medical:

Medical Statistics I (Pub.H. 90)
Elements of Preventive Medicine and Public Health (Pub.H. 100)

GRADUATE PROGRAM

Graduate students, including those in Basic Science programs and all Clinical Residents (fellows) are enrolled in the Graduate School of the University and attend courses which lead to the M.S. or Ph.D. degree. The following table lists the number of graduate students or fellows enrolled in the particular Basic Science discipline or clinical specialty for the years 1965 - 1968. Granted degrees are also listed.

Department	Fellows Enrolled				Degrees Granted					
				Fall Quarter	1965-66		1966-67		1967-68	
	1965-66	1966-67	1967-68	1968	MS	Ph.D.	MS	Ph.D.	MS	Ph.D.
BASIC SCIENCES										
Anatomy	41	45	44	42	3	2	1	8	-	3
Biochemistry	82	95	109	90	-	1	-	-	1	-
Microbiology	57	55	60	52	8	6	5	6	3	5
Pathology	33	30	20	23	-	-	-	1	-	-
Pharmacology	29	37	29	31	-	5	-	8	-	8
Physiology	53	47	51	39	-	2	1	3	2	7
CLINICAL SCIENCES										
Anesthesiology	16	21	28	23	-	-	-	-	1	-
Dermatology	14	10	9	12	4	-	-	-	-	-
Laboratory Medicine	0	0	7	8	-	-	-	-	-	-
Medicine, Internal	131	107	115	124	-	1	-	2	3	1
Neurology	25	20	23	26	1	2	1	-	-	-
Neurosurgery	7	8	12	12	-	-	-	-	-	-
Obstetrics & Gynecology	15	12	16	14	-	-	-	-	-	-
Ophthalmology	15	17	18	19	-	-	-	-	-	-

Continued

Department	Fellows Enrolled				Degrees Granted					
	1965-66	1966-67	1967-68	Fall Quarter 1968	1965-66 MS	1965-66 Ph.D.	1966-67 MS	1966-67 Ph.D.	1967-68 MS	1967-68 Ph.D.
CLINICAL SCIENCES (Contd.)										
Orthopedic Surgery	22	23	28	14	-	-	-	-	-	-
Otolaryngology	11	13	13	15	-	-	-	-	-	-
Pediatrics	44	47	48	52	-	-	-	-	-	-
Physical Medicine & Rehabilation	5	9	10	10	-	-	1	-	1	-
Proctology	1	0	0	0	-	-	-	-	-	-
Psychiatry	28	21	24	26	-	1	-	-	1	-
Radiology	52	50	58	64	1	1	1	-	-	-
Surgery	134	120	120	100	-	5	-	11	2	5
Urology	14	20	20	11	1	1	-	-	-	-
TOTALS	829	807	862	807	18	27	10	39	14	29

It is planned that by completion of the proposed facilities, at least 120 graduate students, including clinical department residents, will be added to the various programs.

UNIVERSITY OF *Minnesota*

OFFICE OF POSTGRADUATE EDUCATIONAL ACTIVITIES
BOX 193 MAYO MEMORIAL BUILDING · MINNEAPOLIS, MINNESOTA 55455

June 23, 1969

TO: Dean Robert Mulhausen

FROM: Lee D. Stauffer

In response to your recent request, I am enclosing the attached information for your use. These sheets show the courses, hours of instruction, and enrollment for the past two academic years as well as the projection for the next academic year.

We are attempting to change the emphasis of the program at this time to insure the involvement of the practitioner in the planning of our educational offerings.

We hope, this next year, to begin the planning of a "cyclic curriculum" which would review systematically, information that we believe the practitioner should possess, in both the clinical and basic sciences. This would make it possible for a physician to schedule a systematic review of medical knowledge over a recurring 2, 3 or 4-year cycle. We anticipate that much of this information should and can be put into the form of programmed learning, or various other visual or audio media and distributed directly to physicians or made available through the hospitals. We plan to put great emphasis on the development of our relationships with the hospitals and practitioners this coming year.

The need for short courses will continue, however, and it may be that several cyclic curricula will emerge, one for family physicians, and others for each of several specialty groups.

We obviously will have increasing and expanding reliance upon the library, audio visual, the Department of Radio and Television, and other educational departments in the University.

LDS/rka
Enclosures
RKA

HEALTH SCIENCES CENTER
COLLEGE OF MEDICAL SCIENCES

MEDICAL EDUCATION COURSES

OFFICE OF POSTGRADUATE EDUCATIONAL ACTIVITIES

COLLEGE OF MEDICAL SCIENCES

1967 - 1968

NAME	DATES	A.A.G.P. HOURS	ENROLLMENT
Pediatrics	September 19-21, 1967	15	36
Dermatology	October 19-21, 1967	14	32
Radiology (Gastrointestinal)	October 30-November 3, 1967	35	465
Neurology	November 8-10, 1967	18½	27
Ophthalmology (Refraction)	November 15-17, 1967	13½	6
Orthopedic Surgery	November 30-Dec. 1-2, 1967	18	43
Otolaryngology	January 18-20, 1968	14½	39
Obstetrics	January 25-27, 1968	15	29
Psychiatry	February 8-10, 1968	13	26
Internal Medicine	February 19-21, 1968	23	81
Proctology	April 15-19, 1968	28	25
Trauma	April 20, 1968	7½	21
Ophthalmology	April 29-May 1, 1968	21	37
Surgery	May 23-25, 1968	25	142
Anesthesiology	May 23-25, 1968	16	26
	TOTAL	277	1035

MEDICAL EDUCATION COURSES

OFFICE OF POSTGRADUATE EDUCATIONAL ACTIVITIES

COLLEGE OF MEDICAL SCIENCES

1968 - 1969

NAME	DATES	A.A.G.P. HOURS	ENROLLMENT
Pediatrics	September 17-19, 1968	19	51
Dermatology	October 18-19, 1968	9	46
Radiology (Nuclear Medicine)	October 21-25, 1968	35	263
Ophthalmology (Refraction)	November 13-15, 1968	13½	6
Orthopedic Surgery (Scoliosis)	November 21-23, 1968	18	80
Otolaryngology	January 16-18, 1969	13½	18
Obstetrics	January 23-25, 1969	15	39
Pediatric Neurology	February 13-15, 1969	14	33
Internal Medicine	February 17-19, 1969	20½	94
Proctology	April 21-25, 1969	26	35
Ophthalmology	April 28-29, 1969	11	48
Anesthesiology	May 5-7, 1969	18	40
Rheumatic Disorders	May 9-10, 1969	11	29
Surgery	May 21-24, 1969	30½	169
	TOTAL	294	951

MEDICAL EDUCATION COURSES

OFFICE OF POSTGRADUATE EDUCATIONAL ACTIVITIES

COLLEGE OF MEDICAL SCIENCES

1969 - 1970

NAME	DATES	A.A.G.P. HOURS	ENROLLMENT
Dermal Pathology	August 18-22, 1969	30	
Fourth Annual Symposium on Kidney Disease	September 20, 1969	6	
Pediatrics	September 23-25, 1969	18	
Workshop on Hypnosis	September 25-27, 1969	18	
Otolaryngology	September 25-27, 1969	15	
Neurological Aspects of Internal Disease	October 2-4, 1969	15	
Medical Oncology Today	October 8-11, 1969	21	
Automotive Medicine	October 16-18, 1969	15	
Obstetrics	October 22-24, 1969	18	
Radiology	October 27-31, 1969	30	
Dermatology	November 6-8, 1969	15	
Diabetes	November 12-14, 1969	18	
Ophthalmology (Refraction)	November 12-14, 1969	18	
Scoliosis	November 17-19, 1969	15	
Psychotherapy in the Office	February 5-7, 1970	15	
Internal Medicine	February 16-17, 1970	12	

Continued --2

Clinical Management of Allergy	March 5-7, 1969	15
Trauma	April 17, 1970	7
Ophthalmology	May 4-5, 1970	12
Proctology	May 4-8, 1970	30
Surgery	May 20-23, 1970	21
Anesthesiology	May 21-23, 1970	15
Clinical Otology	June 18-20, 1970	15
	TOTAL	394

Part I G Program

RESEARCH ACTIVITIES

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UNIVERSITY OF MINNESOTA

Department of Anatomy

Programs of Study

The Anatomy Department offers programs leading to the Ph.D. degree. (Students occasionally are accepted for the M.S. degree if this limited training is consistent with their career goals but preference is given to Ph.D. candidates.) The Ph.D. programs are geared to prepare students for independent research and teaching. The department also accepts students in the combined M.D.-Ph.D. and D.D.S.-Ph.D. programs. Students interested in the combined programs should write directly to the respective medical or dental schools.

The program in anatomy is designed to fulfill the needs of the modern anatomist. Anatomy today is concerned with the study of structure at all levels, from the whole organism to molecular structure; it is concerned with the manner in which structure varies with time, physiological state and pathological alteration.

The initial year of the program is devoted to acquiring a broad fundamental knowledge of microscopic anatomy, embryology, neuroanatomy and gross anatomy. In the ensuing years the student concentrates on a program designed to suit his needs. The candidate works under the supervision of a faculty adviser.

Candidates may avail themselves of graduate courses given at the Colleges of Medical Sciences, Engineering, Biological Sciences, and many others, all of which are located on a common campus.

The broad research interests of the faculty are indicated by the information on the reverse side of this page.

Research Facilities

The Anatomy Department is fully equipped to handle research projects in the several areas mentioned above. Air-conditioned animal quarters housing many varieties are readily available. Equipment includes several electron microscopes, automatic radioactive counters, spectrophotometers, including an infrared spectrophotometer, electronic quantitators, ultracentrifuge, photographic equipment and many other pieces of equipment usually found in departments of biochemistry. Some of these pieces of equipment are linked to the computer facilities available both at the main University and at the Medical Center.

Financial Aid

USPHS traineeships or University Fellowships are normally offered to acceptable students. Stipends are in keeping with USPHS standards — $2400 for the first post-baccalaureate year, $2600 for the years between the first and terminal year, and $2800 for the terminal year. USPHS trainees receive tuition allowances and further allowances of $500 for a dependent spouse and $500 for each dependent child.

Cost of Study

Tuition and fees are included in the stipends offered to Ph.D. candidates with USPHS traineeships. University Fellowships are tax-free but do not include tuition allowances.

Cost of Living

Both private and University housing (fraternity and non-fraternity) are available. Limited campus housing for married students also is available ranging from $70 to $90 per month. Private housing rates vary widely depending upon accommodations.

Student Body

A total of approximately 30 graduate students are enrolled in the anatomy program. Total enrollment on the Twin Cities campuses approximates 36,000 students of whom over 7,000 are graduate students.

The Twin Cities Area

The population of the Twin Cities of Minneapolis and St. Paul numbers about one million persons. It is richly endowed with lakes and parks. Cultural activities include the Minnesota Orchestra housed on the University campus, and several permanent theaters including the nationally famous Tyrone Guthrie Theater. Sports-minded individuals may participate in swimming, fishing, hunting, skiing, etc., within short distances of the campus. Spectator sports include major college sports on campus and professional teams in football (Vikings), baseball (Twins), and hockey (North Stars).

The University

The University of Minnesota was founded in 1851. It is considered one of the leading educational institutions in the world and is particularly strong in its research activities. The Medical Center includes the Schools of Dentistry, Pharmacy, Nursing, and Public Health, as well as Medicine.

Applying

Prospective students are advised to write for applications in the winter prior to the fall quarter in which they wish to be admitted. A bachelor's degree is required which includes 9 credits of biology; a good background in chemistry, physics and mathematics is strongly recommended. Applicants are urged to take the Graduate Record Examination. The deadline for applications is early in February.

Correspondence and Information

Coordinator of Graduate Study
Department of Anatomy
University of Minnesota
Minneapolis, Minnesota 55455

RESEARCH PROGRAM DEPARTMENT OF ANATOMY UNIVERSITY OF MINNESOTA

Scope of Research

Modern research in Anatomy is concerned with the study of structure at all levels, extending from the whole organism to the arrangement of molecules in the subcellular organelles of the cell; it is also concerned with the manner in which structure varies with time, with physiological state and with pathological alteration. The research interests of the departmental faculty members are varied. Our department has a major research emphasis in the following areas: cytochemistry-cell biology, electron microscopy, quantitative histochemistry, experimental teratology and tissue organ culture. A number of studies related to experimental diabetes, hematology and liver disease are in progress. A departmental USPHS program-project grant supports a multidiscipline study in experimental diabetes with major emphasis on the pancreatic islet tissue, the factors which influence the development and progression of diabetes in experimental animals and changes in the capillary basement membrane as it relates to the development of the complications of diabetes. Studies in information retrieval, with particular emphasis on the diabetes literature, relate to more effective methods of document handling in micro-image format and the machine retrieval of full-text using a computer base system. A more comprehensive picture of the departmental research interests is contained in the attached description of the departmental faculty published in the 1969 Peterson's Guide to Graduate Study.

The breakdown of the departmental staff by academic rank and source of funding is shown in the following table.

DEPARTMENT OF ANATOMY STAFF

Rank	No.	Total Salary	State Funds	Other Funds
Professors	3	73,500	60,900	12,600
Associate Professors	4	78,300	53,900	24,400
Assistant Professors	6	78,200	62,500	15,700
Instructors	3	28,250	19,230	9,020
Research Associates	4	38,816		38,816
Research Fellows	4	32,948	300	32,648
Technicians	31	186,055	47,334	138,721
TOTALS		516,069	244,164	271,905

DEPARTMENT OF ANATOMY RESEARCH AND TRAINING GRANTS

Principle Investigator	Title	Amount	Source of Funds
Arnold Lazarow Professor and Head	Departmental Program Project Multi-discipline Diabetes Research Project	$120,937	Federal
" "	Departmental Diabetes Research Training Grant	78,457	Federal
" "	Fetal Endocrinology	35,464	Federal
" "	Diabetes Literature Retrieval	171,200	Federal
" "	Departmental Anatomical Sciences Training Grant	97,465	Federal
" "	Diabetes Related Literature Current Awareness Bulletin (University of Minnesota, University of Rochester and Western Reserve University).	17,849	Federal
Dean E. Abrahamson Assistant Professor	The Application of Quantitative Microspectrophotometry and the Evaluation of Normal and Malignant Tissue in Thin Sections	8,740	Private
" "	The Application of a Computer-linked Microspectrophotometer to the Quantitative Evaluation of Normal and Abnormal Tissue in Thin Sections	2,500	State
G. Eric Bauer Assistant Professor	Studies on the Synthesis of Secretory Proteins	11,070	Federal
H. David Coulter Instructor	Structure and Chemical Organization of Biological Membranes	5,000	State
" "	Studies on Communication Between Cells	5,380	Private
Padmakar K. Dixit Associate Professor	Mode of Action of Vitamin D (Mechanism of Calcification of Rachitic Cartilage Induced Vitamind D and Starvation).	2,000	State
" "	Research on Citrate Metabolism in Diabetes	1,350	Private
Joseph L. Rigatuso Assistant Professor	Electron Microscopic-Histochemical Study of Microbody Formation in Regenerating Rat Liver	1,000	State
[illegible]ald W. Robertson Assistant Professor	Effects of Maternal Hypoglycemia	1,100	Private

DEPARTMENT OF ANATOMY RESEARCH AND TRAINING GRANTS (Continued)

Principle Investigator	Title	Amount	Source of Funds
Morris Smithberg Associate Professor	Environmental Influences on Development of Mice	3,000	State
Robert L. Sorenson Instructor	Studies on Isolated Islets and Isolated Insulin Secretion Granules.	2,000	State
Richard L. Wood Associate Professor	Cytodifferentiation in Embryonic and Fetal Liver.	26,809	Federal

Federal Research and Training Grant Support	559,251
State Research Support	15,500
Foundation Research Support	16,570
TOTAL	$ 591,321

Research Facilities

The departmental facilities include: air-conditioned animal quarters housing many varieties of animals, a walk-in cold room, a tissue culture laboratory, a radioisotope laboratory, and many other laboratories housing specialized facilities. Equipment includes several electron microscopes, automatic radioactive counters, spectrophotometers (including an infrared spectrophotometer), electron component quantitators, preparative ultracentrifuges, photographic equipment and many other specialized items of equipment. Specific equipment items are linked to the computer at the Biomedical Computing Center. Our current research facilities include:

Type of Laboratory	No.	Square Feet
Faculty and Graduate Student Laboratories	36	10,342
Research Support Laboratories (Electronics, Instrumentation, Isotopes)	7	2,182
Laboratories for Animals	8	2,591
TOTAL		15,115 sq. ft.

DEPARTMENT OF ANESTHESIOLOGY

Research Program - In general the department is concerned with two objectives:

1. Research training in anesthesiology
2. The accomplishment of specific research projects of both a clinical and basic nature.

Research training provides selected candidates with opportunities to pursue basic training in pharmacology and allied basic sciences (biochemistry, physiology and biostatistics). Extensive clinical training in anesthesiology is a prerequisite. The interdisciplinary environment established at the outset of the program continues to foster development of academically oriented anesthesiologists.

More specifically, our training plan is geared for development of Clinical Pharmacologists in Anesthesiology. Trainees enroll in the same didactic courses, seminars and laboratory sessions as graduate students in pharmacology. Suitable research projects are selected conjointly by the Program Director, Principal Basic Sciences Advisor and Thesis Advisory Committee after consideration of the trainees' interests and technical capabilities. A Ph. D. in Pharmacology is a natural consequence of this training.

Currently - specific research projects involve investigations into drug metabolism, elevation of cardiac fibrillation thresholds, effects of mechanical lung ventilation on pulmonary hemodynamics, post-operative respiratory impairment, and the evaluation of pulmonary function in patients with various lung diseases. Research fellow work under the direction of competent senior investigators can qualify for a Master's Degree upon submission of a thesis and satisfactory performance in a written and oral examination.

Individuals currently involved in research from the Department of Anesthesiology:

F. H. Van Bergen, Professor and Head
J. J. Buckley, Professor
H. D. Westgate, Associate Professor
J. S. Rydberg, Assistant Professor
J. F. Cumming, Assistant Professor
Alexander Yue, Research Fellow
Byron Johnson, Research Trainee
Douglas Berry, Research Trainee

Research Space Available:

Diehl Hall	F103	245 sq. ft.
	F104	104 sq. ft. (some study area for research fellows)
	F104 1	152 sq. ft.
	F104 2	505 sq. ft.
Mayo Mem	B199	216 sq. ft.
Millard Hall	Some limited space available to fellows in Ph. D. program	

Investigator	Title of Project	Source of Fund	Amount
F. H. Van Bergen	Research Training in Anesthesiology	Institute of General Medical Sciences	$25, 544 (1968-69)
" " "	A Functional Assessment of Mechanical Respirators	Health Services and Mental Health Administration	14, 209 (1968-69)
J. J. Buckley	Assessment of Postoperative Ventilatory Insufficiency	Public Health National Heart Institute	11, 200 (1968-69)
Department of Anesthesiology	Anesthesiology Special Research	Private	Gifts from former fellows and memorials
Department of Anesthesiology	Anesthesia Associates	Private	" " "

PENDING

J. J. Buckley,	Evaluation of New Antiarrhythmia Drugs in Hypothermia	Public Health Service
F. H. Van Bergen	Research in Anesthesiology	Institute of General Medical Sciences
H. D. Westgate	Cardiopulmonary Function Changes in Scoliosis	Orthopedic Research and Education Foundation

DEPARTMENT OF BIOCHEMISTRY

There are 10 persons at the rank of Assistant Professor or above funded through the department. In addition, 10 other persons at these ranks, funded via other departments and sources, contribute significantly to our research, teaching and service enterprises.

The teaching is intended to furnish a broad coverage of the basic aspects of biochemistry at the cellular and molecular levels with emphasis on biochemistry as an experimental and rapidly evolving science. An equally important objective of our major courses (for medical and dental students) is attention to disturbances of biochemical processes in disease. Separate courses are given to students of: Medicine, Dentistry, Nursing (2 courses), Medical Technology and to Graduate Students. The graduate student courses are a 3-term survey course and 7 advanced level and specialized courses. Five of the latter are given in alternate years.

The research work in the department is varied in that each senior staff person develops a unique field for investigation. Fields of biochemistry represented at the research and graduate institution levels are: Metabolic enzymology, Calcified tissues, Protein biosynthesis, Physical biochemistry; Steroid hormone metabolism, Protein-polysaccharide structure and metabolism, guanido compound metabolism, Metal-protein interactions, Biochemical genetics, Structure and function of proteins, Cholesterol biosynthesis.

The department of Biochemistry research is funded from the Public Health Service in all but one instance. This exception is a contract from the American Cancer Society. The total amount of funds available for research from these sources is $666,441.00.

DEPARTMENT OF BIOCHEMISTRY

Principal Investigator	Title
H. R. Gutman	Professor
J. F. Van Pilsum	Associate Professor
U. S. Seal	Lecturer
J. F. Koerner	Associate Professor
D. B. Wetlaufer	Professor
W. D. Armstrong	Professor and Head
L. Singer	Professor
M. E. Dempsey	Assistant Professor
J. Larner	Professor
F. Ungar	Professor
R. D. Edstrom	Assistant Professor
F. Wold	Professor
C. W. Carr	Professor
J. W. Bodley	Assistant Professor

Princ. Invest.	Title	Source
H. R. Gutman	Carcinogenic	PHS
J. F. Van Pilsum	Guandidinium Compound Metabolism	PHS
U. S. Seal	Cortisol Binding Protein	PHS
J. F. Koerner	Protein Synthesis following Bacteriophage Infection	PHS
D. B. Wetlaufer	Energetics of Protein Structure	PHS
W. D. Armstrong & L. Singer	Fluoride Metabolism	PHS
M. E. Dempsey	Enzymic Cholesterol Synthesis	PHS
J. F. Koerner	Deoxyribonuclease from Escherichia Coli	PHS
J. Larner	Chemical Mechanisms of Action of Insulin	PHS
J. F. Van Pilsum	Training Program in Biochemistry	PHS
F. Ungar	Cancer Research Training in Steroid Biochemistry	PHS
R. D. Edstrom	Metabolism of Amino heturic Acids	PHS
F. Wold	Protein Structure and function	PHS
D. B. Wetlaufer	Research on Structural & Stability of Nerve Memoranes	PHS
C. W. Carr	Ion Binding Studies	PHS
J. W. Bodley	Transcription & Translational Processes	ACS

Pending

J. W. Bodley	Translational Processes	ACS-PHS
F. Ungar	Cancer Research Training in Steroid Biochemistry	PHS
F. Ungar	Estrogen Induction of Adrenal Enzymes with mouse tumor virus	PHS
F. Ungar	Regulation of Steroid Sex Hormone Production	PHS

Total Research Space - 14,686 Sq. Ft.

UNIVERSITY OF *Minnesota*

MEDICAL SCHOOL · DEPARTMENT OF MEDICINE
DIVISION OF DERMATOLOGY · MINNEAPOLIS, MINNESOTA 55455

June 2, 1969

Robert O. Mulhausen, M.D.
Assistant Dean
College of Medical Sciences
1360 Mayo

Dear Dr. Mulhausen:

I am responding to your inquiry of May 19, 1969 in connection with the NIH grant application for the development program. Item #1. The following research activities are currently being carried on:

Biochemistry

Carbohydrate metabolism relative to the skin (especially glucose and glycogen.)
Connective tissue metabolism (especially collagen - normal, disease states, wound healing.)
Histochemistry - application of new methods in the review of diseases previously studied.
Photobiology (especially protoporphyria and sunscreening in various disease states.)

Electron Microscopy of Skin (especially pigment cells)

Immunology of the Skin

Leprosy - electrophoresis in various clinical types.
Tissue reaction in inoculated animals.
Relation between antigens of ocular lens and skin.
Immunological reactions of drug sensitivities (especially regarding mast cells.)
Immunofluorescence of patients with lupus erythematosus and with various vesicular and bullous diseases.

Alvin S. Zelickson, M.D. Associate Professor	Training Grant in Dermatology	U S P H S $105,000 - 3 yrs.)
Alvin S. Zelickson, M.D. Associate Professor	The Melanocyte and Langerhans Cell	U S P H S (not funded)
Alvin S. Zelickson, M.D. Associate Professor	Support of Electron Microscopist	Minnesota Medical Foundation ($6,000)
Francis W. Lynch, M.D. Professor & Head	Dermatologic Research Fund	Hill Family Foundation ($6,500)
Francis W. Lynch, M.D. Professor & Head	Dermatology Training Program	Hill Family Foundation ($1,500)
Francis W. Lynch, M.D. Professor & Head	Acne Study	Fuller Pharmacy Company ($1,500)
Francis W. Lynch, M.D. Professor & Head	Dermatology Research	Duke-Lab Foundation ($5,000)
Francis W. Lynch, M.D. Professor & Head	Histopathology Laboratory	($18,000)
Ramon M. Fusaro, M.D.,Ph.D. Associate Professor	Erythropoetic Protoporphyria (R.M. Fusaro & Samuel Schwartz)	N I H ($50,516 - 3 yrs.)
Ramon M. Fusaro, M.D.,Ph.D. Associate Professor	Immunology of Lens and Skin (R.M. Fusaro & William B. Rathbun)	N I H ($48,831 - 3 yrs.)
Ramon M. Fusaro, M.D.,Ph.D. Associate Professor	Ultraviolet Light Protection	Minnesota Medical Foundation or Richardson Merrell (not funded)
Ramon M. Fusaro, M.D.,Ph.D. Associate Professor	Development of Ultraviolet Protection in an Animal Model	Private (not funded)
Ramon M. Fusaro, M.D.,Ph.D.	Treatment of Acne with Antibiotics	Upjohn Company ($6,000)

Item #1

a. In-patient consultations, 5 out-patient clinical sessions per week, 8 in-patient beds. Diagnostic laboratory facilities include dark-field examinations, mycology, a histopathology laboratory.
b. Hospital patients are those with major dermatologic ills of all types.
c. Currently 90 senior students per year in the out-patient department and 80 junior students per year.

Item #2

After new space development is expected there will be teaching of 200 students per year in the second and third year programs and 120 per year in the fourth year program. Graduate students will probably number 18. Faculty status is impossible to estimate.

DEPARTMENT OF LABORATORY MEDICINE

Report on Research Program

The major research effort in the Department of Laboratory Medicine which will make use of the projected facilities include the following.

1. Structure and function of heart and skeletal muscle cells in health and disease. Investigators: Drs. Ellis Benson, Andreas Rosenberg, Mary Dempsey, Nancy Staley, Moon Han, Karim Ahmed, and Mr. Ben Hallaway. These studies include: (1) the role of the intracellular and intercellular membranes in excitation and contraction coupling in heart muscle cells. (2) The function of the Z line and abnormalities in the Z line in abnormally functioning muscle cells. (3) Differences in structure and function and enzymatic activity between cardiac and skeletal contractile proteins including myosin, actin, tropomyosin, and troponin. (4) The role of actin conformation change in muscular contraction and (5) binding interactions of calcium and other metal ions with myosin, actin tropomyosin and troponin and their relationships to muscular contraction.

2. Cellular and molecular studies on immunological tolerance and the role of the thymus. Investigators include Edmond Yunis, Osias Stutman, and Miguel Azar. The role of the thymus and other central lymphoid organs in the development of immunological tolerance is under study. The effect of thymic cells and cell free extracts in the production of immunological competence and tolerance is also studied. Carcinogen induced thymomas and their role in immunological function is included in this overall study.

3. Tissue transplantation antigens and antibodies. Investigator, Edmond Yunis. A study of improved means of tissue histocompatibility matching by laboratory techniques is the aim of this project.

4. DNA replications in developing mammals and the role of constitutive heterochromatins in developmental biology. Investigators, Jorge Yunis and Walid Yasmineh. A study of the role of heterochromatin in patterns of chromosomal replication and in normal and abnormal functional states is included. DNA replication patterns are related to abnormal chromosome patterns.

5. Studies on platelet factors in coagulation. Investigator, J. Roger Edson. A study of the interconversions of platelet factor 3 and their relationship to blood coagulation in normal and in abnormal states is included.

6. Studies on complement. Investigator, Henry Gewurz. The role of complement in inflamation and in tissue transplantation and in blood coagulation is being investigated. The discreet role of various complement factors in a variety of abnormal states is included in this study.

7. Mechanism of hydrogen exchange in proteins. Investigators, Andreas Rosenberg, Ellis Benson, Ben Hallaway. The relationship between protein conformation and kinetics of exchange in aqueous medium is under study. The "motility" of protein, as detected by exchange properties, may have important bearing on such biological events as muscular contraction, antibody-antigen reaction and the interaction of heme proteins with oxygen and other ligands.

Research Space Available

Room Number	Sq. Ft.	Laboratory
C 208	270	Chemistry
C 210	150	Chemistry
C 211	210	Chemistry
C 213	170	Chemistry
C 215	170	Chemistry
C 216	110	Chemistry
C 289	350	Chemistry
C 290	150	Chemistry
C 242	150	Hematology
C 244-1	150	Hematology
L 237	200	Immunology
Diehl Hall	1350	Dr. Vernier, Ben Hallaway
203		Electron Microscopy
224		Protein Chemistry

Principal Investigator	Title	Amount	Source
Miguel Azar, Medical Fellow	Cellular & Molecular Studies	$ 1,500	Minn. Med. Found.
	Mechanism of Immunological Tolerance	36,354 (3 yr.) 13,732 (1st yr.) + $15,953	NIH-pending
	Cellular & Molecular Basis of Immunological Tolerance	5,850 ($7,020)	Arthritis Found. - pending
	Nature of Immunological Tolerance	5,570	AMERICAN Heart-pending
	Nature of Immunological Tolerance	5,700	Grad. Sch. Pend.
Mary Dempsey, Assistant Professor	Studies of the Enzymic Reactions of Muscle Contraction	11,000	
David Brown, Assistant Professor	Interrelationships of Calcium, Phosphorus and Amino Acid Transport	2,800	Grad. School
J. Roger Edson, Assistant Professor	Platelet factor 3 rapid availability (RA) factor.	7,074	Minn. Heart - pending
	Further Investigation of newly recognized plasma factor necessary for platelet factor	2,588	Grad. Sch. Pend.
Grace Ederer Associate Professor	Evaluation and implementation of modified Pronase B method for extraction of the "C" carbohydrate of beta-hemolytic streptococci for use in the precipitin grouping reaction in a clinical laboratory.	2,300	Grad. Sch.

Principal Investigator	Title	Amount	Source
J. Roger Edson, Assistant Professor	Investigation of newly recognized plasma factor necessary for platelet factor 3 availability.		
Ellis S. Benson, Professor and Head	Pathology of Myocardial Cell	$29,124 (34,949)	NIH
		25,553 (30,664)	
	Motility of Myocardial Proteins in Health and Disease	19,811 (25,266)	NIH
	Hydrogen Exchange Studies of Protein Structure	19,252 (24,778)	NIH
		20,700 (26,468)	
Esther Freier, Professor	Development and Evaluation of Clinical Chemistry Methodology	2,100	Grad. Sch. Pend.
	Development and Evaluation of Clinical Chemistry Methodology	2,500	Grad. Sch.
John Matsen, Assistant Professor	Enteric Bacteria in Hospital Infections	1,565	Grad. Sch. Pend.
	Study of Sod. Colistimethate Disc. Eval.	3,000	Warner-Lambert
	Study of Ampicillin Kanamycin	2,500	Bristol
	Susceptibility testing of lincomycins analogs	2,400	Upjohn

Principal Investigator	Title	Amount	Source
John Matsen, Assistant Professor	Study of Antibiotic Cephalexin	$17,534	Lilly
Andreas Rosenberg Associate Professor	Thermodynamics of C++ binding to skeletal and heart myosin	4,267	Minn. Heart
	Research on Divalent Cations	18,901 (24,387)	NIH
	Quan. Stud. of Ca++ binding to purified myosin from skeletal and cardiac muscle	1,100	Grad. Sch.
Lorraine G. Stewart Associate Professor	Studies on Hypocoagulability induced by antivitamin K compound	869 (1,000)	
Paul Strandjord, Associate Professor	Serum Enzymes, Proteins and Pigment in Liver Disease	21,324 (27,033)	
	Kinetic Studies of Acid Phosphatase	2,000	Grad. Sch.
Osias Stutman, Instructor	Faculty Research Award	91,662 (101,281) 5 yr.	American Cancer-pend.
	Resistance to Carcinogens and Immunefunctions	36,048 (44,028)	NIH - pend.
	Anemia and Induced Thymomas in Mice	4,114	Grad. Sch.
	Carcinogen Induced Thymomas and Thumic Function	4,745	Grad. Sch.-pend.
	Studies of Resistance to Carcinogens	106,000 to 180,000 (3 yr.)	American Cancer-Pend.

Principal Investigator	Title	Amount	Source
Edmond Yunis, Professor	Carcinogen Induced Thymomas	19,544 (25,109)	NIH
	Tissue Transplant Contract	55,426	NIH
	Blood Group Isoantigens and Leukemic and Cancer Cells	13,283 (16,779)	
	Autoimmunity in relationship to immunologic deficiencies produced by thymectomy or occurring spontaneously during aging.	2,000	Grad. Sch.
	Autoimmunity in relationship to immunologic deficiencies produced by thymectomy or occurring spontaneously during aging.	4,081	Grad. Sch. Pend.
Walid Yasmineh, Assistant Professor	Congenital hereditary defects in the metabolism of glucose in human erythrocytes	1,970	Grad. Sch.
	The identification of satellite DNA with constitutive heterochromatin in mammals.	2,725	Grad. Sch. Pending
Jorge Yunis, Associate Professor	DNA Replications in developing and and Mature Mammals	20,152 (25,927)	
	Constitutive Heterochromatin and RNA Synthesis	24,200 (29,991)	NIH Pend.

RESEARCH PROGRAM - DEPARTMENT OF MEDICINE

It is the objective of the Department of Medicine to maintain a balanced research program in the belief that teachers who have an active interest in investigation are stimulating and productive. To achieve this objective, an attempt has been made to build strong programs in each of the various areas of Medicine. The Department is divided into sections such as hematology, cardiology, gastroenterology, etc. In general, the head of the section is responsible for the research and teaching program in his area. The research in each section is supported by several research grants. A training grant, if available, permits the development of research talent in those graduate students in the Department who have an interest in research.

In addition to the research program at the University Medical Center, the Department also has a strong program at the Veterans Hospital under the direction of Dr. Leslie Zieve. An attempt has been made to integrate the graduate training and research programs at the University Medical Center and the Veterans Hospital. An example of such an integration is the newly-developed program in hematology.

Research in Gastroenterology

The program in gastroenterology is under the direction of Dr. James Carey. This is a very active program, with emphasis on metabolism of bile acid. Studies on damage to the liver from lithocholic acid have been of particular interest. Other projects in the section include studies on immune mechanisms and liver disease by Dodd Wilson and intestinal gas by Michael Levitt. The section has a very active training program, and has succeeded in recruiting some very fine young

men. The program is supplemented by a large research program directed by Dr. Leslie Zieve at the Veterans Hospital.

Endocrine and Metabolism

Dr. Richard Doe has taken responsibility for endocrinology and metabolism, both at the University Medical Center and at the Veterans Hospital. Beginning July 1, 1969, he will be full time at the University Medical Center. His interests have been largely related to the steroid hormones, and particularly to protein binding of these hormones in the plasma. Frederick Goetz is program director of the Clinical Research Center. His major interest has been diabetes mellitus. One of his projects relates to the mechanism of release of insulin from the mammalian pancreas. He is also involved in a cooperative study on the relation of treatment to complication of diabetes. Dr. Goetz works closely with Dr. Jonathan Bishop who is also on the staff of the Clinical Research Center. Dr. Bishop is in the Department of Medicine. He was formerly in the Department of Biochemistry where he worked closely with Dr. Joseph Larner. Dr. Bishop has a particular interest in the enzymes related to glycogen metabolism and the relation of these enzymes to insulin resistance. Dr. Edward Wong is also associated with this group. His research interests have been in LATS and its detection by immunologic means. The endocrine group plans a very active training program.

Section of Cardiology

Dr. Ivan Frantz is Clark Research Professor of Medicine. He carries on a large program in research related to coronary athero-

sclerosis. He has had a long-standing interest in metabolism of cholesterol. In addition, he is engaged in a large-scale study of the effect of dietary change on human cardiovascular disease. This study is carried out in six mental hospitals in the state of Minnesota. The purpose of this study is to determine whether lowering blood cholesterol by dietary means will influence the incidence of the clinical manifestations of coronary disease. Other projects include the use of the computer and the study of electrocardiography by Dr. Tuna, the effect of exercise on hemodynamics by Dr. Wang, the study of expenditure of cardiac energy for pulsatile flow by Dr. Jorgensen, and the study of the inotropic effect of certain nondigitalis compounds by Dr. From. In addition, there is a large clinical training program in cardiology headed by Dr. Howard Burchell and Dr. Yang Wang.

Renal Section

Dr. Louis Tobian is responsible for this section. He has a distinguished record of research in hypertension and renal disease. In the past he has had a major interest in the juxtaglomerular apparatus and renin secretion. At the moment he is studying the lipid granules in the interstitial cells of the renal papillae with particular interest in their chemical composition in relationship to hypertension. On July 1 Dr. Kunau will join the faculty. He is coming from Southwestern Medical School where he has worked with Donald Seldin. His interest is in renal micropuncture and the use of this technique in the study of sodium excretion. Dr. John Levitt is also associated with this section. He is studying the regulation of phosphate excre-

tion in uremic man. Dr. Kjellstrand is responsible for renal dialysis and is carrying on a study on the pathogenesis of hypertension in dialyzed uremic patients.

Section of Hematology

The hematology section has a strong research program headed by Dr. Harry Jacob. Dr. Jacob has varied interests including studies of red cell membrane defects, the study of the unstable hemoglobins and bone transplantation in hematologic malignancies. Dr. Manuel Kaplan is joining the faculty in June 1969. He will be responsible for the hematology section at the VA Hospital but will also be closely associated with Dr. Jacob at the University Medical Center. His field of interest is immunohematology and he is now studying the structure and biologic activity of isohemagglutins. Dr. Samuel Schwartz is the career investigator of the National Institutes of Health, and is full time in research. He has a record of distinguished investigation in porphyrin metabolism.

Chest Disease Section

Dr. Richard Ebert has a research project on the use of radioactive xenon, the scintillation camera, and the computer in the recognition of areas of decreased ventilation and perfusion. The intent is to develop this method to permit its use in epidemiologic studies of emphysema. These studies will be performed in conjunction with a group in the Department of Physiological Hygiene. Work in this area is being done in conjunction with the Department of Radiology. Dr.Richard

Kronenberg will join the group on July 1, 1970. At present he is working with Dr. Severinghaus at the Research Institute at the University of California. His interest is in the regulation of respiration with particular emphasis on the role of hypoxia. He will continue these studies when he returns to the University of Minnesota. In addition, there is a large active group in pulmonary disease at the Veterans Hospital.

Section on Infectious Disease

Dr. Wesley Spink is responsible for the program in this area. Dr. Spink has a distinguished record of investigation and continues to be very active in research. He will, however, retire in a few years and it will be necessary to re-structure the section at that time. Dr. Wendell Hall, Chief of Service at the VA, has a primary interest in infectious disease and continues a strong research program.

Section on Arthritis and Immunology

Dr. Ralph Williams had a very strong research program in this area; unfortunately, he left the University of Minnesota recently to accept the position as Chairman of the Department at the University of New Mexico. A search is being conducted for his successor.

Section on Oncology

Dr. B. J. Kennedy has had a strong program in oncology for several years. A special hospital (The Masonic Hospital) is devoted to the care of cancer patients. Included in this hospital are extensive

laboratory facilities for research. Dr. Kennedy's major interest has been in agents used for chemotherapy of cancer. He has been assisted by Dr. Fortuny and Dr. Theologides.

Programs in Clinical Pharmacology and Medical Genetics

Dr. Hunninghake is developing a strong training program in clinical pharmacology. This program is operated jointly by the Department of Pharmacology and by the Department of Medicine. At the present time Dr. Hunninghake has his major research facilities located within the Department of Pharmacology. However, in the plans for the new building space is included for Clinical Pharmacology. His research interests include a study of drugs influencing the level of lipids in the plasma and drug interactions.

At the present time there is no one in the Department with a primary interest in medical genetics; however, Richard King will join our faculty in 1971. He has completed a medical residency and is completing a PH.D. in genetics. During the next two years he will be associated with the atomic bomb project in Japan. He will establish a program in medical genetics when he returns.

Number of faculty members engaged in research -

12 - Professors
7 - Associate Professors
9 - Assistant Professors
2 - Instructors
3 - Research Associates
1 - Clinical Assistant Professor

Department of Medicine space by Sections:

1836 sq. ft.	- Renal
1756 sq. ft.	- Oncology
1402 sq. ft.	- Infectious Disease
3173 sq. ft.	- Hematology
1472 sq. ft.	- Endocrine-Metabolism
1443 sq. ft.	- Cardiology
1637 sq. ft.	- Cardiac Research
2367 sq. ft.	- Gastro-Intestinal
1452 sq. ft.	- Departmental
16,538 sq. ft.	- total space - research only

RESEARCH PROGRAMS

PRINCIPAL INVESTIGATOR	TITLE OF PROJECT	AMOUNT	SOURCE OF FUNDS (i.e.private or federal)
Richard V. Ebert	Recognition of Emphysema with a Scintillation Camera	$20,000	Federal
J. B. Carey, Jr.	Metabolism of Bile Acids	11,790	Federal
J. B. Carey, Jr.	Training Grant in Gastroenterology	49,446	Federal
J. B. Carey, Jr.	Prevention of Hepatitis After Cardiovascular Surgery	27,600	Federal
J. B. Carey, Jr.	Guar Gum Study	500	Private
J. B. Carey, Jr.	Mead Johnson - Cholestyramine Study	1,000	Private
I. Dodd Wilson	Immunoglobulins and Stomach, Liver & Intestine	13,703	Federal
I. Dodd Wilson	Serum Anti-IgA Factors (Beginning July 1, 1969)	2,880	Private
M. D. Levitt	Use of Intestinal Gas for Diagnosis of G.I. Disease	13,729	Federal
M. D. Levitt	Gas Chromatography Apparatus	1,850	State
Harry Jacob	Therapeutic Bone Marrow Transplantation in Hematologic Malignancies	50,919 (2yrs)	Private
Harry Jacob	Abnormal Blood Cell Membranes in Disease	19,146	Federal

Harry Jacob	Congenital Lysosomal and Red Cell Membrane Defects	$72,694	Federal
Harry Jacob	Effects of Therapeutic Irradiation on Blood Cell Membranes	3,000	Private
Glenn Rodey	Therapeutic Bone Marrow Transplantation in Hematologic Malignancies	3,000	Private
Harry Jacob	Role of Altered Erythrocyte Membrane Physiology	5,000	State
Harry Jacob	Role of Altered Erythrocyte Membrane Physiology in Hemolytic Diseases	1,300	State
Harry Jacob	Mechanism of Blood Cell Damage by Irradiation	3,000	Private
Harry Jacob & Manuel Kaplan	V.A. Training Grant in Hematology	79,188	Federal
Glenn Rodey	Investigation of Abnormal Lysosomal Membrane	6,250	State
Harry Jacob	Bone Marrow Transplantation in Hematologic Diseases	3,000	Private
Louis Tobian	Pathogenesis of Arterial Hypertension	73,800	Federal
Louis Tobian	Natriuretic Hormones of non-renal origin	11,000	Private
Louis Tobian	Cardiovascular Disease (Training Grant)	31,834	Federal
Silvia Azar	Lipid Granules & E. Prostaglandins of Renal Papilla	3,395	Private

Masao Ishii	Relation of renal medullary interstitial cells to hypertension	$ 2,970	Private
J. Levitt	Correlation of serum ketone bodies and uric acid uremia	2,545	Private
Masao Ishii	Renal Interstitial cell granules in hypertension	4,500	Private
Silvia Azar	Lipid granules and E. prostaglandins of renal papilla	3,500	Private
J. Levitt	Causes of acidosis in renal insufficiency	11,040	Federal
J. Levitt	Regulation of phosphate excretion in uremic man	5,650	Private
C. Kjellstrand	Pathogenesis of Hypertension in Dialyzed Uremic Patients	3,890	Private
R. Kunau	Intrarenal distribution of the glomerular filtrate	6,367	Federal
L. Tobian	Pathogenesis of Arterial Hypertension	73,538	Federal
Naip Tuna	Computer Analysis of Vectorcardiogram	45,094	Federal
I. D. Frantz, Jr.	Effect of a Dietary Change on Human Cardiovascular Disease	618,652	Federal
I.D. Frantz, Jr.	Intermediary Metabolism of Cholesterol	40,918	Federal
I.D. Frantz, Jr.	Cardiovascular Disease (Training Grant)	31,834	Federal
I.D. Frantz, Jr.	Regulatory Mechanisms in Cholesterol Metabolism	9,900	Private

Yang Wang	Coronary Blood Flow Studies and Tension-time Index in Man	$18,315	Federal
B.J. Kennedy	Medical Oncology Research	16,000	Private
M. J. Murray	The Role of Gastric and Intestinal Secretions in the Regulation of Iron Absorption	30,540	Private
M. J. Murray	Gastric and Intestinal Secretions in Iron Absorption	23,527	Federal
S. Schwartz	Research Career Award	25,000	Federal
S. Schwartz	Metabolic studies of bovine porphyria	29,000	Federal
S. Schwartz	Non-Hb Heme Precursors of bile and urinary pigments	29,000	Federal
S. Schwartz and R. Fusaro	Protoporphyria: Enzyme and Porphyrin Studies	14,000	Federal
S. Schwartz	Porphyrin and Cancer Studies	2,000	Private
S. Schwartz	" " " "	3,000	State
W. W. Spink	Brucellosis Research Unit	15,000	State
W. W. Spink	Endotoxin Shock - USPHS	26,495	Federal
W. W. Spink	Allergy and Immunology - USPHS	71,812	Federal

R. P. Gruninger	Eli Lilly and Company Research on Antibiotics	$ 9,840	Private
R. P. Gruninger	Minnesota Heart Assn. Research on Effect of Vaso-activators	2,000	Private
M. N. Blumenthal	Disodium Cromoglycate Study - Hazelton Laboratories	12,000	Private
M. N. Blumenthal	Hoffman-LaRoche, Inc. Anti-histamine Study (pending)	5,000	Private
C. J. Watson	Chemistry and Biogenesis of the Urobilins	14,315	Federal
C. J. Watson	Chemistry and Biogenesis of the Urobilins	20,089	Federal
C. J. Watson	The affinity of uroporphyrin and its zinc complex for neuclear elements, especially nucleohis-tone, both in normal and neo-plastic cells	42,260	Private
C. J. Watson	McNeil Laboratory Research on Griseofulvin	5,000	Private
C. J. Watson	John H. Briggs Research on Porphyria	5,000	Private
C. J. Watson	Sigma Delta Tau Research in Blood	1,200	Private
C. J. Watson	Louis Weinberg Liver Disease Research	1,500	Private
C. J. Watson	Reimers Medical Research Fund	1,000	Private
C. J. Watson	Fred Stacy Heintz Research	1,500	Private
F. C. Goetz	Secretion of Insulin by the Pancreas 0688-5224	47,496	Federal
F. C. Goetz	Relation of Treatment to the Complications of Diabetes 0688-5205	50,243	Federal

F. C. Goetz	Training Grant in Diabetes & Endocr. 0900-4054	$25,960	Federal
F. C. Goetz	Frenzel Fund 0688-5957	500	Private
F. C. Goetz	Dymelor & Tolbutamide (Eli Lilly) 0688-5733	6,250	Private
E. T. Wong	LATS Detection by Immunological Means 0688-5276	12,395	Federal
E. T. Wong	Graduate School Grant 482-0303-4909	1,500	Private
M. E. Jacobson	Research on Assay of Renin Activity (MHA) 680-0688-5872	3,500	Private
J. S. Bishop	Insulin Resistance & Enzymes of Liver Glycogen 0688-5279	14,729	Federal
J. S. Bishop	Research in Endocrinology (Hill Foundation) 68Y-0688-5879	17,318	Private
J. S. Bishop	Research in Diabetes (Twin Cities Diabetes Assoc) 0688-5997	5,000	Private
J. S. Bishop	Research in Diabetes (American Diabetes Assoc) 0688-5998	5,000	Private
R. Derr	The Cause and Prevention of Aminonucleoside Nephrosis	22,459	Federal
C. Alexander	The Effect of Chronic Alcohol Administration on the Heart	60,120	Federal
W. Hall	Penicillin and Other Antibioties	10,757	Private
W. Hall	Wyeth Laboratories Research Scholarship	1,500	Private
W. Hall	Wyeth Laboratories Unrestricted	3,000	Private

J. Jenne	An Animal Model for Chronic Infective Bronchitis	$17,701	State
F. Nuttall	Cardiac Muscle Function in Myxedema & Thyrotoxicosis	515	State
M. Kaplan	Structure & Biologic Activity of Isohemagglutininins	22,595	Federal
K. Ansari (Pend.)	Development of a Specific Immunological Test for Diagnosis of Multiple Sclerosis	11,323	Private
		$2,133,226	
	Private	315,137	
	Federal	1,818,089	

DEPARTMENT OF MICROBIOLOGY

EXTENT & OBJECTIVES OF THE DEPARTMENT

The Department of Microbiology will continue to develop and emphasize the quantitative molecular biologic aspects of the science. Physiology, genetics and developmental biology will be continually strengthened. At the same time, however, the Department will not lose sight of the fact that microorganisms do produce disease, and although some of the host-parasite relationships are complex, there is much useful information to be gained somewhat above the molecular level.

The Department maintains strong teaching and research programs at the graduate level, along with an interest in and strengthening of medical school education. The teaching of medical students is a primary function of the department, and the Department has recognized the changing trends in this area.

Under its present administration, the Department will maintain a balance among the various phases of microbiology--basic, applied, clinical--both through primary staff appointments as well as through the concept of joint appointments of microbiologists in other departments. Too, it will continue its present balance between teaching and research.

STAFF

Number of Individuals and Academic Rank

4 Professors (primary appointments)
7 Professors (joint appointments)

4 Associate Professors (primary appointments)
6 Associate Professors (joint appointments)

3 Assistant Professors (primary appointments)
2 Assistant Professors (joint appointments)

1 Instructor (primary appointment)

Source and Amount of Funding

Complete departmental resources total approximately $875,000 annually; of this amount 75% comes from federal sources and 25% from the state.

Salary sources and amounts for the primary staff appointments are as follows:

4 Professors	95% State	5% Federal
4 Associate Professors	37% State	63% Federal
3 Assistant Professors	57% State	43% Federal
1 Instructor		100% Federal

DEPARTMENT OF MICROBIOLOGY

Principal Investigator	Title
Dennis W. Watson	Professor and Head
Gerhard K. Brand	Professor
Louis H. Muschel	Professor
E. L. Schmidt	Professor
R. W. Bernlohr	Associate Professor
Martin Dworkin	Associate Professor
Palmer Rogers	Associate Professor
R. C. Johnson	Assistant Professor
Y. B. Kim	Assistant Professor
Peter G. Plagemann	Assistant Professor

Principal Investigator	Source	Title of Project	Amount	Period of Support
Dennis W. Watson	NIH	Host-parasite relations among group A streptococci	$115,285	5 years
	"	Ontogeny of the Immune Response	96,325	5 years
	"	Immunochemistry of Bacterial Toxins	96,520	5 years
	NIH	Training Grant in Allergy and Immunology	674,474	5 years
	"	Training Grant in Microbiology	294,774	5 years
Gerhard K. Brand	"	Polymer solid state carcinogenesis	246,830	5 years
Louis H. Muschel	"	Microbial & Mammalian Tissue Antibody Studies	181,298	3 years
E. L. Schmidt	NSF	Application of immunofluroescent staining techniques to the ecology of soil microorganisms	45,000	2 years
R. W. Bernlohr	NIH	RCDA - Metabolic basis of spore formation	Varies	5 years
	NIH	Metabolic Basis of Spore Formation	174,405	5 years
	NSF	Control of metabolism during sporulation of Bacillus	35,100	2 years
Martin Dworkin	NIH	RCDA - Developmental physiology of fruiting myxobacteria	Varies	5 yrs.
	NIH	Developmental physiology of the fruiting myxobacteria	95,012	3 years
Palmer Rogers	AEC	Canavanine death and mechanism of DNA replication in E. coli	19,000	1 year
	NSF	Regulation of specific messenger RNA synthesis	46,700	2 years
R. C. Johnson	NIH	Physiology of pathogenic and saprophytic leptospirae	65,000	3 years
	NIH	Comparative studies of parasitic spirochetes	59,262	3 years
Y. B. Kim	NIH	RCDA - Ontogeny of the immune response	Varies	5 years
Peter G. Plagemann	NIH	Mengovirus replication in rat hepatoma cells	199,135	5 years
Pending				
D. W. Watson	NIH	Training Grant in Allergy & Immunology	745,529	5 years
	NIH	Host-parasite Relations among Group A Streptococci	137,083	5 years

RESEARCH SPACE

Research Space - 22,400 sq. ft. on the 9th and 10th floors of the University Hospital where each investigator has appropriate and well-equipped research space. This includes 4 laboratories for graduate student use and two instrument rooms containing among other equipment--3 scintillation counters, a Model E analytical ultracentrifuge and Nikon optical comparator, an accelerated system amino acid analyzer and computer, gas chromatograph, preparative ultracentrifuge, gas flow Gm counter, high voltage electrophoresis, ratio recording spectrophotometer, Tiselius electrophoresis equipment, a sonicator with high intensity probe.

Teaching and Research Space - 5,300 square feet on the 2nd floor of the University Hospital.

Animal Quarters - 441 sq. ft., 2nd floor of the University hospital.

Germfree and electron microscopy facilities - 1,414 sq. ft. in Diehl Hall, housing a germfree unit and tissue culture lab plus the electron microscope and preparative rooms.

(Total Research Space approximately 14529.)

DEPARTMENT OF NEUROLOGY

The research program of the Department of Neurology is a broad, multidisciplinary program covering all basic and clinical areas in the field of the neurological disorders. One of the chief research interests is in the field of cerebrovascular disease. Not only is their ongoing research in the clinical aspects of this condition, but very extensive investigation in some of the basic mechanisms, such as strokes, is now underway. Other research interests in the Department of Neurology include neurochemistry, neurophysiology, neuropathology, electrophysiology including electroencephalography and electromyography. Various members of the staff are actively engaged in the various aspects of all of these fundamental areas of basic neurology.

Number of Individuals	-	47
ACADEMIC RANK:		
Professors	9	
Associate Professors	10	
Assistant Professors	17	
Research Associates	1	
Instructors	7	
Research Fellows	3	

Research space available in Department of Neurology

Graduate Instruction - Staff Research space in Department of Neurology - 8,719 sq. ft.

Offices	1112 sq. ft.
Laboratories	5392 sq. ft.
Auxiliary	2215 sq. ft.

RESEARCH GRANTS

INVESTIGATOR	TITLE OF PROJECT	SOURCE	AMOUNT
Dr. Abe Baker Professor and Director	Neurological Research Center in Cerebrovascular Disease Ends August 31, 1969 Commitment 4 Add. yrs.	NIH	$403,512.00
	International Collaborative Study of Cerebrovascular Disease Expires May 31, 1969	NIH	$ 7,384.00
Dr. Milton Alter Associate Professor	Research on Genetics of Cerebrovascular Accidents Commitment 2/1/69-1/31/71	NIH	$ 41,018.00
	Dermatoglyphics in Mental Retardation Ends October 31, 1969 Commitment 2 Add. yrs.	NIH	$ 29,654.00
	Epidemiology Study of Multiple Sclerosis	NMSS	$ 21,960.00
Dr. James Berry Professor	Lipid Metabolism in Experimental Demyelination Ends December 31, 1969 Commitment for 1 Add. yr.	NIH	$ 20,604.00
Dr. William Bradley Associate Professor	Neurogenic Bladder Ends 12/31/69 Commitment 1 Add. yr.	NIH	$ 31,082.00
	Implantable Bladder Study	Medtronics Inc.	$ 16,000.00
Dr. Harold Cohen Associate Professor	Catabolism of Glutamate by Cerebral Mitochondria Expires December 31, 1969	NIH	$ 21,915.00
Dr. Sping Lin Assistant Professor	Biochemical Cytochemical Study of Functional Neurons Ends August 31, 1969 Commitment 1 Add. yr.	NIH	$ 31,277.00

Dr. Sping Lin Assistant Professor	Phosphate Metabolism in Developing Brains Expires April 30, 1970	NIH	$ 27,846.00 (requested)
Dr. Hildred Schuell Professor	Research on Evoked Cortical Potentials in Aphasia Ends May 31, 1969 Commitment 2 Add. yrs.	SRS	$ 52,034.00
Dr. Kenneth Swaiman Associate Professor	Electrical and Chemical Change in Bladder Dysfunction Expires May 31, 1969	NIH	$ 15,701.00
	Studies of Protein Synthesis in Developing Nervous Tissue During Electrical Stimulation	Epilepsy Foundation	$ 10,000.00
Dr. Fernando Torres Professor	Electrographic Alterations in Cerebrovascular Disease Expires April 30, 1970	NIH	$10,883.00
	Longitudinal Study of EEG Patterns in Children Expires August 31, 1969	NIH	$ 14,611.00

PENDING RESEARCH PROJECTS
DEPARTMENT OF NEUROLOGY 5/29/69

INVESTIGATOR	TITLE OF PROJECT	SOURCE	AMOUNT
Dr. Kurshed Ansari Assistant Professor	Development of a Specific Immunological Test for Diagnosis of Multiple Sclerosis	MS Society	$9,846
Dr. William Kennedy Associate Professor	Invervation of Muscle Spindles, Normal and Abnormal	U.S.P.H.S.	27,691
Dr. William A. Myers Assistant Professor	The Effects of Observation on Learning in Monkeys	U.S.P.H.S.	4,896
Dr. Joo Ho Sung Associate Professor	Aleutian mink-Chediak-Higashi Disease	American Cancer Society	14,046
Dr. Kenneth Swaiman Associate Professor	Food Deprivation Effect on Protein in Immature Brain	U.S.P.H.S.	29,135
Dr. Fernando Torres Professor	Effects of Genetically Caused Cerebellar Defect on Experimental Epilepsy in Mice	Epilepsy Foundation	8,506

RESEARCH PROGRAM

The board categories of research carried out in the Department of Neurosurgery relate to functions of the canine and human bladder and the development of an automatic stimulating device. Another area is that of brain neoplasm growth and cerebral edema which requires us to have tissue culture and electron microscope facilities. Another broad area is somewhat electrophysiological, having to do with evoked potentials of the spinal cord and the cerebellum. This latter, to some extent, does fit in with the earlier area of functions of the human bladder. Another area of investigation relates to the longitudinal psychometric evaluations of patients with discrete brain lesions which is a study in which we try to assess any significance of various parts of the brain.

Lyle A. French, M.D., M.S., Ph.D.
Professor and Head

Shelley N. Chou, M.D., M.S., Ph.D.
Professor

Manfred Meier, Ph.D.
Professor

William Bradley, M.D.
Associate Professor

Donlin M. Long, M.D., Ph.D.
Assistant Professor

James R. Bloedel, Ph.D.
Assistant Professor

Edward L. Seljeskog, M.D.
Instructor

Jess Mottaz
Research Fellow

CURRENT AND PENDING RESEARCH GRANTS

rincipal Investigator	Title of Project	Source of Funds
Don M. Long, M.D.	Ultrastructure of Evolution of Cerebral Edema	$16,904 (69-70) USPHS
Manfred Meier, Ph.D. Lyle A. French, M.D.	Behavior and EEG Correlates of Neurosurgery Ablations	$26,700 (69-70) USPHS-pending
William Bradley, M.D. Shelley N. Chou, M.D.	Investigations of the Neurogenic Bladder	$31,000 (69-70) USPHS
Don M. Long, M.D.	Special Grant	$3,500 (69-70) American Cancer Society, Minnesota Division, Inc.
Staff	Morris T. Baker Fund for Neurosurgical Research and Training	$10,000/yr./approx. Private
Staff	Lyle A. French Fund for Neurosurgical Research and Training	$10,000/yr./approx Private
Staff	William T. Peyton Fund for Neurosurgical Research and Training	$10,000/yr./approx Private
Lyle A. French, M.D.	Neurosurgery Training Program	$45,197 (69-70) USPHS
Lyle A. French, M.D.	Neurosurgical Training Program in Cerebrovascular Disease	$16,163 (69-70) USPHS

RESEARCH SPACE IN NEUROSURGERY

Neuropsychology	657 sq. ft.
Electron Microscopy	429 sq. ft.
Electrophysiology	709 sq. ft.
Animal Quarters	PRN
Tissue Photography Lab and Office	132 sq. ft.

RESEARCH PROGRAM FOR OBSTETRICS AND GYNECOLOGY

A. The research program of the Department of Obstetrics and Gynecology involves five major areas of investigation. These programs are not only investigational but are also training programs for both undergraduate and graduate departmental instruction.
   1. Reproductive endocrinology and infertility
   2. Reproductive physiology
   3. Placental physiology and pathology
   4. Gynecologic oncology
   5. Psychiatric aspects of Obstetrics and Gynecology

1. Reproductive Endocrinology and Infertility

Staff: Erlio Gurpide, Ph.D., Professor Ob-Gyn, and Biochemistry
John Sciarra, M.D., Ph.D., Professor Ob-Gyn
Richard P. Bendel, M.D., Assistant Professor Ob-Gyn
John Tseng, Ph.D., Research Fellow
Linda Tseng, Ph.D., Research Fellow

Projects: Steroid dynamics and metabolism.
Hormone production by the placenta.
Angiotensin studies in pregnancy.
Evaluation of the infertile couple.

Funding: Departmental
Federal and private grants pending

2. Reproductive Physiology

Staff: Carlos Mendez-Bauer, M.D., Assoc. Prof. Ob-Gyn and Physiology
Juan J. Poseiro, M.D., Assoc. Professor Ob-Gyn
Luis Escarcena, Research Fellow

Projects: Measurement of fetal and maternal parameters associated with normal and abnormal labor.

Funding: Departmental
Federal and private grants in preparation

3. Placental Physiology and Pathology

Staff: John Sciarra, M.D., Ph.D., Prof. Ob-Gyn
Jan Jerasek, M.D., Assistant Prof. Ob-Gyn

Projects: Protein hormones of the placenta.
Developmental pathology and genetics.

Funding: Departmental
Federal and private grants in preparation

4. Gynecologic Oncology

Staff: Konald A. Prem, M.D., Prof. Ob-Gyn

Projects: Evaluation of therapy of gynecologic malignancies

Funding: Departmental
(future funding for this area assured from the Minnesota Medical Foundation)

5. Psychiatric Aspects of Obstetrics and Gynecology

Staff: Irving Bernstein, M.D., Clin. Prof. Ob-Gyn and Psychiatry

Projects: Psychiatry in Residency Education in Ob-Gyn

Funding: Departmental

B. Pending Research Grants:

1. Principle investigator: Erlio Gurpide, Ph.D., Prof. Biochem. and Ob-Gyn

Title: Dynamics of Uptake of Estrogens and Androgens by Human Endometrium

Soure of Funds Population Council

2. Principle investigator: Erlio Gurpide, Ph.D., Prof. Biochem. and Ob-Gyn

Title: Dynamics of Interaction of Progesterone and 20 Hydroxy-4-Pregnene-3-one with Human Endometrium.

Source of Funds: Center for Population Studies, National Institute of Child Health and Human Development

C. Research Space

Diehl Hall, 2000 sq. ft. (approx.)
Mayo Bldg. 1000 sq. ft. (approx.)
Mayo Bldg. (Hosp.) 500 sq. ft. (approx.)

The programs outlined in Section A have been predicated and planned on the assumption that several thousand additional sq. feet of laboratory space will be available to allow for anticipated expansion in all designated areas. Since there are all new programs for the Department of Obstetrics and Gynecology, space is presently overtaxed and it would be impossible for any of these research and training programs to fully develop without the acquisition of new facilities.

DEPARTMENT OF OPHTHAMOLOGY

I. Basic Research

A. Lens

1. Study of the factors which control the cation and water content of the lens. This is ultimately aimed at a better understanding of cataract formation. Fluxes of cations are measured using appropriate isotopes. Studies of the labeled amino acid uptake are also included. Lenses are almost exclusively from experimental animals and our studies range from that of the normal to those lenses made cataractous by various means.

2. Isolation and characterization of enzymes of the lens, in particular, LDH and the enzymes involved in the synthesis of gluthathione. Glutathione is found in higher concentration in the lens than in any other tissue. It is one of the first substances to disappear in cataract formation.

3. Identification and characterization of antigens common to the lens and skin. These studies have clinical significance in that certain skin disorders are associated with cataracts.

4. Other studies which are germane to the three main ones listed above are also carried out as needed. These include changes in total proteins, free amino acids, lipid composition, etc. in various experimental situations involving the normal and cataractous lens.

B. Cornea

1. Study of the factors which control the hydration of the cornea. These studies are done generally on experimental animal corneas although a fair number of human corneas are also used. A variety of parameters are measured. The clinical significance of these studies lies in the fact that most corneal insults cause hydration and decrease in clarity.

2. Study of the factors which influence the homograft reaction in a corneal transplant. Our concern here has been with the particular structures of the cornea involved in the induction of the homograft reaction.

3. Identification and characterization of antigens common to the skin and the cornea. This is part of the same study which is being carried out in the lens and motivated by the same reasons, namely, certain skin diseases are associated with corneal disease.

4. Studies of other factors which might influence the fate of a corneal transplant. These include such practical things as the ability to determine the viability of donor material, the preservation of donor material, technical aspects of corneal transplants and the like.

C. Study of the factors that produce retinal detachment in monkeys and the pathogenesis of same.

D. Study of the turnover of aqueous humor using various isotopes. These studies include the formation and the routes of drainage under various conditions.

E. Study of the penetration via various routes and distribution within various ocular structures of drugs of ophthalmic interest. Radioisotopically labeled drugs are employed.

F. Special pathologic studies of various human ocular diseases.

II. Clinical Research

A. Studies of the etiology and modes of treatment of retinal detachment on a broad front. This includes genetic aspects of retinal detachment, association with other diseases, detachments in children, operative techniques, factors leading to delayed infection and the like.

B. Studies of the natural history and the effect of photocoagulation on diabetic retinopathy.

C. Studies of various retinal diseases employing fluorescein angiography.

D. Studies of various corneal diseases over a rather wide front, particularly the rather intractable corneal diseases not amenable to usual therapeutic techniques and the use of keratoplasty in these diseases. Also included are studies of congenital corneal diseases, studies on corneal transplantation in the human and the like.

E. Studies of the ocular diseases of children particularly those due to a prenatal influence.

F. Studies of problems of the extraocular muscles.

The professional personnel carrying on these studies include one individual with both Ph.D. and M.D. degrees, who is a professor, two Ph.D.'s in Biochemistry, one an associate professor and the other an assistant professor and two M.D.'s, one an associate professor and the other an assistant professor. In addition there is one key individual who has a M.S. degree in Biochemistry who holds a civil service rank of Scientist. All are full time in the Department of Ophthalmology. Ten non-professional personnel with various civil service ratings assist in the research program. Residents and Special Fellows are also engaged in research, both basic and clinical.

The major source of funding is from the NIH. Currently this totals $154,708.00. The bulk of this, $142,464, is derived from the two major research grants listed below. The remainder is that fraction of the research training grant (not including stipends) which can be legitimately identified as supporting the above listed research. Current private support totals approximately $40,000. This comes from a variety of sources and is generally uncommited support. Representative of these sources are Research to Prevent Blindness, Inc., and the Minnesota Lions.

Current Support:

Principal Investigator: John E. Harris, Professor and Head
Title: Movement of Water and Solutes across Ocular Barriers
Source of Fund: NIH

Principal Investigator: William B. Rathbun, Assistant Professor
Title: Antigentic Relationships between Lens and Skin
Source of Funds: NIH

Awarded but not funded as yet:

Principal Investigator: William B. Rathbun, Assistant Professor
Title: Career Development Award
Source of Funds: NIH

Existing Space			sq. ft.
Diehl 228	Sterile pack, washroom, and storage		156
Diehl 230	General purpose room		243
Diehl 250	Research lab, eye bank		291
Diehl 251	Research lab		434
Diehl 254	Instrument room		132
Diehl 255	Research lab		585
Diehl 256	Lab darkroom		70
VFW 162A	Research lab		230
VFW 173A	Cold room		100
		Total	2,241

The research program to be carried on in the proposed facilities will include an expanded version of that already underway. Our basic programs which lie in the area of the biochemistry and physiology of the normal and pathologically altered ocular structures will continue. Increased space will permit the department to move forward on all projects at once instead of individually as is now the case. New projects will include studies of the electrical response of the retina and the extraocular muscles using the electroretinogram, electro oculogram, evoked occipital potentials and elctromyograms. Electron microscopy studies studies of the pathologically altered ocular structures will also be mounted.

ORTHOPEDIC SURGERY

GRANTS:

Dr. Wilton Bunch	"Medical and Educational Research--Gillette State Hospital" No equipment, no salary money--supplies only--minimal.
Dr. Wilton Bunch	Graduate School--$2000--supplies and equipment
Dr. William Kane	Graduate School--$1750--"Blood Flow"--supplies and equipment

LAB SPACE:

Mayo B190	127 square feet
Diehl F123	243 square feet

UNIVERSITY OF *Minnesota*

DEPARTMENT OF OTOLARYNGOLOGY
A-605 MAYO MEMORIAL BUILDING • MINNEAPOLIS, MINNESOTA 55455

June 26, 1969

TO: Robert O. Mulhausen, M.D., Assistant Dean
FROM: Michael M. Paparella, M.D., Professor and Head, Department of Otolaryngology
SUBJECT: AIMS AND OBJECTIVES OF RESEARCH IN THE DEPARTMENT OF OTOLARYNGOLOGY

The objectives in research in the Department of Otolaryngology are to push forward our frontiers of knowledge as regards all of the communicative disorders. The communicative disorders especially involve deafness and speech problems. The research program in Otolaryngology is devoted to clinical otolaryngology as well as the communicative disorders and as such is involved with problems of head-neck oncology, etc. The main thrust of the research effort in this department is in the direction of deafness research and to this end, currently approximately 2,500 square feet are devoted to research. Each resident participates in research and full-time and part-time faculty participate in research as well. The future objectives are to expand current activities and to add additional faculty and additionally needed research laboratories. The following laboratories are currently established in the Department of Otolaryngology: 1) Temporal Bone Pathology and Light Microscopy, 2) Electron Microscopy, 3) Psychoacoustics, 4) Audiology Research, 5) Biochemistry of the Ear, Nose and Throat, 6) Vestibular Research and Electrophysiology, 7) Animal Clinical Operating and Storage Facilities. It is felt that research training built into the graduate training program enhances the clinicians ability to keep current in his field as well as to provide service. At the same time there is a dire need for teacher-investigators in the profession of otolaryngology. The residency training program in otolaryngology has gone from a four to a five year program, mainly to allow each resident to participate more meaningfully in research oriented projects. This will, we hope, provide a partial answer to the serious manpower shortage as regards quality teacher-investigators in the field of otolaryngology.

SPACE AVAILABLE

Presently the Department has 2,500 square feet of research oriented space at the University Hospitals (about 4,000-5,000 for the entire program including the affiliated Hospitals).

HEALTH SCIENCES CENTER
MEDICAL SCHOOL

Michael M. Paparella, M.D.
Professor and Head
Department of Otolaryngology

RESEARCH PROGRAMS BEING CARRIED OUT IN THE DEPARTMENT OF OTOLARYNGOLOGY

Investigator	Title	Amount	Source
Michael M. Paparella, M.D.	Experimentally Induced Serous Otitis Media	$52,253	United States Public Health Service (National Institutes of Health)
Michael M. Paparella, M.D.	Otolaryngology Training Grant	111,670	United States Public Health Service (National Institutes of Health)
Michael M. Paparella, M.D.	Biochemistry of Otosclerosis	5,000	American Otological Society
Michael M. Paparella, M.D.	Familial Progressive Sensori-Neural Deafness	10,800	Deafness Research Foundation
Arndt J. Duvall, III, M.D.	Fluid Barriers within the Cochlea	28,000	United States Public Health Service (National Institutes of Health)
W. Dixon Ward, Ph.D.	The Determination of Susceptibility to Hearing Loss	25,565	United States Public Health Service (National Institutes of Health)
Cedric A. Quick, M.D.	The Use of a New CO_2 Laser in the Investigation of the Physiology of the Cochlear Duct	2,500	University of Minnesota Grants in Aid of Research
W. Dixon Ward, Ph.D.	Career Development Award	29,868	United States Public Health Service (National Institutes of Health)

DEPARTMENT OF PATHOLOGY

RESEARCH PROGRAM

The objectives of the Medical School of the University of Minnesota for research in health and the health related sciences are:

A) To attract and maintain a group of capable scientists and to provide them with suitable facilities for basic and applied research.

B) To attract and to train able young men for research in health and health related sciences.

The Medical School has been able to attract and keep a large group of able and productive scientists with extremely diverse fields of interest. These men have been provided the opportunity to follow their own wishes in choosing the area of their research.

In the Department of Pathology, the objectives are essentially the same. Every effort is made to allow complete freedome of choice for each staff member. Even the young men in training are encouraged to develop their own research programs and to pursue them. Almost all of our staff are fundamentally morphologists, but they have extended the usefulness of conventional morphology by using new techniques many of which also provide valuable information about the functions of cell and tissues. Although major emphasis has been on morphology as a research technique, we do not consider it necessary or desirable that all research projects utilize this technique.

Research Programs in the Department are:

A. Enchancement of Pulmonary Defense Mechanisms Against Carcinogens.

B. Chemoprophylaxis of Chemical Carcinogenesis.

C. Histochemical Studies of Carcinoma of the Large Bowel.

D. Studies of the Carcinogenic Effects of Surfactants in the Gastrointestinal Tract.

E. The development and application of radioisotope techniques, in particular radioautography and liquid scintillation beta spectrometry, to problems of experimental pathology.

F. Periodic variations in the toxic and therapeutic ratio of several chemical and physical agents now used in cancer therapy.

G. Histochemistry of Nervous System Proliferation.

H. 1. Analysis of circadian system physiology and of its potential applications.

2. Methods for the concomitant evaluation in one, or several, physiologic time series, of rhythmic components with widely differing periods.

H. 3. Quantitative definition of less regular, but quite common, physiologic changes of non-circadian frequencies, in terms of the underlying factors.

4. The possibility that experimental pathology and clinical disease can result from two types of temporal disorders: Circadian desynchronization, internal or external, and broader spectral shifts.

I. Temporal parameters within the cell, with special reference to cancer.

J. Biochemical aspects of central nervous system functions.

K. Development of tables and displays of circadian rhythms and rhythms with other frequencies in a number of body funtions as gauges of a rhythm alteration in disease.

Dr. Kenneth Osterberg - Associate Professor

Current accounts:

Electron Microscopy Studies of Glial Induction - USPHS ($5000)

Ultrastructural aspects of the glial reaction - Graduate School, Univ. of Minnesota ($2400)

Dr. Richard D. Estensen, Assistant Professor

Effective July 1, 1969

Investigation of Control of Life Spanning Phenomenon of Human Diploid Cells in Culture - ACS Institutional Research Grant ($3000) also Graduate School, University of Minnesota ($3200).

Pending Account:

Nuclear-cytoplasmic transplantation - Department of the Army ($23,974)

Research Space:

14.468 square feet

Dr. Lee W. Wattenberg, Professor

Current Accounts:

Histochemical Study of Cancer of the Large Bowel - USPHS ($31,496)

Research on Noxious Chemical Effects on Pulmonary Tissues - AMA ($49,654)

Cancer Research Training Grant - USPHS ($49,163)

Pending Accounts:

Continuation of Histochemical Study of Cancer of the Large Bowel ($33,560)

Continuation of Research on Noxious Chemical Effects on Pulmonary Tissues ($51,183)

Continuation of Cancer Research Training Grant ($44,621)

Research on In Utero Effect of Environmental Carcinogens - USPHS ($50,499)

Dr. Franz Halberg, Professor of Experimental Pathology
Current Accounts:

Circadian rhythms as a gauge of extraterrestrial performance - NASA ($230,000)

Computer techniques for rhythmometry - NASA ($75,000)

Human circadian rhythms and aviation medicine - USAF ($29,244)

Pending accounts:

Circadian rodent rhythms as a gauge of extraterrestrial performance - NASA ($250,000)

Computer techniques for rhythmometry - NASA ($75,000)

Human circadian rhythms and aviation medicine - USAF

THE DEPARTMENT OF PEDIATRICS

John A. Anderson, Professor and Head

The Department of Pediatrics has developed historically from primarily clinical investigation to a healthy mixture of clinical and basic science investigations. For purposes of discussion the research interests of the Department can be arbitrarily divided into seven groups:

I. The Biochemical Group include studies of the metabolism of amino acids related to birth defects, direct and indirect calorimetry in newborns, maturation of adrenocortical function in the newborn, problems of diabetes, hypoglycemia and growth, the effects of growth hormone on collagen and protein synthesis, neonatal pharmacology, embryogenesis of the adrenergic nervous system, neutrophil metabolism during bacterial phagocytosis and studies of pulmonary disease in infants and children.

II. The Renal Group has a long standing interest in the pathogenesis of glomerulonephritis, the nature of cellular and renal extracellular membranes and the immunopathology of renal disease.

III. The Infectious Disease Group is studying the biology of pathogenic staphylococci, the biology and epidemiology of Group A streptococci, the pathogenesis of rheumatic fever and studies of factors involved in phagocytosis.

IV. The Hematology-Ontology Group conducts a large diagnostic, treatment and research program in the cancer of childhood, chemotherapy of leukemia; basic investigations in the areas of platelet ultrastructure and function, the metabolism of phospholipid and cholesterol in cell membranes and coagulation studies in patients with cardiac disease.

V. The Immunology Group has a long and famous history of the study of the development of the immune systems, the pathogenesis of auto immune disorders, the study of renal disease in children, the phylogenetic development of plasma proteins, the developmental bases for birth defects of the immunological apparatus and body defenses, the relationship of immunogenesis and leukemogenesis; and in the area of transplantation, studies immunologic responses, tolerance, and transplant antigens.

VI. The Cardiology Group is involved primarily in diagnosis of congenital heart diseases, pre and post operative management of cardiac surgical patients and the long term follow-up of the cardiodynamics following cardiac surgery.

VII. The Ambulatory Pediatrics Group has an active program of research in community pediatrics which includes the delivery of pediatric comprehensive care to disadvantaged neighborhoods in two locations; the Community-University Health Care Clinic and the Pilot City Project. The University Hospitals Out-patient Department Group works in conjunction with the faculty and staff in directing birth defects and special clinics related to specific disease problems.

Areas in which research programs are being developed that will represent expansion of research and teaching in the Department of Pediatrics include virology, neonatology and gastroenterology. These programs cannot be developed and those programs presently in existence cannot be adequately housed without expanded facilities. It is proposed that the new pediatric research laboratories in Building A and B will house the following groups: Biochemical Group, Renal Group, Virology, Neonatology and Gastroenterology. Without this facility faculty expansion for educational needs of larger medical school classes will not be possible. It is anticipated that the location of pediatric laboratories and offices on the same level as patient-care facilities will create an environment which affords ample communication of medical students with faculty, post-doctoral fellows and associated medical personnel. This should provide an ideal situation for development of programs in which students participate in bedside care and laboratory investigation of clinical problems relative to the pathogenesis, diagnosis and treatment of human disease. In addition the availability of an extensive research program in the Department of Pediatrics will provide a consultative service for the region at a unique highly sophisticated level and create an atmosphere in which quality of medical care is stimulated and developed.

NUMBER OF INDIVIDUALS IN THE DEPARTMENT OF PEDIATRICS

ACADEMIC RANK

Professor and Head	1
Professors	9
Associate Professors	15
Assistant Professors	27
Research Associates	2
Lecturers	5
Instructors	3
Research Fellows	4
Research Specialists	15
Research Assistants	1
Medical Fellows (Research)	29
Medical Fellows (Resident)	28
Interns	13
	152

TYPE OF ACCOUNT	TITLE	INVESTIGATOR	FEDERAL FUNDS	AMOUNT
U.S. Army Contract	"Biology of Pathogenic Staphylococci"	Wannamaker Professor	Yes	$ 42,918.00
U.S. Army Contract	"Relationship of Biological and Epidemiological Characteristics of Group A Streptococci"	Wannamaker Professor	Yes	44,828.00
U.S. Army Contract	"Surveillance of Streptococci M Type among Military Personnel"	Chapman Assoc Professor	Yes	22,909.00
USPHS-Research Grant	"Study of Renal Disease in Childhood"	Good Professor	Yes	59,449.00
USPHS	"Extracellular Products of Group A Streptococci"	Wannamaker Professor	Yes	51,815.00
USPHS	"Non-specific Resistance to Infection and Intoxication"	Good Professor	Yes	55,100.00
USPHS	"Fundamental Studies of the Immunologic Processes"	Good Professor	Yes	68,987.00
USPHS	"Pathogenesis of CNS Autoimmune Disorders"	Good Professor	Yes	59,473.00
USPHS-Research Grant	"Adrenal Steroid Metabolism in Children"	Reynolds Assoc Professor	Yes	21,090.00
USPHS-Career Development Award	"Studies on Inflammation"	Page Assoc Professor	Yes	29,743.00
USPHS	"Electron Microscopic Studies Immune Response"	Clawson Asst Professor	Yes	24,442.00
USPHS-Research Grant	"Direct and Indirect Calorimetry in Newborns"	Anderson Professor and Head	Yes	23,946.00

TYPE OF ACCOUNT	TITLE	INVESTIGATOR	FEDERAL FUNDS	AMOUNT
USPHS-Research Grant	"Children's Cancer Study Group A"	Krivit Professor	Yes	$ 55,386.00
USPHS	"Maturation of Adrenocortical Function in Newborn"	Reynolds Assoc Professor	Yes	29,152.00
USPHS-Continuation	"Prospective Study of Skin Infections and Nephritis"	Wannamaker Professor	Yes	39,827.00
USPHS-Career Award	"Mechanisms of Bacterial Infections in Burns"	Anthony Asst Professor	Yes	24,422.00
USPHS-Research Grant	"G-Variants, Host Reactions and Chronic Infections"	Quie Professor	Yes	31,862.00
USPHS-Career Development Award	"Chemical and Structural Relations of Gamma-globulins in Immunobiology"	Hong Assoc Professor	Yes	29,922.00
USPHS-Research Grant	"Correlation of Structure and Function of Immunoglobulins"	Hong Assoc Professor	Yes	23,311.00
USPHS-Fellowship Supply Allowance-Meuwissen		Good Professor	Yes	1,000.00
USPHS-Research Grant	"Embryogenesis of the Adrenergic Nervous System"	Mirkin Assoc Professor	Yes	22,190.00
USPHS-Fellowship Supply Allowance-Clawson	"Ultrastructure of Immunologically Competent Cells"	Good Professor	Yes	1,000.00
USPHS-Fellowship Supply Allowance-Cain	"Cellular Dynacies of Immunological Maturation"	Good Professor	Yes	1,000.00
USPHS-Fellowship Supply Allowance-Azar		Good Professor	Yes	1,000.00

TYPE OF ACCOUNT	TITLE	INVESTIGATOR	FEDERAL FUNDS	AMOUNT
USPHS-Career Development Award	"Hormone Control of Protein Metabolism and Development"	Brown Asst Professor	Yes	$ 20,182.00
USPHS-Research Grant	"Nature of Cellular and Renal Extracellular Membranes"	Michael Professor	Yes	45,501.00
USPHS-Post Doctoral Research Fellowship		Gajl-Peczalska Res Spec	Yes	10,344.00
USPHS-Research Grant	"Phylogenetic Development of Plasma Proteins"	Pollara Res Assoc	Yes	31,240.00
USPHS-Fellowship Supply Allowance		Good Professor	Yes	10,800.00
USPHS-Research Grant	"Pathogenesis of Rheumatic Fever"	Ayoub Professor	Yes	54,300.00
USPHS-Post Doctoral Fellowship		Linna Res Spec	Yes	10,369.00
USPHS-Research Grant	"Studies of Opsonins in Phagocytosis"	Quie Professor	Yes	28,525.00
USPHS-Fellowship Supply Allowance-Coifman		Good Professor	Yes	1,000.00
USPHS-Fellowship Supply Allowance-Tarmina		Good Professor	Yes	1,000.00
USPHS-Research Grant	"Total Body Irradiation and Transplantation"	White Assoc Professor	Yes	28,438.00
USPHS-Research Grant	"Pathogenesis of Glomerulonephritis"	Vernier	Yes	35,915.00

TYPE OF ACCOUNT	TITLE	INVESTIGATOR	FEDERAL FUNDS	AMOUNT
USPHS-Research Grant	"Neutrophil Metabolism during Bacterial Phagocytosis"	Page Assoc Professor	Yes	$ 19,990.00
USPHS	"Research on Respiratory Pathogens"	Dajani Asst Professor	Yes	18,000.00
USPHS	"The Chemical Basis for Diabetic Vascular Disease"	Brown Asst Professor	Yes	31,404.00
USPHS-Career Development Award		Meuwissen Instructor	Yes	18,000.00
USPHS	"Collaborative Study on Cerebral Palsey"	Anderson-Fisch Prof and Asst Prof	Yes	376,904.00
National Science Fdn.	"Molecular Events in Cell Differentiation"	Gray Assoc Professor	No	4,354.00
Wyeth Laboratory-Research Pediatrics		Ulstrom Assoc Dean	No	
Hoffman-LaRache, Inc.	"Evaluation of the Vitamin A Tolerance Test Using Standard Vitamin A Materials"	Warwick Assoc Professor	No	
Hoffman-LaRoche, Inc.	"Research on Strains of Klebsiella-Enterobacterserratia"	Matsen	No	
Lilly Research Lab	"Evaluation of Keflordin and Cephaloglycin"	Matsen	No	12,789.00
Lilly Research Lab	"Evaluation of Ilosome in the Treatment of Mycoplasma Pneumoniae Infections"	Dajani Asst Professor	No	

TYPE OF ACCOUNT	TITLE	INVESTIGATOR	FEDERAL FUNDS	AMOUNT
Burroughs Wellcome & Co.-International Conference	(For Travel)	Good, Pollara Prof and Res Assoc	No	$ 1,300.00
Massengill Co.-Hemostasis Research Fund		White Assoc Professor	No	10,000.00
Bristol Laboratories-In Vitro Study PL 5875		Levitan Med Fellow	No	6,000.00
		Chilgren Asst Professor		4,000.00
The National Foundation	"To Study Developmental Bases for Birth Defects of the Immunological Apparatus and Bodily Defenses"	Good Professor	No	107,423.00
Minn. Heart Association	"Studies on the Protein Binding of Catecholanienes"	Mirkin Assoc Professor	No	3,000.00
Minn. Heart Association	"Investigation of certain aspects of Lymphocyte Function in Immunological Deficiency Disease"	Meuwissen Instructor	No	5,090.00
American Heart Association	"Heart Research Career Investigatorship"	Wannamaker Professor	No	11,000.00
Minnesota Medical Fdn.	"Intern Research in Pediatrics"	Hong Assoc Professor	No	1,500.00
American Cancer Society	"The Relationship of Immunogenesis and Leukemogenesis"	Good Professor	No	893,895.00
Minnesota Medical Fdn.	"Investigation of Lymphocytes"	E. Gray Assoc Professor	No	2,500.00

TYPE OF ACCOUNT	TITLE	INVESTIGATOR	FEDERAL FUNDS	AMOUNT
National Cystic Fibrosis	"Statistical Evaluation of Mortality in Patients with CF"	Warwick Assoc Professor	No	$
Minnesota Division-American Cancer Society	"Enzyme Patterns in Subcellular Organelles"	Pollara Res Assoc	No	
American Heart Association	"Immunological Responses, Tolerance, and Transplant Antigens"	Good Professor	No	19,800.00
Minnesota Medical Fdn.	"Studies Clinically Related to Patients with Hodgkin's Disease"	Gatti Med Fellow	No	1,970.00
Arthritis Fdn.	"Connective Tissue Diseases"	Good Professor	No	10,800.00
Minnesota Heart Association	"Cellular Immune Competence of Intestinal Lymphoid Tissues in the Rabbit"	Dupuy Res Spec	No	1,102.00
Life Insurance Medical Research Fund	"Research on the Structural Physiology of Megakaryocytes"	White Assoc Professor	No	33,000.00
Minnesota Medical Fdn.	"Metabolism of Phospholipid and Cholesterol in Cell Membranes"	Wedemeyer Res Spec	No	1,400.00
Minnesota Heart Association	"An Analysis of Graft Rejection: Metabolic Inhibition of the Graft-versus-Host Reaction"	Foker Med Fellow	No	4,245.00
Minnesota Heart Association	"Reticuloendo-thelial Function in the Isolated Perfused Liver"	Jeunet Med Fellow	No	3,820.00
Minnesota Heart Association	"Alteration in Mammalian and Non-mammalian Thrombocytes during Clot Formation	White Assoc Professor	No	4,000.00

TYPE OF ACCOUNT	TITLE	INVESTIGATOR	FEDERAL FUNDS	AMOUNT
Minnesota Medical Fdn.	"Research on Immunological Deficiency"	Coifman Med Fellow	No	$ 1,400.00
National Cystic Fibrosis	"Care, Research and Training Center"	Warwick Assoc Professor	No	41,500.00
AHA-Supply Grant		Wannamaker Professor	No	500.00
American Cancer Society-Minnesota Division	"Avian Lymphoid Leukosis: Development of Premalignant and Early Malignant Changes of the Central Lymphoid Organs"	Clawson Asst Professor	No	4,800.00
American Heart Association	"Immunologic Alterations in Experimental Amyloidosis"	Rodey Med Fellow	No	3,652.00
American Heart Association	"Experimental Polycystic Renal Disease"	Perey Med Fellow	No	39,600.00
Mrs. Ramsey	"Research on Cellular Immunity"	Chilgren Asst Professor	No	2,000.00
Nat'l. Tuberculosis Assoc. (American Thoracic Society)	"Thymus and Bursa Systems of Mammals"	Perey Med Fellow	No	20,829.00
Helen Hay Whitney Foundation-Established Investigatorship		Ayoub Professor	No	14,125.00
Northlands Regional Medical Program	"Proposal for Pilot Study in Post-graduate Education in Pediatric Cardiology"	Lucas Professor	No	7,050.00
American Cancer Society	Faculty Research Assoc. Grant	Clawson Asst Professor	No	19,746.36

TYPE OF ACCOUNT	TITLE	INVESTIGATOR	FEDERAL FUNDS	AMOUNT
Arthritis Foundation	"Biological Activity of Fibrinopeptides"	Pollara Res Assoc	No	$ 1,000.00
The Milheim Foundation for Cancer Research	"Sequential Patterns of Cellular Metabolism on Leukemic Cells as Studied by Radioautography"	Nesbit Asst Professor	No	10,301.70
The Milheim Foundation for Cancer Research	"Tissue Culture of Normal and Leukemic Lymphocytes"	Humphrey Med Fellow	No	7,476.15
American Heart Association Departmental Grant			No	13,000.00
American Cancer Society-Minnesota Division	"Antigenic Alteration in Leukemia"	Mariani Med Fellow	No	7,000.00
American Cancer Society-Minnesota Division	"Antigen Localization"	Rodey Med Fellow	No	5,375.00
American Cancer Society-Minnesota Division	"Platelet Structure and Function in Patients with Acute Leukemia"	White Assoc Professor	No	6,900.00
American Heart Association	"Pathogenesis of Rheumatic Fever"	Ayoub Professor	No	5,500.00
Minnesota Heart Association	"Sickle Cell Disease: The Mechanism of Erythrocyte Sickling and Hemolysis"	White Assoc Professor	No	8,485.00
National Kidney Fdn.-Upper Midwest Chapter		Brown Asst Professor	No	250.00
Minnesota Heart Association	"Studies on Termination of Tolerance"	Azar Med Fellow	No	3,820.00

TYPE OF ACCOUNT	TITLE	INVESTIGATOR	FEDERAL FUNDS	AMOUNT
Minnesota Heart Association	"An Investigation of Anergy to SK-Ds Associated with Acute Nephritis"	Deinard Med Fellow	No	$ 2,970.00
Minnesota Heart Association	"Serum Opsonins to Bacteria in Heart Surgery Patients"	Dossett Med Fellow	No	2,545.00
Minnesota Heart Association		Frommel Med Fellow	No	3,820.00
Minnesota Heart Association	"Development of Lymphoid Tissues of Human Fetuses"	Kalpaktsoglou Res Spec	No	500.00
Minnesota Heart Association	"Abnormalities of Blood Coagulation in Congenital Heart Disease"	Wedemeyer Med Fellow	No	1,000.00
Arthritis Foundation	"Molecular Basis of Immuno Tolerance"	Azar Med Fellow	No	1,530.00
Arthritis Foundation	"Phylogenetic Studies of the Complement System"	Day Res Spec	No	1,350.00
American Heart Association	"Research on Glomerulo-Nephritis"	Fish Asst Professor	No	41,250.00
Arthritis Foundation	"White Cell Kinetics in Mesenchymal Disease States"	Deinard Med Fellow	No	1,260.00
Arthritis Foundation	"Research on Antigenic Determinants"	Dupuy Res Spec	No	1,350.00
Arthritis Foundation	"Variations of Immunoglobulin Light"	Frommel Med Fellow	No	2,250.00

TYPE OF ACCOUNT	TITLE	INVESTIGATOR	FEDERAL FUNDS	AMOUNT
Arthritis Foundation	"Reticuloendothelial Fundtion"	Jeunet Med Fellow	No	$ 1,800.00
Arthritis Foundation-Minn. Chapter-Research Grant	"Study of RNA-DNA Homology during Immune Response"	Page Assoc Professor	No	1,980.00
Arthritis Foundation	"Immunoglobulins in Red Flora Patients"	Levitan Med Fellow	No	1,620.00
Arthritis Foundation	"Ontogeny of Humoral Immunity"	Perey Med Fellow	No	1,800.00
Arthritis Foundation	"Isolation and Characterization of Antigen-antibody Complexes"	ten Bensel Asst Professor	No	4,813.00
Minnesota Medical Fdn.	"Support of Electron Microscope"	White Assoc Professor	No	5,000.00
Minnesota Medical Fdn.	"Ontogeny of the Immune Response"	Dent Asst Professor	No	1,400.00
Minnesota Division-American Cancer Society	"Metabolic Studies of Leukemic Lymphocytes"	Humphrey Med Fellow	No	
American Cancer Society	"White Cell Kinetics in Malignant Disease"	Deinard Med Fellow	No	5,000.00
Minnesota Medical Fdn.	"Tissue Culture Lab"	Vernier Professor	No	9,350.00
Arthritis Foundation	"Aggregated IgG and a Study of an Antiglobulin in Serum of Bursectomized-Irradiated Agamma-globulinemic Chickens"	Pickering Res Fellow	No	1,800.00

TYPE OF ACCOUNT	TITLE	INVESTIGATOR	FEDERAL FUNDS	AMOUNT
Minnesota Heart Association	"Anti-Inflammatory Agents as Inhibitors of the Complement"	Pickering Res Fellow	No	$ 3,820.00
Minnesota Heart Association	"Experimental Polycystic Renal Disease"	Perey Med Fellow	No	
American Legion Memorial Heart Research		Anderson Professor and Head	No	
Silas McClure Medical Research Fund		Anderson Professor and Head	No	
Dwan Family Fund		Anderson Professor and Head	No	
Robert A. Good Pediatric Research Fund		Anderson Professor and Head	No	
Special Research-Pediatrics, Baker Plan		Anderson Professor and Head	No	
Minnesota Chapter-Order of Eastern Star		Anderson Professor and Head	No	
Squibb Research Inst.	"Study of Amhotericin B Oral Tablets"	Chilgren Asst Professor	No	1,500.00
The Hemostasis Research Fund		White Assoc Professor	No	10,000.00
Twin Cities Diabetes Assoc.	"A Study of the Ketone-Insulin Feedback Mechanism in Hypoglycemia and Diabetes"	Sauls Asst Professor	No	1,620.00

TYPE OF ACCOUNT	TITLE	INVESTIGATOR	FEDERAL FUNDS	AMOUNT
Medical Research Council-Research Training		LaPointe Med Fellow	No	$ 500.00
Human Growth, Inc.-Research	"The Effects of Human Growth Hormone on the Protein & Collagen Synthesis of Fibroblasts Derived from Patients with Growth Failure"	Brown Asst Professor	No	6,056.50
Helen E. Drew-Pediatric Research Fund	"Pathogenesis of Glomerulonephitis"	Vernier Professor	No	10,000.00
Helen Hay Whitney Foundation		Anderson Professor and Head	No	
St. Paul Children's Hospital		Anderson Professor and Head	No	
Eliza Kenny Foundation		Anderson Professor and Head	No	
Markle Foundation		Quie Professor	No	
North Western Hospital		Anderson Professor and Head	No	
Alpha Phi Cardiac Aid Fund		Anderson Professor and Head	No	
General Hospital-Hennepin County Fellowship Fund		Anderson Professor and Head	No	
St. Paul Hospital-Ramsey Fellowship Fund		Anderson Professor and Head	No	

TYPE OF ACCOUNT	TITLE	INVESTIGATOR	FEDERAL FUNDS	AMOUNT
Irvine McQuarrie Memorial Fund		Anderson Professor and Head	No	$
USPHS-Training Grant	"Allergy and Immunology"	Good Professor	Yes	
USPHS-Training Grant	"Pediatrics"	Wannamaker Professor	Yes	47,077.00
USPHS-Department of Surgery	"Surgical Cardiology"	Lucas Professor	Yes	
USPHS-Training Grant	"Cancer Control Senior Clinical Traineeship"	Krivit Professor	Yes	35,100.00
USPHS-Training Grant & Supplement	"Cystic Fibrosis and Other Pulmonary Diseases of Childhood"	Warwick Assoc Professor	Yes	39,290.00
Children's Bureau	"Pediatric and Community Health Training"	Branthaver Asst Professor	No	35,295.00
Children's Bureau	"A Model Comprehensive Medical Dental Care Program for Children"	Defoe Assoc Professor	No	
Hill Family Fdn.-Com-Univ Health Center		Defoe Assoc Professor	No	90,000.00
The National Foundation	"National Foundation Birth Defects Evaluation Center"	Anderson and Fisch Prof & Head and Asst	No	32,703.00
Kosmos		Krivit Professor	No	
McQuarrie		Anderson Professor and Head	No	
Cystic Fibrosis		Warwick and Kaplan Assoc Prof and Inst	No	

DEPARTMENT OF PHARMACOLOGY

A. Number of individuals and academic rank

Chairman and Professor	1
Professors	3
Associate Professors	5
Assistant Professors	8
Instructor	1
	18

B. Departmental grant funding and source

1) Current research grants

No. of Grants	Grantor	Source of Funds	Amount
11	NIH	Federal	672,368
1	NSF	Federal	34,500
		Subtotal - Federal	706,868
1	PMA	Private	20,634
2	SKF	Private	20,000
1	MHA	Private	5,090
4	Misc	Private	18,500
		Subtotal — Private	64,224
1	MMF	State	1,000
2	Grad School	State	3,100
		Subtotal — State	4,100
		Current Total	$775,192

2) Pending research grants

No. of Grants	Grantor	Source of Funds	Amount
5		Federal	188,450
1		State	5,033
3		Private	40,347
		Total	$233,830

C. Principal investigators, research grant titles, and source of funds.

See Attachment I

D. Available research space.

See Attachment II

ATTACHMENT I

Frederick E. Shideman, Chairman and Professor

NIH	Triazines on the Actions of Steroid Hormones
NIH	Neuroeffector Transmitters in the Heart
PMA	Faculty Development Award – Clinical Pharmacology
SKF	Clinical Pharmacology Award
3M	Company Service Fund
SKF	Pharmacology General Service Fund
CMB	China Medical Board – Visiting Professorship

Gilbert J. Mannering, Professor

NIH	Drug Metabolism and Biochemical Pharmacology

Jack W. Miller, Professor

NIH	Epinephrine Content of the Uterus-Effect of Drugs
NIH	PENDING – Pharmacologic Studies Directed to the Development of Contraceptive Drugs

Nelson D. Goldberg, Associate Professor

NIH	Krebs Cycle Control

Bernard L. Mirkin, Associate Professor

NIH	Multidisciplinary Training Program in Clinical Pharmacology
NIH	Drug Metabolism and Biochemical Pharmacology*

Akira E. Takemori, Professor

NIH	Drug Metabolism and Biochemical Pharmacology*

Travis I. Thompson, Associate Professor

NIH	Behavioral Dependence on Non-Narcotic Drugs*
NIH	Drug Self-Administration by Animals
NSF	Operant and Ethological Analyses of Aggressive Behavior
FED	PENDING – Bureau of Narcotic and Dangerous Drugs – A New Technique for Prediciting Drug Abuse Liability

Ben G. Zimmerman, Associate Professor

NIH	Pharmacologic and Reflex Influence on Vascular Tone
STATE	Graduate School Grant

Marion Anders, Associate Professor (will join the staff, July 1969)

NIH	Effect of Pesticides on Conjugative Drug Metabolism
NIH	Stereochemistry of Microsomal Drug Metabolism

Faruk S. Abuzzahab, Assistant Professor

NIH	Drug Metabolism and Biochemical Pharmacology *

James F. Cumming, Assistant Professor

NIH	Drug Metabolism and Biochemical Pharmacology *

Donald B. Hunninghake, Assistant Professor

MHA	Drug Interaction in Man: Implications in Cardiovascular Therapy
SKF	Clinical Pharmacology Award
STATE	Graduate School Grant – Drug Interactions
AHA	PENDING – Clinical Pharmacology of Hypolipidemic Agents
INS	PENDING – Life Insurance Medical Research Fund – Drug Interactions

Harvey J. Kupferberg, Assistant Professor

NIH	Drug Metabolism and Biochemical Pharmacology *

Roy W. Pickens, Assistant Professor

NIH	Behavioral Dependence on Non-Narcotic Drugs
NIH	Drug Self-Administration by Animals *
FED	PENDING – Bureau of Narcotics and Dangerous Drugs – A New Technique for Predicting Drug Abuse Liability *

Norman E. Sladek, Assistant Professor

NIH	Drug Metabolism and Biochemical Pharmacology *
ACS	PENDING – Role of the Endoplasmic Reticulum in Hepatocarcinogenesis

Sheldon B. Sparber, Assistant Professor

MMF	Effects of Drugs Upon Developing Organism	
	Wm. S. Merrill Co.	– Research on Effect of Age on Rats
NIH	PENDING	– Neurochemical Mechanisms in Behavioral Development
NIH	PENDING	– Aggression, Hormones and Sensitivity to Peptic Ulcer

Aloysius J. Quebbemann, Assistant Professor (will join the staff, August 1969)

NIH	PENDING	– The Pharmacology of Renal Tubular Excretory Transport
STATE	PENDING	– Graduate School Grant – The Role of Conjugation in Renal Tubular Transport Mechanisms

Patrick E. Hanna, Instructor

NIH	Drug Metabolism and Biochemical Pharmacology*

* Staff member is co-investigator of this project.

ATTACHMENT II

AVAILABLE RESEARCH SPACE

TOTAL AREA 14,675 sq. ft.

Department of Physical Medicine and Rehabilitation

RESEARCH

A. Objectives

The program for the development of research in the broad field of rehabilitation has been continued in accord with the objectives stated at the time the RT-2 Center was established.

1. To develop a permanent research staff to conduct research in the various aspects of rehabilitation.

2. To promote interdisciplinary research on multi-factorial problems in rehabilitation.

3. To identify the significant problems which impede rehabilitation and develop research studies to help solve those problems.

4. To test in the application of rehabilitation the concepts, methods and procedures derived from research.

5. To conduct graduate education in research in rehabilitation.

B. Research in the Department of Physical Medicine and Rehabilitation, University of Minnesota

Research has been developed as broad programs of investigation of the major problems which are obstacles to successful rehabilitation of disabled or chronically ill patients. As a result there is a continuity of the research program, with the results of current studies indicating the direction for continuing studies. The programs of research undertaken have been indicated by major needs of patients who have been treated in rehabilitation. The common problems which cause continuing or increasing physical and economic dependency, and which consign not only the patient but often the family to a disadvantaged position in the community, have been given priority. Since, in concept, a patient is not rehabilitated until he can return to his home as a productive member of his community, each program presents a broad range of problems which may vary from the pathophysiology of cells and organs to homeostasis of the patient, psychological adjustment, interpersonal psychologic problems of the patient with his family and community, educational training, and vocational rehabilitation. The breadth of the problems requires the participation of research workers from many of the health professions to investigate aspects specific to each specialty and also to participate in broader multi-professional studies. Within the capabilities of the staff,this Research and Training Center has been trying to develop such a research program.

Another category of research deals with the process of comprehensive rehabilitation. As the practice of medicine has developed from a limited concern for acute, episodic, life-threatening illnesses in which the physician's role was often nonspecific support to the present status of potent methods for attacking disease and influencing survival, the systems for delivery of health services have become increasingly important. Comprehensive medical care requires continuity, and continuity, in turn, requires systematic organization. Development of effective and efficient systems to provide health services requires research. Questions regarding training and use of manpower, facilities, triage, utilization of services, and others need to be investigated. In the same way, research is needed to develop more effective methods of educating doctors, allied health professions, patients, families, and the public regarding the use of modern medical and health systems.

The major categories of disease causing chronic disability are cardiovascular disease including stroke, rheumatic diseases, accidents, congenital diseases and disabilities, and neurologic diseases. These diseases have been the focus of our research programs. In general, the research has been oriented to the problems involved in the restoration of the impaired individual to a higher level of performance, both by psychophysiological adaptation of the individual and also by alterations in his environment. Some of the research has been devoted to the development of better methodology needed to be able to study these problems.

Cardiovascular disease has been of research interest to this department with support from VRA even prior to the establishment of the RT-2 program. As a result of this continuing research, a radio-frequency impedance cardiometer has been developed which, without any need for puncturing the skin or entering the circulation, can measure and record changes in cardiac contraction and cardiac blood flow while the patient is carrying on activity. This device appears to be a practical clinical tool for doctors to use to evaluate the status of the heart both in acute disease and in the course of rehabilitation. This appears to be the first device which has practical usefulness to evaluate the work of the heart of a cardiac patient in an objective manner during the course of rehabilitation. Similarly, a series of studies have been conducted on the peripheral circulation to define the limitations of function resulting from vascular disease.

Ischemic ulcers have been a major problem of patients immobilized by neuromuscular, metabolic or orthopedic diseases. These ulcers contribute both to morbidity and mortality. They are the second most common cause of death in paraplegic and quadriplegic patients. The cost of treatment of an ischemic ulcer in one of these patients is staggering - estimated to average 3 months of hospitalization at

a cost exceeding $3000. A series of studies are being conducted on the pathogenesis, methods of prevention, and treatment of ischemic ulcers. Psychological studies are also in progress to learn how to obtain the cooperation of the patient in prevention of ulcers.

Changes secondary to the immobilization resulting from disability are also being studied. Osteoporosis, loss of muscular strength, contractures of connective tissue, deterioration of the urinary system, and deterioration of nervous and intellectual function are included in the research program. These secondary degenerative changes are common to all of the disabilities which result in limitation of activity. Therefore, there are numerous interrelationships and interactions between the research projects. The results of one study may provide information applicable to another, or the findings in two or more studies may suggest a further course of fruitful study.

The studies of congenital neurologic impairments have much in common with studies of adult neurologic disease. Out of these studies the development of intramuscular motor neurolysis has produced a method for specifically localized relief of spasticity which has wide clinical applicability. This may be the most effective method yet developed to reduce spasticity in neurological disease so that spastic patients may gain useful control of their extremities.

Psychologic research is also an important part of the program. These studies have been concerned with better methods of assessment, better methods to achieve adaptation, and improved methods of education. Methods of behavior modification and counseling of patients and families are also under study.

In all of this research we have appreciated the opportunity to work as a research center under RT-2 so that a coordinated program might be developed. The opportunities for interaction in such a program increase productivity, stimulate new ideas and increase multiprofessional cooperation in research.

Principal Investigator	Title of Project	Amount	Source
Anderson, M.D., Clinical Professor	Rehabilitation Predictors in Completed Stroke (Formerly "Rehabilitation Predictors in Cerebrovascular Disease")	$80,000	Federal
Leslie, M.D., Clinical Professor	The Development of a Stroke Rehabilitation Management Simulator	11,500	Federal
	Further Development of the Kenny Self-Care Evaluation	10,000	Federal
Kubicek, Ph.D., Professor	Determination of Cardiac Output by an Electrical Impedance Method	58,688	Federal
Houle, M.D., Clinical Professor	Evaluation of Cardiac Output & Metabolism During Graded Physical Exercise & Validation of the Impedence Method for the Assessment of Cardiac Output	37,013	Federal
Price, M.D.	Studies of Urologic Function in Patients Following Spinal Cord Injuries	65,336	Federal
Schoening, M.D., Clinical Assistant Professor	Follow-up Clinic for Paraplegia and Quadriplegia	10,000	Federal
Houle, M.D., Clinical Instructor	Study of Pressure Relieving Devices for Sitting Position	4,862	Non-Federal
Cole, M.D., Associate Professor	The Waterbed for Treatment of Decubitus Ulcers	6,899	Federal
Dinsdale, M.D., Research Fellow	Study of the Pathogenesis of Decubital Ulcers	12,157	Federal

Principal Investigator	Title of Project	Amount	Source
Mosharrafa, Ph.D., Assistant Professor	Mass Spectrometry in Biomedical Research	$34,719	Federal
Patterson, MS.E.E.	Development of Automatic Data Computation	7,261	Federal
Awad, Ph.D., Associate Professor	Study of the Changes in the Structure, Ultrastructure, Innervation, and Enzymes of Skeletal Muscle in Neuromuscular Disease	36,371	Federal
Mundale, M.D., Assistant Professor	Quantitative Studies of Muscular Strength and Muscular Work	40,147	Federal
Keller, O.T.R.	Establishing Norms for Strength in Coordination Tests for Use with a Disabled Population	9,000	Federal
Schoening, M.D.,Clinical Assistant Professor	Studies on Pelvic Stabilization During Contraction of the Knee Extensors	7,349	Federal
Cole, M.D.,Associate Professor	Study of the Mechanical Effects of Low Frequency Ultrasound on Connective Tissue	13,651	Federal
Kubicek, Ph.D., Professor	Studies of the Effects of Betahistine HCL on Intracranial and Extracranial Blood Flow	40,350	Federal
Matthews, Ph.D.,Assistant Professor	Development of a Computer Based System for Data Storage and Retrieval	20,080	Federal

Principal Investigator	Title of Project	Amount	Source
Knapp, M.D.,Clinical Professor	Continuing Education of General Physicians in Rehabilitation Medicine	$20,909	Federal
Briggs, Ph.D., Professor	Medical School Student Discussion Project	14,955	Federal
Malof,Ph.D.,Assistant Professor	Process Variables in Student-Tutor Interactions Affecting Successful Academic Outcome	2,782	Federal
Roberts,Ph.D.,Associate Professor	Personality and Biographical Factors Influencing Occupational Choice and Satisfaction Among Occupational and Physical Therapists	9,352	Federal
	Review of the Literature Relating to the Porteus Maze Test	7,728	Federal
Halpern,M.D.,Associate Professor	Training Program for Upper Extremity Activities in Athetoid Patients	88,798	Federal
	Alteration of Excessive Muscular Tone of Patients by Intramuscular Neurolysis with Dilute Phenol Solutions	17,998	Federal
Kottke,M.D.,Ph.D., Professor	Effect on Posture of Obtunding Sensory Stimuli Evoking Tonic Neck Reflexes	35,386	Federal
Halpern,M.D.,Associate Professor	Evaluation and Rehabilitation of Children with Meningomyelocele Defects	56,291	Federal
	Studies on the Postural Orientation in Children with Central Nervous System Disease	14,770	Federal

Principal Investigator	Title of Project	Amount	Source
Silberberg,Ph.D.	Kenny Rehabilitation Institute Day Care Center	$ 5,000	Federal
Halpern,M.D.,Associate Professor	Studies of Selective Interruption of Small Myelinated Nerve Fibers	8,930	Federal
Kottke,M.D.,Ph.D., Professor	Research on Osteoporsois in Patients with Metabolic Disturbances Due to Limitation of Activity or Inflammatory Disease	11,367	Federal
	Functional Orthetics for Patients with Neuromusculoskeletal Disabilities	42,649	Federal
Anderson,M.D.,Clinical Professor	Prosthetic and Adaptive Equipment Development	7,000	Federal
Allison,M.S.,R.P.T., Assistant Professor	Study of a Device to Support Unstable Feet in Children	10,811	Federal
Wenmark, R.N.,Nurse	Evaluation of Rehabilitation Equipment	3,000	Federal
Briggs, Ph.D.,Professor	The Development of a Test to Assess Deficits in Perceptual Organization in Young Children	4,127	Federal
	Preparation of the Motor Battery for Use as a Clinical Assessment Technique	7,130	Federal
Burns, M.A.	An Investigation of the Relationship Between Cerebral Damage and Temporal Perception in a Hemiplegic Population	3,000	Federal

Principal Investigator	Title of Project	Amount	Source
Silberberg, Ph.D.	The Effect of Brain Injury on Smoking Habits	$ 3,000	Federal
Rosenberg, Ph.D.,Clinical Associate Professor	A Family Intake Conference as a Tool for Evaluation of Children in the Department of Physical Medicine and Rehabilitation	10,383	Federal
Leslie,M.D.,Clinical Assistant Professor	Rehabilitation Center Feedback System		
Lassman, Ph.D., Professor	Speech, Language, and Hearing of Persons with Seizures after Temporal Lobectomy	3,416	Federal
	Hearing, Language, and Speech in a Lower Socio-Economic Population of Children	3,963	Federal
	Speech, Language, and Hearing of Three-Year-Old Children	9,285	Federal
	Speech, Language, and Hearing of Eight-Year-Old Children	3,212	Federal
	Amplitude of Auditory Evoked Scalp Potentials as a Function of Co-varying Intersignal Interval and Intensity	3,518	Federal
	The Comparative Incidence and Quality of Echoic Response Behavior in Two Cultural Samples	2,349	Federal
	Effect of Natural Sleep and Sedated (Chloral Hydrate) Sleep upon the Auditory Evoked Potential	3,358	Federal

Principal Investigator	Title of Project	Amount	Source
Roberts, Ph.D., Associate Professor	Development of a Two-Handed Coordination Test	$ 8,623	Federal
Briggs, Ph.D., Professor	Preliminary Inquiry into the Usefulness of Personality Testing in Traffic Accident Prediction	9,757	Federal
Roberts, Ph.D., Associate Professor	Relationship of WAIS Factor Scores to Behavior in Brain Damaged Subjects	18,232	Federal
Briggs, Ph.D., Professor	Study of Seven Historical Factors in Samples of Young Male and Female Delinquents using the M-B History Questionnaire	4,686	Federal
Kubicek, Ph.D., Professor	Continuation of the Evaluation, Validation and Improvement of the Impedance Cardiograph for an in-flight Experiment.	87,299	NASA
Zaki, Ph.D., Associate Professor	Fetal and Neonatal Liver Injury	19,516	U.S. Public Health Funds
	Myopathy in Nutritional Injury	25,484	U.S. Public Health Funds

Research space in the Department of Physical Medicine is approximately 6950 sq. feet.

DEPARTMENT OF PHYSIOLOGY

The research programs of the Department of Physiology at the University of Minnesota include a wide range of objectives varying from a theoretical and mathematical treatment of population dynamics to a clinical study of anti-fibrillatory agents. The extent of the programs is reasonably well shown by the following list of research projects presently receiving support. The list is not quite complete, as some of the theoretical studies are carried on without funding from outside the department.

Principal Investigator	Title of Project	Amount	Source
H. Mead Cavert Professor	Sugar transport by isolated contracting muscle. Contractile work and sugar transport in heart.	$15,000	Federal
Eugene Grim, Professor	Movement of water and ions in in viscera.	22,000	Federal
John A. Johnson, Professor	Transport in isolated perfused heart.	26,000	Federal
Nathan Lifson, Professor	Absorption by dog intestinal mucosa in vitro.	22,000	Federal
Victor Lorber, Professor	Ion fluxes in cardiac muscle.	17,000	Private
Carlo Terzuolo, Professor	Problems in nerve cell physiology.	17,000	Federal
	Systems analysis of sensory and motor cells.	33,000	Federal
M. B. Visscher, Regents Professor	Heart circulation studies.	32,000	Federal
	Historical review of reciprocal impacts on science.	8,000	Private
Marvin Bacaner, Associate Professor	Measurement of regional circulation with radioisotopes.	16,000	Federal

Principal Investigator	Title of Project	Amount	Source
Marvin Bacaner, Associate Professor	Bretylium study.	$23,000	Private
I. J. Fox, Associate Professor	Hypotension from polymers and hypertonic solutions.	22,000	Federal
	Hypotension from polymers and and hypertonic solutions.	3,000	Private
	Left ventricular baroceptor function	11,000	Federal
R. B. Harvey, Associate Professor	Renal concentrating mechanisms.	25,000	Federal
Jui S. Lee, Associate Professor	Mechanism of water absorption from intestine.	21,000	Federal
	Effect of cholera toxin on intestinal transport.	29,000	Federal
James Beck, Assistant Professor	Biochemical structure and aging of RBC membrane.	1,000	University
David Levitt, Assistant Professor	Electrical parameters of intestinal mucosal cells.	4,000	University
Richard Poppele, Assistant Professor	Factor in reflex muscle control.	14,000	Federal
Richard Purple, Assistant Professor	Studies on integrative mechanisms of neurons.	22,000	Federal
Maurice Meyer, Lecturer	Circulation in teeth and supporting structures.	17,000	Federal

The space available in the department for these research activities is approximately 20,100 square feet. All of this serves the usual dual purpose of also being utilized for graduate student thesis projects.

Department of Psychiatry

Research Program

The research activities currently under way in the Department are of a diverse nature but can be subsumed under two headings: clinical and basic. There is no general direction to these various projects in the sense that all the investigators are working on some common project. Each investigator or group is following his own interests, but, as will be noted, all of the projects have direct bearing on some clinical problem.

In the proposed new building there is currently no plan for space for psychiatric research activities. Current research space and laboratories will be retained.

Tabular form research space is attached.

Current Grants

Early Clinical Drug Evaluation Unit, Dr. B. C. Schiele, principal investigator. Grant period is 5-1-69 to 4-30-70. Amount is $187,403.00. Grantor is U. S. Public Health Service.

Adult Adjustment of Adolescent Patient Groups, Drs. A. J. Hafner and W. Quast, principal investigators. Grant is in third of four year project. Amount is $56,865.00. Grantor is U. S. Public Health Service.

Drug Self-Administration by Animals, Dr. T. Thompson, principal investigator. Grant period is 4-1-69 to 3-31-70. Amount is $45,603.00. Grantor is U. S. Public Health Service.

Psychophysiological Arousal in Schizophrenia, D. T. Lykken, principal investigator. Grant year is 6-14-68 to 5-31-69. Amount is $25,157.00. Grantor is U. S. Public Health Service.

Research Fellowship Supply Award, D. T. Lykken, awardee. Grant year is 9-1-68 to 8-31-69. Amount is $1000.00. Grantor is U. S. Public Health Service.

Operant and Ethological Analyses of Aggressive Behavior, Dr. T. Thompson, principal investigator. Grant period is 10-1-68 to 9-30-70. Amount is $34,500.00. Grantor is U. S. Public Health Service.

Current Grants (cont.)

Two projects are being done on state funds and no accounting of the cost has been possible:

1. Psychotherapy Research Unit under Drs. Cline and Hathaway is studying the therapy of selected patients using all members of the staff as therapists (nurses, occupational therapists, aides, orderlies, psychologists, psychiatrists, social worker).

2. A transsexual research project in cooperation with the Department of Surgery. This project has as its goal a ten year follow-up study of 25 operated male transsexuals to determine their emotional, sexual, social and economic adjustments now living as women. Principal investigator is D. W. Hastings, M. D.

Pending Project

Psychological, Physical and Biochemical Responses to the Stress of Officer Training. Principal investigator is David Cline, M. D. Fund request for statistical treatment of data already collected has gone to the University of Minnesota Graduate School.

UNIVERSITY OF *Minnesota*

UNIVERSITY HOSPITALS · MINNEAPOLIS, MINNESOTA 55455

June 23, 1969

TO: Robert O. Mulhausen, M.D., Assistant Dean
FROM: H. O. Peterson, M.D., Professor and Head, Department of Radiology
SUBJECT: AIMS AND OBJECTIVES OF RESEARCH IN THE DEPARTMENT OF RADIOLOGY

As you will observe from the attached list of research projects currently being pursued in the Department of Radiology, the efforts are extensive and envelop a broad spectrum of interests and disciplines. The common denominator for all of these programs is the development and potential application of laboratory findings to clinical usage. This array of interests is not only a matter of choice but is also one of necessity. One of the important functions of this Department is to train residents in the radiological sciences. We feel this training can be re-enforced and more effective by actively encouraging the residents to participate, under direct faculty supervision, in laboratory research. By fostering this, we feel, we produce well-rounded qualified radiologists. Ancillary to this we hopefully induce more of them to choose an academic career, in keeping with the development of "National Centers of Excellence" in medicine.

SPACE AVAILABLE

Presently, the Department has 6,259 square feet of research oriented space. This space consists of:

Laboratory Space	2,473 square feet
Animal Quarters	2,355 " "
Offices	158 " "
Services	1,273 " "

Harold O. Peterson, M.D.
Professor and Head
DEPARTMENT OF RADIOLOGY

HEALTH SCIENCES CENTER

RESEARCH PROGRAMS BEING CARRIED OUT IN THE DIVISION OF RADIATION THERAPY

Investigator	Title	Amount	Source
Yosh Maruyama, M.D.	Radiobiology of Mouse Lymphoma Cells	$11,000	National Academy of Sciences - Picker Foundation
	Study of Spleen Lymphoma Colony Forming Cells	10,295	American Cancer Society-Minn. Div.
K. K. Charyulu, M.D.	Chronic Effects of CNS Irradiation in Rabbits	500	Expenses Charged to Radiation Therapy Research Fund
	Radiation Reactions of skin under enhanced oxygen tension studies by intra-arterial gaseous perfusion	500	Expenses charged to Radiation Therapy Research Fund
A. Sundarsanam, M.D.	Effect of combined Actinomycin D and x-ray therapy on renal hypertrophy after unilateral nephrectomy	2,250	American Cancer Society Institutional Grant
V. T. Fallon, M. D.	Evaluation of swine skin reaction to x-rays: Study of moist reaction therapy with topical steroids	2,888	American Cancer Society Institutional Grant
Robert Anderson, M.D.	The dosimetry of irregularly-shaped Radiation Therapy fields	950	American Cancer Society Institutional Grant
E. W. Hahn, Ph.D.	Acute effects of irradiation on on thyroid activity	2,815	American Cancer Society Institutional Grant
J. Holder, M.D.	Effect of actinomycin D (AMD) and x-irradiation on the regenerating mouse liver	2,500	American Cancer Society Institutional Grant
J. Thomson, M.D.	Evaluation of the effect of cytosine arabinoside (CTA and/or radiation on the Zimmerman Mouse Ependymoblastoma Transplants in the mouse brain	2,976	American Cancer Society Institutional Grant

Investigator	Title	Amount	Source
G. Sower, B.S.	Irradiation induced maternal dysfunction as a contributing factor to embryonic mortality and teratology during the postimplantation stage	$ 1,400	U.S. Public Health Service Clinical Cancer Training Grant-Fellowship and Supplies
V. Moore, Ph.D.	Use of program console in radiation treatment planning	500	Expenses charged to Radiation Therapy Research Fund
E. Valentini, M.D.	Irradiation induced maternal dysfunction as a contributing factor to embryonic mortality during the preimplantation stage	66,332	U.S. Public Health Service Radiation Therapy, Physics and Biology Training
J. Beggs, B.S.	Radiation dosimetry using lif rods		
J. Giganti, M.S.	Use of P in junctive diodides for radiation dosimetry		
F. Khan, M.S.	Dose distribution problem in cobalt-60 teletherapy		
P. Bagley, M.D.	Enhancement of radiation reaction by actinomycin D on skin of mice		
V. T. Fallon, M.D.	Treatment of brain tumors with radio-gold		
	Treatment of brain tumors with radio-gold	26,307	U.S. Public Health Service Integrated Study of Advanced Malignant Disease Radiation Therapy Portion

Principal Investigator	Title	Amount	Source
F. Khan, M.D.	Dose distribution problem in in cobalt-60 teletherapy	$ 6,000	U.S. Public Health Service Clinical Cancer Training Grant Radiation Therapy Portion
E. Hahn, Ph.D.	Advisor for E. Valentini, M.D., G. Sower, B.S., J. Thomson, M. D. and J. Holder, M.D.		

LIST OF RESEARCH PROGRAMS BEING CARRIED OUT

IN THE DIVISION OF DIAGNOSTIC RADIOLOGY

ɔert Jeffery, M.D., Kurt Amplatz, M.D. Dysplastic Pulmonary Valve	NIH	$ 995.00
Robert Carlin, M.D., Kurt Amplatz, M.D. Downstream Versus Upstream Angiography	PHS	$ 138.50
Kurt Amplatz, M.D. Development of Nonthrombogenic Catheter	None	
Kurt Amplatz, M.D. Development of See-Through Film Changer	Private	$ 5,000.00
Gustave Formanek, M.D., Kurt Amplatz, M.D. Iatrogenic Thickening of Pulmonary Valve Following Banding	Grad. Sch.*	
Gustave Formanek, M.D., Kurt Amplatz, M.D. Mechanism of Vascular Enlargement Due to Increased Blood Flow: An Experimental Study	Grad. Sch.*	
Kurt Amplatz, M.D. Diagnostic and Therapeutic Renal Cyst Biopsy	ACS*	
Thomas Imray, M.D., Kurt Amplatz, M.D. Pitfalls of Pneumocardiography in the Evaluation of Pericardial Effusion	None	
Eugene Gedgaudas, M.D. Bowel Changes after Mesenteric Artery Infarction	Dept. Funds	
Eugene Gedgaudas, M.D. Radiolucent Bands in Cholecystogram	Dept. Funds	
Eugene Gedgaudas, M.D. Healing of Malignant Ulcers	Dept. Funds	
Stephen A. Kieffer, M.D. Correlation of Discography and Anatomy in Evaluation of Changes with Age in the Intervertebral Disc	VA	$ 1,500.00
Stephen A. Kieffer, M.D., Harold O. Peterson, M.D., Lawrence H. A. Gold, M.D. Large Volume Pantopaque Myelography in Evaluation of Diseases of the Spinal Canal	Private	$ 1,500.00
Stephen A. Kieffer, M.D., Virgil T. Fallon, M.D., G. J. D'Angio, M.D. Intrathecal Radiogold in the Treatment of Spinal Axis Metastases	PHS	$ 5,000.00

* equested, but not as yet funded

Stephen A. Kieffer, M.D., Merle Loken, M.D., Anton Nesse, M.D. Cerebral Radioisotope Arteriography	Dept. Funds	$ 1,000.00
Justin J. Wolfson, M.D. A Clinical, Radiographic and Pathologic Correlative Study of Pediatric Pulmonary Disease	PHS	$18,177.00
R. A. Chilgren, M.D., Justin J. Wolfson, M.D. Audiovisual Aids: A Pilot Study	Med. Sch.	$ 1,500.00
Lawrence Gold, M.D. Evaluation of the Relative Toxicity of Renograffin-60, Conray, and Hypaque-50	None	
Lawrence Gold, M.D. Pneumoencephalographic Evaluation of Cerebral Atrophy in Children	None	
Lawrence Gold, M.D. The Value of Thermography in Cerebrovascular Disease	PHS	$11,400.00
Lawrence Gold, M.D. Idiopathic Scoliosis: Myelographic Evaluation	None	
Lawrence Gold, M.D. Cerebral Embolism in Monkeys: Evaluation of Collateral Blood Flow	None as yet	
Philippe L'Heureux, M.D., Richard V. Ebert, M.D. Pulmonary Function: Regional Evaluation in Pulmonary Emphysema	NIH	$14,421.00

DIVISION OF RADIOTHERAPY

Staff and General Areas of Interest

4 Physicians (M.D.) (2 Assoc. Prof., 2 Instructors)

Clinical research and patient care

3 Physicists (Ph.D.) (1 Asst. Prof., 2 Instructors)

(2 MS.) Dosimetry, Computer application to Radiotherapeutic sciences, Instrumentation, X- & gamma-ray generators, radioactive materials.

1 Radiobiologist (Ph.D.) (Asst. Prof.)

Radiobiology at whole animal level.

10 Medical fellow-grad student trainee

Research Space and Program

Program : Research

Teachings and research in: Cellular radiobiology, Biochemistry, whole animal radiobiology, combined drug-radiation effect, radiation and fertility, perfusion of limbs and organs, Radiosensitizers and protectors. Dosimetry. Radiological physics. Tracers and isotopes for therapy and metabolisim.

Space

About 5000 Sq. feet

General laboratory and animal space

X-radiation Machine

Clinical Program:

850 - 900 new cancer patients treated annually

		Amount
1.	Principle Investigator: Dr. Yosh Maruyama Title of Project: Radiobiology of Spleen and Bone Marrow Colony Forming Cells. Source of Funds: American Cancer Society	$10,295
2.	Principle Investigator: Dr. James Thomson Title of Project: Evaluation of the Effect of Cytosine Arabinoside (CTA) and/or radiation on the Zimmerman Mouse Ependymoblastoma Transplanted in the Mouse Brain. Source of Funds: American Cancer Society	$ 2,976
3.	Principle Investigator: Dr. Robert Anderson Title of Project: The Dosimetry of Irregularly shaped Radiation Therapy Fields. Source of Funds: American Cancer Society	$ 950
4.	Principle Investigator: Dr. Eric Hahn Title of Project: Acute Effects of X-Irradiation on Thyroid Activity. Source of Funds: American Cancer Society	$ 2,815
5.	Principle Investigator: Dr. Anam Sudarsanam Title of Project: Effect of Combined Actinomycin D and X-ray Therapy on Renal Hypertrophy after Unilateral Nephrectomy. Source of Funds: American Cancer Society	$ 2,250
6.	Principle Investigator: Dr. B.J. Kennedy and Cancer Coordinating Committee Title of Project: Integrated Study of Advanced Malignant Diseases Source of Funds: National Institute of Health	$26,307
7.	Principle Investigator: Dr. Yosh Maruyama Title of Project: Study of Radiation Responses of Murine Lymphoma Cells. Source of Funds: National Academy of Sciences - James Picker Foundation	$10,000
8.	Principle Investigator: Dr. Yosh Maruyama Title of Project: Radiotherapy, Physics, Biology Training Grant Source of Funds: United States Public Health Service	$66,332

DEPARTMENT OF SURGERY

GENERAL SURGERY STAFF 1969

JOHN S. NAJARIAN, M.D.	PROFESSOR AND CHAIRMAN
RICHARD L. VARCO, M.D.	PROFESSOR
RICHARD C. LILLEHEI, M.D.	PROFESSOR
CHARLES F. MCKHANN, M.D.	PROFESSOR
EUGENE F. BERNSTEIN, M.D.	ASSOCIATE PROFESSOR
ALDO CASTANEDA, M.D.	ASSOCIATE PROFESSOR
ARNOLD LEONARD, M.D.	ASSOCIATE PROFESSOR
ALBERT SULLIVAN, M.D.	ASSOCIATE PROFESSOR
JOHN P. DELANEY, M.D.	ASSOCIATE PROFESSOR
THEODOR GRAGE, M.D.	ASSOCIATE PROFESSOR
HENRY SOSIN, M.D.	ASSISTANT PROFESSOR
RICHARD L. SIMMONS, M.D.	ASSISTANT PROFESSOR
ROBERT L. GOODALE, M.D.	ASSISTANT PROFESSOR
VICTOR GILBERTSON, M.D.	ASSISTANT PROFESSOR
HENRY BUCHWALD, M.D.	ASSISTANT PROFESSOR

CURRENT AND PENDING RESEARCH FUNDS
DEPARTMENT OF SURGERY
JUNE 1969

RINCIPAL INVESTIGATOR ACADEMIC TITLE	TITLE OF PROJECT	SOURCE OF FUND	STATUS	CURRENT AWARD
Dr. John S. Najarian Professor and Chairman	Studies of Organ Transplantation in Animals and Man	Federal	Current	$ 303,296
	Cardiopulmonary Transplantation	Private	Current	$ 49,470
Dr. Charles F. McKhann Professor of Surgery	Studies of Anti-geneic Properties of Malignant Cells Grown In Vitro	Private	Current	$ 10,000
	Tumor-Specific Transplantation Antigens in Solid Tumors	Federal Contract	Current	$ 54,565
	Antigenic Properties of Malignant Cells	Federal	Current	$ 47,143
	Tumor-Specific Transplantation Antigens in Solid Tumors	Federal	Current	$ 335,086
Dr. Richard L. Varco Professor of Surgery	Hypocholesterolemia	Private	Current	$ 13,000
	Planning a Cardiovascular Center	Federal	Current	$ 41,000
	Studies on the Mechanism of Allograft Rejection	Federal	Current	$ 39,927
	Pulmonary Effects on Moving Blood	Federal	Pending	
Dr. Richard C. Lillehei Professor of Surgery	Treatment of Shock Based Upon Physiological Principles	Federal	Current	$ 35,572
	Development of Methods for Freezing and Thawing Whole Organs	Federal	Current	$ 32,527
	Cause and Prevention of Irreversible Shock	Federal	Current	$ 38,000
	Survival of Organs Under Various Experimental Conditions	Federal	Current	$ 25,000

PRINCIPAL INVESTIGATOR ACADEMIC TITLE	TITLE OF PROJECT	SOURCE OF FUND	STATUS	CURRENT AWARD
Richard C. Lillehei (continued)				
	Research in Shock	Private	Current	$ 90,860
	Surgical Research	Private	Current	$ 1,000
Dr. Eugene F. Bernstein (Leaves this Institution on June 20, 1969; Graduate Training Grant in Surgery and Mechanical Engrg. remains)	Graduate Training Grant in Surgery and Mechanical Engineering	Federal	Current	$ 79,264
	Development of A Mechanical Heart	Federal (Transfer to University of California authorized)	Current	$ 16,997
	Evaluate Effects of Prosthetic Heart Devices	Federal (Transfer to University of California authorized)	Current	$ 64,737
Dr. Arnold Leonard	A Dissection of the Factors Responsible for Alteration of Renal Function and Blood Flow in the Kidney as it is Excised and Perfused in an Ex Vivo State	Grad.School	Current	$ 3,000
	Computer Facility for Medical Patient Monitoring	Federal Contract	Pending	
	Ex Vivo Isolated Organ Perfusion	Federal	Current	$ 24,574
	Study of Cardiodynamics in Newborn Puppies Subjected to Shock	Federal	Pending	
	Hypothalamics and Ulcer Formation	Federal	Current	$ 16,174
	Reduction of Infant Mortality	Federal	Pending	

PRINCIPAL INVESTIGATOR ACADEMIC TITLE	TITLE OF PROJECT	SOURCE OF FUND	STATUS	CURRENT AWARD
Dr. Richard L. Simmons Assistant Professor of Surgery	The Antigenicity of Trophoblast	Graduate School	Current	$ 2,700
	Choriocarcinoma and the Antigenicity of Trophoblast	Private	Pending	
	Studies of Biological Adhesives	Private	Current	$ 12,832
	Immunological Reactivity in Special Circumstances	Federal	Current	$ 19,358
Dr. Theodor Grage Assistant Professor of Surgery	Malignant Tumors Under Conditions of Hypothermia	Private	Current	$ 18,000
Dr. Henry Sosin Assistant Professor of Surgery	Gastric Antral and Fundic Blood Flow	Federal	Current	$ 19,358
	Measurement of Serum Gastrin Levels and Their Correlation With Gastric Antral Blood Flow and States of Antral Function	Graduate School	Current	$ 2,700
	Effect of Vitamin B_{12} Deficiency Upon Incidence of Spontaneous and Induced Adenocarcinoma of the Stomach	Private	Pending	
Dr. Henry Buchwald Assistant Professor of Surgery	Illeal Bypass Effect of Cholesterol and Atherosclerosis	Federal	Current	$ 31,515

PRINCIPAL INVESTIGATOR ACADEMIC TITLE	TITLE OF PROJECT	SOURCE OF FUND	STATUS	CURRENT AWARD
Dr. John P. Delaney Assistant Professor of Surgery	Control of Gastric Mucosal Cellular Populations	Federal	Current	$ 17,372
	Physiologic and Pathologic Influences on Tissue Blood Flow With Special References to Arteriovenous Anastomoses	Private	Current	$ 19,757
	Automated Gastric Neutralization	Graduate School	Pending	
	Surgical Source Books	Graduate School	Current	$ 1,600

Several of our residents also have been granted small awards by private foundations for financial assistance in their research.

DEPARTMENT OF SURGERY
RESEARCH SPACE

RESEARCH PROGRAM	SPACE AVAILABLE
Malignant Disease	2,327 square feet
Transplantation	2,913 square feet
Cardiovascular	2,075 square feet
Pediatric Surgery	536 square feet
Gastroenterology	2,003 square feet

UROLOGY

Urology Grants 1969 - 1970 -

1. PHS Training Grant in Urology, 1960-70 - $19,315.00 (direct costs)

2. Dr. Fraley - Graduate School Funds (Research) - $6,300.- 428-0303-4909-02

Voluntary Donations

Urological Research Malignancy Disease Fund - 0697-5813

Urology Baker Fund - 0697-5967-07

Urological Laboratory Research Fund - 5979

INVESTIGATORS

1. Dr. Elwin E. Fraley - Professor and Chairman

2. Dr. Colin Markland - Associate Professor

Amount of research space -

Mayo	B-178	- 153 sq.ft.
"	B-195	- 124 "
Diehl	F-119	-246 "
"	F-130	- 936 "
	Total	-1,459. sq.ft.

MEMO

TO: Dr. Robert Mulhausen

FROM: Dr. H. Sauls (for Dr. John Anderson)

SUBJECT: Proposed use of Pediatric Laboratory space in Building A

I. Common use facilities

A. Radioisotope Laboratory

A radioisotope laboratory with two special hoods will be available for handling of concentrated radio chemicals. Dilution of radioactive materials, column chromatography, labeling of proteins, storage, and disposal of radio chemical waste will be handled in this room.

B. Chromatography Laboratory

A chromatography laboratory for paper and this layer chromatography equipped with special temperature and humidity control and high air turnover, space for developing and drying chromatograms, and storage of volatile solvents will be available.

C. Electron microscopy preparation room and electron microscope and dark room will be available for joint use of bacteriology, virology, cell and tissue culture, renal pathology and gastroenerology.

D. Instrument room

Designed primarily to contain large common use instruments such as aminoacid analyzer, recording spectrophotometer, infrared spectophotometer, ultracentrifuges, etc.

E. Service facilities

1. Dishwashing
2. Sterilization
3. Cold room
4. Freezer room
5. Service room - ice maker, dry ice, liquid nitrogen, distilled water, and carbon dioxide tank storage.

These central facilities will serve all laboratories in building A and B.

II. Laboratories for specific areas of investigation

A. Endocrinology and steroid biochemistry (placental-fetal steroid metabolism)

B. Neonatal physiology: neonatal energy metabolism

C. Protein biochemistry: the biochemistry of granulocyte function

D. Amino acid biochemistry: the metabolism of amino acids related to birth defects

E. Clinical pharmacology: fetal and neonatal drug metabolism

F. Virology

G. Microbiology

H. Tissue culture laboratory

I. Gastrorenterology laboratory

J. Carbohydrate enzymology and biochemistry of diabetes and hypoglycemia

K. Renal immunophathology laboratory

L. Membrane biochemistry

M. Renal ultrastructural pathology

RESEARCH PLANNED IN THE DEPARTMENT OF MEDICINE IN THE NEWLY CONSTRUCTED FACILITIES

The present research effort of the Department of Medicine has been described. No radical changes in the direction of research are planned during the next five years. Research in Hematology, Endocrinology and Metabolism, Renal Disease, Infectious Disease, Arthritis and Immunology, Clinical Pharmacology, and Medical Genetics are planned in the new building. Research in Cardiology, Pulmonary Disease, Oncology will remain in their present locations. Gastroenterology will probably also remain in the VFW Building, although this is not completely settled. The Clinical Research Center will remain in the Masonic Hospital. The direction of research will be the responsibility of the heads of the various sections. With the retirement of Dr. Spink new directions may develop in the research program in infectious disease. The replacement for Dr. Williams in Arthritis will develop a new program.

MEDICAL STUDENT SELECTION AND CLASS DATA

An established committee of the Medical School, the Medical School Admissions Committee, composed of nine voting members, including a medical student and a consultant from the Division of Clinical Psychology, and three ex-officio members, is charged by the faculty to select qualified applicants. Academic records; the results of certain tests including the Medical College Admissions Test, the Strong Vocational Interest Test, and the Miller Analogies Test; personal recommendations; and a personal interview with the applicant contribute to the judgment of the committee. After consideration of the applicants by the committee, a primary listing of accepted students in constructed. An alternate group is also picked in case those applicants on the primary list decline admission to the Medical School.

In 1969, the faculty of the Medical School adopted a policy which encourages acceptance of disadvantaged students into the Medical School curriculum. This policy has been implemented and several of these students will be admitted with the 1969-70 class.

The over-all attrition rate of medical students has not been greater than 5-6% for the last several years.

Approximately 50% of the graduates of the school continue to reside in the state.

The following tables statistically portray features of each of the entering classes of the last 6 years.

February 24, 1969

UNIVERSITY OF MINNESOTA
MEDICAL SCHOOL ADMISSION STATISTICS
Freshman Medical Class Entering Fall 1969

1969 Applicants (Number = 833)

Residents	414	Males	743
Non-Residents	419	Females	90

Applicants offered positions in 1969 class 188
Declined or withdrew 28
Residents 14
Non-Residents 14
Freshman Class for 1969, as of 2-24-69 = 160

1969 Entering Class (Number = 160)

Residents	145	(91%)	Males	140	(88%)
Non-Residents	15	(9%)	Females	20	(12%)

(Includes: Surrounding states = 10, Foreign = 0)

Total Grade Point Average

3.6 and higher	50	(31%)
3.1 - 3.5	85	(53%)
2.6 - 3.0	24	(15%)
less than 2.6	1	(1%)
Range	2.5 - 3.98	
Mean GPA	3.36	
Median GPA	3.42	

Pre-Medical Education

University of Minnesota	66	(41%)
Minnesota State Colleges	7	(4%)
Minnesota Junior Colleges*	0	
Minnesota Private Colleges	48	(30%)
Colleges in surrounding states	10	(6%)
Eastern Colleges	9	(6%)
Other	20	(13%)
*Attended for 2 years only		
With four years of college	135	(84%)

Medical College Admission Test Scores

Verbal Ability

700 and higher	5	(3%)
650 - 699	25	(16%)
600 - 649	27	(17%)
550 - 599	30	(19%)
500 - 549	41	(25%)
450 - 499	25	(16%)
less than 450	7	(4%)
Median - 565		

General Information

700 and higher	7	(4%)
650 - 699	25	(16%)
600 - 649	30	(19%)
550 - 599	49	(30%)
500 - 549	31	(19%)
450 - 499	14	(9%)
less than 450	4	(3%)
Median - 585		

Quantitative Ability

700 and higher	37	(23%)
650 - 699	43	(27%)
600 - 649	37	(23%)
550 - 599	28	(17%)
500 - 549	11	(7%)
450 - 499	3	(2%)
less than 450	1	(1%)
Median - 650		

Science

700 and higher	10	(6%)
650 - 699	31	(19%)
600 - 649	47	(30%)
550 - 599	38	(24%)
500 - 549	21	(13%)
450 - 499	11	(7%)
less than 450	2	(1%)
Median - 605		

	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969
# of Appl.	282	319	337	392	504	612	689	798	639	643	619	833
# Enrolled	135	137	134	147	152	155	156	153	163	160	161	

September 23, 1968

UNIVERSITY OF MINNESOTA
MEDICAL SCHOOL ADMISSION STATISTICS
Freshman Medical Class Entering Fall 1968

1968 Applicants (Number = 619)

Residents	346	(56%)	Males	559	(90%)
Non-Residents	273	(44%)	Females	60	(10%)

Applicants offered positions in 1968 class 211
Declined or withdrew 49
Residents 26
Non-Residents 23
Freshman class for 1968, as of September 23, 1968 = 162

1968 Entering Class (Number = 162)

Residents	146	(90%)	Males	145	(90%)
Non-Residents	16	(10%)	Females	17	(10%)

(Includes: Surrounding states = 12, Foreign = 2)

Total Grade Point Average

3.6 and higher	47	(29%)
3.1 - 3.5	79	(48%)
2.6 - 3.0	34	(21%)
less than 2.6	3	(2%)
Range	2.4 - 3.9	
Mean GPA	3.34	
Median GPA	3.4	

Pre-Medical Education

University of Minnesota	69	(42%)
Minnesota State Colleges	5	(3%)
Minnesota Junior Colleges*	2	(1%)
Minnesota Private Colleges	48	(30%)
Colleges in surrounding states	14	(9%)
Eastern Colleges	8	(5%)
Other	17	(10%)
*Attended for 2 years only		
With four years of college	130	(80%)

Medical College Admission Test Scores

Verbal Ability

700 and higher	4	(2)
650 - 699	16	(9)
600 - 649	23	(14)
550 - 599	35	(21)
500 - 549	34	(21)
450 - 499	39	(24)
less than 450	15	(9)

Median - 545

General Information

700 and higher	9	(6%)
650 - 699	21	(13%)
600 - 649	28	(17%)
550 - 599	41	(25%)
500 - 549	41	(25%)
450 - 499	18	(11%)
less than 450	5	(3%)

Median - 575

Quantitative Ability

700 and higher	32	(20%)
650 - 699	44	(27%)
600 - 649	51	(31%)
550 - 599	21	(13%)
500 - 549	13	(8%)
450 - 499	2	(1%)
less than 450	0	(0%)

Median - 645

Science

700 and higher	2	(1%)
650 - 699	15	(9%)
600 - 649	60	(37%)
550 - 599	52	(32%)
500 - 549	26	(16%)
450 - 499	5	(3%)
less than 450	3	(2%)

Median - 595

	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968
No. of Applicants	282	319	337	392	504	612	689	798	639	643	619
No. Enrolled	135	137	134	147	152	155	156	153	163	160	162

September 28, 1967

UNIVERSITY OF MINNESOTA
MEDICAL SCHOOL ADMISSION STATISTICS
Freshman Medical Class Entering Fall 1967

1967 Applicants (Number=643)

Residents	370 (58%)	Males	577 (90%)
Non-Residents	273 (42%)	Females	66 (10%)

Applicants offered positions in 1967 class		206
Declined or withdrew		40
Residents	25	
Non-Residents	15	
Enrolled in special programs (M.D.-Ph.D., Grad.)		5
Freshman class for 1967, as of 9-28-67		161

1967 Entering Class (Number=161)

Residents	153 (95%)	Males	149 (93%)
Non-Residents	8 (5%)	Females	12 (7%)

(Includes: Surrounding states, 4; Foreign, 1)

Total Grade Point Average

3.6 and higher	31%
3.1 - 3.5	48%
2.6 - 3.0	20%
less than 2.6	1%
Range	2.4 - 4.0
Mean GPA	3.33
Median GPA	3.35

Pre-Medical Education

University of Minnesota	84 (52%)
Minnesota State Colleges	2 (1%)
Minnesota Junior Colleges*	7 (4%)
Minnesota Private Colleges	50 (31%)
Colleges in surrounding states	4 (3%)
Eastern Schools	5 (3%)
Other	9 (6%)

*Attended for 2 years only

With 4 years of college 119 (74%)

Medical College Admission Test Scores

Verbal Ability

550 & higher	54%
500 - 549	22%
450-- 499	18%
less than 450	6%
Median - 555	

General Information

550 & higher	59%
500 - 549	23%
450 - 499	14%
less than 450	4%
Median - 560	

Quantitative Ability

700 & higher	22%
650 - 699	25%
600 - 649	25%
550 - 599	17%
500 - 549	9%
less than 499	2%
Median 645	

Science

700 & higher	2%
650 - 699	12%
600 - 649	20%
550 - 599	34%
500 - 549	25%
less than 499	6%
Median -575	

	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967
Number of Applicants	282	319	337	392	504	612	689	798	639	643
Number Enrolled	135	137	134	147	152	155	156	153	163	161

September 26, 1966

UNIVERSITY OF MINNESOTA
MEDICAL SCHOOL ADMISSION STATISTICS
Freshman Medical Class Entering Fall 1966

Number of applicants for classes entering:

1958	1959	1960	1961	1962	1963	1964	1965	1966
282	319	337	392	504	612	689	798	639

1966 Applicants	Number	Per Cent
Non-residents	338	53
Residents	301	47
Male	584	91
Female	55	9

Applicants offered positions in 1966 class		204
Declined or withdrew		40
Non-residents	19	
Residents	21	
Freshman class for 1966, as of 9/26/66		164

ENTERING CLASS (164) STATISTICS:

	Number	Per Cent
Male	156	95
Female	8	5

	Number	Per Cent
Residents	146	89
Non-residents	18	11
Includes:		
Surrounding states	5	
Foreign	1	

Total Grade Point Average

less than 2.6	4%
2.6-3.0	25%
3.1-3.5	53%
3.6 and higher	18%
Range	2.3-3.9
Mean GPA	3.25
Median GPA	3.3

Premedical Education	Number	Per Cent
University of Minnesota	81	50
Minnesota State Colleges	4	2*
Minnesota Junior Colleges	2	1*
Minnesota Private Colleges	52	32
Colleges in surrounding states	8	5
Eastern schools	4	2
Other	13	8
*Attended for one or two years only		
Four years of College	120	73

Medical College Admission Test Scores

Verbal Ability	Per Cent
less than 450	14
450-499	20
500-549	19
550 and higher	47

Quantitative Ability	
less than 450	0
450-499	4
500-549	18
550 and higher	78

General Information	Per Cent
less than 450	4
450-499	14
500-549	24
550 and higher	58

Science	
less than 450	5
450-499	16
500-549	28
550 and higher	51

March 18, 1965

UNIVERSITY OF MINNESOTA
MEDICAL SCHOOL ADMISSION STATISTICS
Freshman Medical Class Entering Fall 1965

Number of applicants for classes entering:

1958	1959	1960	1961	1962	1963	1964	1965
282	319	337	392	504	612	689	798

1965 Applicants	Number	Per Cent
Non-residents	465	58
Residents	333	42
Male	729	91
Female	69	9

Applicants offered positions in 1965 class		185
Declined or withdrew through 3/18/65		32
Non-residents	17	
Residents	15	
Freshman class for 1965, as of 3/18/65		153

ENTERING CLASS (153) STATISTICS:

	Number	Per Cent
Male	145	95
Female	8	5

	Number	Per Cent
Resident	139	91
Non-residents	14	9
Surrounding states	9	

Premedical education:

	Number	Per Cent
University of Minnesota	93	60
Minnesota State Colleges	(5)*	
Minnesota Junior Colleges	(3)*	
Minnesota Private Colleges	35	23
Colleges in surrounding states	6	4
Eastern schools	12	8
Other	7	5
Four years of college	91	60

*Attended for one or two years only

Total Grade Point Average:

less than 2.6	3%
2.6-3.0	29%
3.1-3.5	42%
3.6 and higher	26%
Range	2.2-4.0
Mean GPA	3.25

Medical College Admission Test Scores:

Verbal Ability	Per Cent	General Information	Per Cent
less than 450	18	less than 450	6
450-499	20	450-499	10
500-549	21	500-549	30
550 and higher	41	550 and higher	54

Quantitative Ability		Science	
less than 450	6	less than 450	2
450-499	11	450-499	7
500-549	29	500-549	25
550 and higher	54	550 and higher	66

March 16, 1964

UNIVERSITY OF MINNESOTA
MEDICAL SCHOOL ADMISSION STATISTICS
For Class Entering Fall 1964

Number of applicants for classes entering:	1958	1959	1960	1961	1962	1963	1964
	282	319	337	392	504	612	689

Applicants offered positions in 1964 class		181
Declined or withdrawn thru 3/16/64		29
Non-residents	15	
Residents	14	
Freshman class for 1964, as of 3/16/64		152

ENTERING CLASS (152) STATISTICS:

		Per Cent			Per Cent
Male	139	91	Residents	132	87
Female	13	9	Non-residents	20	13

Premedical education:		Per Cent
University of Minnesota		50
Other Minnesota Colleges		32
State and Junior Colleges	5	
Private Colleges	27	
Schools in surrounding states		5
Eastern schools		7
Other		6
Four years of college		69

Total Grade Point Average:	
Range	2.18-4.00
-2.6	7%
2.6-3.0	32%
3.1-3.5	43%
3.6 & over	18%

Medical College Admission Test Scores:

Verbal Ability		General Information	
less than 450	16%	less than 450	7%
450-499	18%	450-499	16%
500-549	23%	500-549	21%
550 and over	43%	550 and over	56%

Quantitative Ability		Science	
less than 450	1%	less than 450	3%
450-499	3%	450-499	9%
500-549	21%	500-549	21%
550 and over	75%	550 and over	67%

Part I I Faculty

MEDICAL SCHOOL FACULTY AT HEALTH SCIENCES CENTER

	Total Faculty 1968	Total Faculty 1977*
Anatomy	16.0	31.8[1]
Biochemistry	11.5	19.6[1]
Microbiology	12.5	18.0[1]
Pathology	10.0	18.3[1]
Pharmacology	12.5	16.5[1]
Physiology	17.1	19.5[1]
	79.6	123.7
Anesthesiology	7.0	10.0[2]
Dermatology	1.7	5.0[2]
Family Practice and Community Health	3.0	10.0[2]
Internal Medicine	39.0	42.0[2]
Laboratory Medicine	32.0	45.0[2]
Neurology	27.0	30.0[2]
Neurosurgery	7.0	5.0[2]
Obstetrics - Gynecology	5.5	10.0[2]
Orthopedic Surgery	5.5	4.5[2]
Ophthalmology	5.5	10.0[2]
Otolaryngology	5.0	10.0[2]
Pediatrics	47.0	44.0[2]
Physical Medicine and Rehabilitation	38.0	45.0[2]
Psychiatry	29.0	43.0[2]
Radiology	16.0	26.0[2]
Surgery	14.0	22.0[2]
Urology	2.0	4.5[2]
	284.2	366.0

1. Projections made in 1968, based upon proposed increase of class size to 200 and the old, 1968-69 curriculum.

2. Projections made in 1966, based upon proposed increase in class size to 200 and the 1966-67 curriculum.

* These faculty projections are tentative and subject to revision. It is imprudent to make firmer projections of faculty staffing for 1977 at this time for the following reasons.

A. The very recent legislative approval for capital funds for this current project, the resultant early NIH site visit, and the recent approval of a new curriculum have not provided enough time to establish the disposition of the departmental teaching loads, appropriate to the new curriculum, within the Health Sciences Center and between the University Hospitals and affiliated hospitals.

(continued)

B. A bond referendum regarding the future facilities of a major affiliated hospital, Hennepin County General Hospital, will be held on September 9, 1969. The results of this vote will alter the concentrations of Medical Students at the University and affiliated hospitals.

C. The addition of new programs, including the Department of Family Practice and Community Health, may alter these projections.

D. The rate at which the new curriculum will be implemented may affect departmental staffing patterns. At this time of earliest experience with the new curriculum, plans regarding implementation are just being formulated.

It is the intention of the Medical School to provide firmer faculty projection to the National Institutes of Health by October 1, 1969, in time for the December Council Meeting.

Other Teaching Reponsibilities

Types and numbers of students, other than Mecical students, to be taught in the facility by Medical School faculty -

Dental Students	560 - 600
Graduate Students	600
Veterinary Medical Students	
Pharmacy Students	400
Nursing Students	185
Medical Technologists	250
Occupational Therapists	80
Physical Therapists	90
Xray Technologists	
Arts College and other students	

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Dr. Gaylord W. Anderson, Director, School of Public Health

Gaylord W. Anderson, Mayo Professor and Director. Born in Minneapolis, December 31, 1901. A.B. Dartmouth, 1922. Studied at Sorbonne, Paris, 1922-23, University of Zurich, 1923. Assistant in Chemistry, Harvard 1923-24. M.D., Harvard, 1928; Dr. Public Health, 1942. Intern, Albany (N.Y.) Hospital, 1928-29; Epidemiologist, Massachusetts Department of Public Health 1929-30; Assistant Director, Division of Communicable Diseases, 1930-31; Director and Deputy Commissioner of Public Health 1931-37. Teaching Assistant in Public Health Administration, Harvard School of Public Health, 1931-37; Executive Secretary, Massachusetts Legislative Commission on Public Health Laws and Practices, 1935-37; Head, Department of Preventive Medicine and Public Health, Medical School, University of Minnesota, 1937-44; Director, School of Public Health, 1944-46; Mayo Professor and Director, School of Public Health, 1946-present. Major to Colonel, Medical Corps, U.S. Army, 1942-46, assigned to the Office of the Surgeon General, War Department; 1943-45 Director, Division of Medical Intelligence, decorated Legion of Merit; special consultant to Department of State in missions to Brazil, Argentina, Chile, Peru, 1948, Colombia, Ecuador, 1949, Chile 1950; Korea, 1954, for WHO to Egypt 1953, India, Iran, Egypt, 1958. Recipient Harrington Award, Minneapolis Junior Chamber of Commerce 1959; Sedgwick Memorial Award, American Public Health Association 1963; decorated by government of Peru with Order of Hipolito Unanue, rank of Commander 1967; Honorary Fellow, Royal Society of Health; member American Public Health Association (president 1952), American Epidemiological Society (president 1951), American College of Preventive Medicine, Massachusetts Medical Society, American Society for History of Medicine.

Representative publications:

Communicable Disease Control (with M. G. Arnstein and M. R. Lester) 4th Edition, 1962.

Global Epidemiology (with J. S. Simmons, T. F. Whayne and H. H. Horack) Vol. I, 1944; Vol. II, 1951, Vol. III, 1954.

Chapter on Epidemiology in Bacterial and Mycotic Infections of Man (edited by Dubos and Hirsch) 1965.

Poliomyelitis Occurring after Antigen Injections. Pediatrics 7:741-59 (June) 1951.

Public Health - A Mandate from the People. American Journal of Public Health 42:1367-73 (Nov.) 1952. Presidential Address to American Public Health Association.

John A. Anderson, M.D., Ph.D.

BIRTHDATE: October 28, 1908 BIRTHPLACE: Sioux Falls, South Dakota

EDUCATION:

Degree	Year	Institution	Major
		Washington High School, Sioux Falls, S.D.	
	1926-1928	University of South Dakota	
B.S.	1930	University of Minnesota, Minneapolis	
M.B.	1933	University of Minnesota, Minneapolis	
M.D.	1934	University of Minnesota, Minneapolis	Medicine
Ph.D.	1940	University of Minnesota, Minneapolis	Physiology & Pediatrics

HONORS AND AWARDS: Sigma Xi, Phi Kappa Phi (Scholastic)

FRATERNITIES: Delta Chi, Phi Chi

APPOINTMENTS:

1933 (3 mo.)	Internship: Dept. of Obstetrics, Mpls. General Hospital and University of Minnesota
1933-34	Department of Pediatrics, University of Minnesota
1934-35	Residency: Department of Pediatrics, University of Minnesota
1935-37	Child Research Council, Denver, Colorado
1937-43	Instructor and Assistant Professor, Department of Pediatrics, University of Minnesota
1943-49	Professor and Head, Department of Pediatrics, U. of Utah
1949-55	Department of Pediatrics, Stanford U.
1955-date	Department of Pediatrics, U. of Minnesota

BIBLIOGRAPHY

"Atypical phenylketonuric heterozygote," (with Doeden, D., Fisch, R.O., and Miller, E.O.). Journal of Pediatrics, 68:351-360, March, 1966.

"Prenatal and postnatal developmental consequences of maternal phenylketonuria," (with Fisch, R.O., and Walker, W.A.). Pediatrics. 37:979-986, June, 1966.

"L-tryptophan metabolism in phenylketonuria," (with Yarbro, M.T.). Journal of Pediatrics, 68:895-904, June, 1966.

"Failure to detect subtle neurotropism of live, attenuated measles virus vaccine," (with Halberg, F., Jones, F., St. Geme, J.W., Jr., Wright, F.S.). Journal of Pediatrics, 70:36-45, January, 1967.

"Tryptophan Oxidation in Phenylketonuria," (with Bruhl, H., Doeden, D., Michaels, A.J.). Pediatric Research, 1:372-385, 1967.

"The effect of excess L-phenylalanine on mothers and their breast-fed infants," (with Doeden, D., Fisch, R.O., and Jenness, R.). The Journal of Pediatrics, 71:2:176-180, August 1967.

"Circidan Rhytm in serum 5-hydroxytryptamine of healthy men and patients with mental retardation," (with Halberg, F.). International Journal of Neuropsychiatry, 3:4:379-386, 1967.

WALLACE D. ARMSTRONG, Head Department of Biochemistry

B.A., Univ. of Texas (1926); Sc.M., New York Univ. (1928); Ph.D., Univ. of Minn. (1932); M.D., Univ. of Minn. (1937).

Academic positions, Univ. of Minn.: Assistant, 1929-32; Instructor, 1932-37; Assist. Prof., 1937-40; Assoc. Prof., 1940-43; Prof., 1943-46; Professor and Head, 1946-present.

Professional Organizations: Am. Soc. Biological Chemists; Soc. Exp. Biol. and Medicine; Am. Physiological Soc.; Inter. Assoc. Dent. Res. (President 1945-46); Biochem. Soc. (London); Am. College of Dentists (Hon.). Am. Dentist Soc., Dental Soc. Sweden (Hon.).

Honors and Scientific Awards: Doctor of Odontology (Honoris Causa), Karolinska Institutet, 1955, Biological Mineralization Award (1966) and H. T. Dean Award (1967) - Int. Assoc. Dent. Res.; Commonwealth Fund Fellowships (Denmark and England - 1937-38), Sweden (1960).

Research Interests: Biochemistry and physiology of calcified tissues; Fluoride physiology and analysis; Mineral Metabolism.

Bibliography: Fetal and neonatal fluoride uptake by calcified tissues of rats, Itzhak Gedalia, Leon Singer, James J. Vogel and Wallace D. Armstrong, Israel Journal of Medical Sciences, 3, 726-730 (1967); Skeletal Magnesium changes in the rat during varying dietary fluoride intake and growth J. J. Vogel, Leon Singer and W. D. Armstrong, Journ. of Nutrition, 93, no. 4, 425-428 (1967); Determination of Fluoride in Bone with the Fluoride Electrode, Leon Singer and W. D. Armstrong, Analytical Chemistry, 40, 613 (1968); The Incorporation and Removal of Large Amounts of Strontium by Physiologic Mechanisms in Mineralized Tissues of the Rat, A. R. Johnson, W. D. Armstrong and Leon Singer, Calc. Tissue Res., 2, 242-252 (1968); Nature and Origin of the Plaque Produced in Cutaneous Calciphylaxis, Dick R. Lavender, Leon Singer, and W. D. Armstrong, Journal of Dental Research, 47, 907, (1968).

A.B. Baker, M.D.

Birth: March 27, 1908, Minneapolis, Minnesota

Educational History:

University of Minnesota	B.A.	1928
University of Minnesota	B.S.	1929
University of Minnesota	M.B.	1930
University of Minnesota	M.D.	1931
University of Minnesota	Ph.D.	1934

Other Training and Experience:

Robert Pack Hospital, Pennsylvania Internship 1930-1931

Honors:

Undergraduate	Graduate
Phi Beta Kappa	Sigma Xi
Alpha Omega Alpha	

Professional Organizations:

National Committee for Research in Neurological Disorders - Chairman
Multiple Sclerosis Society - Member Advisory Board
Epilepsy Foundation - Medical Advisory Board - Chairman
American Board of Psychiatry and Neurology
American Neurological Association
American Academy of Neurology

Post-doctorate Honors and Awards:

Membership	1959	Norwegian Academy of Science
Honorary Membership	1961	Argentine Neur. Society
Honorary Membership	1961	Chilean Neur. Society

Research Interests:

Cerebrovascular Disease; Atherosclerosis; Epilepsy

Selected Bibliography:

CLINICAL NEUROLOGY, 4 Volumes, Editor, Paul B. Hoeber, Inc., 2nd edition., 1962.

The Geographic Pathology of Atherosclerosis: With Personal Observations on Cerebral Atherosclerosis, Medical Bulletin of the University of Minnesota, 38:212, March, 1967.

A comparative Study of Cerebral Atherosclerosis in a Japanese and Minnesota Population, Journal of Atherosclerosis Research, 7:687, 1967.

Age and Cerebral Atherosclerosis, Journal of Neurological Sciences, 6:357-372, 1968.

A Study of a Caucasian and Oriental Population, Geriatrics, (in press).

ELLIS STARBRANCH BENSON, M. D.

Born: October 28, 1919

Education: Augustana College, Rock Island, Illinois, B.A., 1941
University of Minnesota Medical School, M.D., 1945

Graduate Medical Training:

Residency in pathology and internal medicine, Veterans Administration Hospital, Minneapolis, 1947-49.

Graduate School, University of Minnesota, 1947-53, pathology and biochemistry.

Postdoctoral fellowship, biochemistry (with Prof. K. Linderstrøm-Lang), Carlsberg Laboratory, Copenhagen, 1957-58.

Positions Held:

Instructor, Assistant Professor, Associate Professor - Laboratory Medicine, University of Minnesota, 1949-62.

Professor, Laboratory Medicine and Biochemistry, 1962---.

Head, Laboratory Medicine, 1966---.

Outside Positions and Consultations:

Member, Pathology "A" Study Section, NIH, 1964-68.

Member, Pathology Training Grant Committee, NIGMS, 1968-71.

President. Academic Clinical Laboratory Physicians and Scientists (ACLPS), 1966-68.

Bibliography:

Benson, E. S., Hallaway, B.E. and Lumry, R.W.: Deuterium-Hydrogen Exchange Analysis of pH-Dependent Transitions in Bovine Plasma Albumin. J. Biol. Chem. 239L;22, 1964.

Ward, P.C.J., Edwards, C. and Benson, E.S.: Relation Between Adenosinetriphosphate Activity and Sarcomere Length in Stretched Glycertol-Extracted Frog Skeletal Muscle. Proc. Nat'l. Acad. Sci. 53:1377, 1965.

Benson, E.S., Freier, E.F. and Vijums, R.: Carbon Dioxide Dissociation Curve and Buffer Capacity of Dog Heart Muscle. Am. J. Physiol. 209:941, 1965.

Benson, R.W., Dempsey, M.E. and Benson, E.S.: Kinetic Relationships Between Phosphate-Oxygen Exchange and Hydrolytic Cleavage of Adenosine Triphosphate Catalyzed by Myofibrils. Jour. Biol. Chem. 242:7, 1967.

Staley, N. A. and Benson, E. S.: The Ultrastructure of Frog Ventricular Cardiac Muscle and its Relationship to Mechanisms of Excitation-Contraction Coupling. Jour. Cell Biol., 38:99, 1969.

H. Mead Cavert, M.D.

DATE OF BIRTH: March 30, 1922
PRESENT POSITION: Professor of Physiology and Associate Dean and Executive Officer of the University of Minnesota Medical School

EDUCATION:
1942 B.S., Agricultural Biochemistry, University of Minnesota
1951 M.D., University of Minnesota
1952 Ph.D., Physiology, University of Minnesota

PROFESSIONAL EXPERIENCE:
1946 Research Assistant, Department of Physiology, University of Minnesota
1950-51 Teaching Assistant, Department of Physiology, University of Minnesota
1951-54 Research Fellow, American Heart Association
1954-57 Established Investigator, American Heart Association
1953-59 Assistant Professor, Department of Physiology, University of Minnesota
1957-64 Assistant Dean, College of Medical Sciences, University of Minnesota
1959-68 Associate Professor, Department of Physiology, University of Minnesota
1968- Professor, Departmentof Physiology, University of Minnesota
1961-62 National Heart Institute Special Research Fellow and Visiting Professor, University of Edinburgh, Scotland (Sabbatical Leave).
1964- Associate Dean, Medical School, University of Minnesota
1966-69 Member, Program Project Committee B, National Heart Institute.
1964- Member, Group on Student Affairs; 1964-68, Committee on Student Aspects of International Aspects of Medical Education, Association of American Medical Colleges, Chairman, SAIME 1967-68. Member, Committee on International Relations in Medical Education, AAMC, 1968-.

MAJOR RESEARCH INTERESTS: Physiology; skeletal and cardiac muscle; transmembrane transport of cellular constituents.

PUBLICATIONS:
1) Bihler, I., H.M. Cavert, and R.B. Fisher, J. Physiol. 180:157, 1965. "The uptake of pentoses by the perfused isolated rabbit heart."
2) Bihler, I., H.M. Cavert, and R.B. Fisher. J. Physiol. 180:168, 1965. "A differential effect of inhibitors on sugar penetration into the isolated rabbit heart." (J. Physiol. 169:22, 1963. Abstract of above paper for presentation to the Physiological Society (British), Edinburgh, July 12, 1963.)
3) Co-author, "Machinery of the Body," 5th Edition, University of Chicago Press, 1961, with A.J. Carlson and Victor Johnson.
4) Thompson, A.M., H.M. Cavert, N. Lifson, and R.L. Evans. "Regional tissue uptake of D_2O in perfused organs: Rat liver, dog heart and gastrocnemius." American Journal of Physiology, 197:897, 1959.
5) Cavert, H.M., "Some current views on the biochemistry and physiology of myocardial contraction," Bulletin New York Academy of Medicine. 34:445, 1958.

RECENT ABSTRACTS:

Cronau, L.H., Jr., H.M. Cavert, and C. Quello. Federation Proceedings 26: 258, 1967. "Repetitive contraction and uptake of D-Xylose in isolated perfused rat diaphragm."

Wermers, G.W., H.M. Cavert, C. Quello and L.H. Rusin. Federation Proceedings 28:462, 1969. "The effect of repetitive contraction on accumulation of amino acids in isolated perfused rat diaphragm."

James R. Dawson, Jr., M.D.

BIRTH: January 19, 1908, Birmingham, Alabama

Married, 6 children

EDUCATION: B.A. Degree, Vanderbilt University, 1928
M.D. Degree, Vanderbilt University, 1931
Residency Training-Vanderbilt Hospital and Medical School, 31-34

POSITIONS HELD:

Assistant in Pathology & Bacteriology-Rockefeller Institute for Medical Research, 1934-35
Instructor of Bacteriology and Immunology-Cornell University School of Medicine, 1935-38
Assistant Professor, Associate Professor and Professor of Pathology, Vanderbilt University School of Medicine, 1935-38
Professor and Head, Department of Pathology, University of Minnesota School of Medicine, 1949 - present

PROFESSIONAL ORGANIZATIONS:

American Association for the Advancement of Science
American Association of Pathologists and Bacteriologists
American Society for Experimental Pathology
Twin City Society of Pathologists

BIBLIOGRAPHY

Cellular inclusions in cerebral lesions of lethargic encephalitis. Am. J. Path. 1933, 9:7-16.

Herpetic infection of the chorio-allantoic membrane of the chick embryo. Am. J. Path. 1933, 9:1-6.

Early diagnosis of rabies by mouse inoculation. Measurement of humoral immunity to rabies by mouse protection test. Proc. Soc. Exp. Biol. & Med. 1935, 32:57-573.

Infection of chicks and chick embros with rabies. Science, 1939, 89, 300.

A study of chick-embryo-adapted rabies virus. Am. J. Path. 1941, 17, 177.

Richard V. Ebert, M.D.

BIRTH: October 25, 1912, St. Paul, Minnesota
UNDERGRADUATE WORK: University of Chicago, B.S., 1933
MEDICAL SCHOOL: University of Chicago Medical School, M.D., 1937
INTERNSHIP: Boston City Hospital, 2nd Medical Service, 1937-1939
RESIDENCY: Peter Bent Brigham Hospital, Assistant Resident, 1939-1941
ACADEMIC POSITIONS:

Research Fellow, Harvard Medical School, 1940-1942
Associate Professor of Medicine, University of Minnesota, 1946-1949
Professor of Medicine, University of Minnesota, 1949-1952
George S. Clark Professor of Medicine, University of Minnesota, 1952-1953
Professor and Head, Department of Medicine, University of Arkansas Medical Center, September 1954 to June 1, 1966
Professor and Head, Department of Medicine, University of Minnesota, June 1, 1966 to present

POSITIONS OTHER THAN ACADEMIC:

Junior Associate in Medicine, Peter Bent Brigham Hospital, 1941-1946
Chief, Medical Service, Veterans Administration Hospital, Minneapolis 1946-1952
Chief, Medical Service, Veterans Administration Research Hospital, Chicago, 1953-54

CERTIFIED: American Board of Internal Medicine, 1944

HONORS RECEIVED: Phi Beta Kappa; Alpha Omega Alpha; Brone Star Medal

BIBLIOGRAPHY

Fry, D.L., Ebert, R.V., Stead, W.W. and Brown, C.C., Jr.: The Mechanics of pulmonary ventilation in normal subjects and in patients with emphysema. Am. J. Of Med. XVI, No. 1, 80, January 1954.

Pierce, J.A. and Ebert, R.V.: The barrel deformity of the chest, the senile lung and obstructive pulmonary emphysema. Amer. J. Med. 25:13, July 1958.

Pierce, John A., Hocott, Joe B. and Ebert, Richard V.: The collagen and elastin content of the lung in emphysema. Ann. Int. Med. 55:210, August, 61.

Pierce, John A. and Ebert, Richard V.: The fibrous network of the lung and its change with age. Thorax, 20:469-476, September, 1965.

Cooperative Study: Long-Term Anticoagulant Therapy After Myocardial Infarction. J.A.M.A., 193:929-934, 1965.

Ebert, Richard V.: Chronic Bronchitis & Pulmonary Emphysema. In: Beeson, P.B. and McDermott, W. Ed. Cecil-Loeb Textbook of Medicine, 11th Ed. Philadelphia, Saunders, 1963 pp. 532-538.

CONCERNING: Elwin E. Fraley, M.D.

Name: Elwin E. Fraley, M.D.

Born: May 3, 1934

Marital Status: Married, 6 children

Current Status: Senior Investigator, Surgery Brach, National Cancer Institute, National Institutes of Health, Bethesda, Md. CMPR, USPHS.

Future Status: Professor and Chairman, Department of Urology, University of Minnesota School of Medicine, Minneapolis, Minnesota 55455

Education:	Phillips Exeter Academy	1951 - 1953
	Princeton University	1953 - 1957 A.B. (cum laude)
	Harvard Medical School	1957 - 1961 M.D. (cum laude)

Training & Experience:

1961 - 1962	Internship, Surgery, Massachusetts General Hospital, Boston, Massachusetts
1962 - 1963	Third Assistant Resident in Surgery, Massachusetts General Hospital, Boston, Massachusetts
1963 - 1964	Junior Assistant Resident in Urology, Massachusetts General Hospital, Boston, Massachusetts
1964 - 1965	Senior Assistant Resident in Urology, Massachusetts General Hospital, Boston, Massachusetts
1965 - 1966	Resident in Urology, Massachusetts General Hospital, Boston, Massachusetts
1966 - 1967	Assistant in Urology, Massachusetts General Hospital; Instructor in Surgery, Harvard Medical School, Boston, Massachusetts

Research Experience:

3 years of independent research:
1 year at the Massachusetts General Hospital
2 years as Senior Investigator in the Surgery

Other: Diplomate of National Board of Medicine
Licensed physician, Commonwealth of Massachusetts, 1963
Clinical Research Fellow, American Cancer Society, 1964-1966
Researcher, John Hartford Foundation, Inc., 1966-1968
Clinical Research Prize, American Urological Association, 1964
Soma Weiss Award, Harvard Medical School, 1963
First Prize, New England Section, American Urological Association Essay Contest, 1966
First Prize, American Urological Association Clinical Research Essay Contest, 1967
First Prize, American Urological Association Laboratory Research Essay Contest, 1968

Societies: Associate Member, Mid-Atlantic Section of the American Urological Association, Inc.
Washington Urological Society
American Nephrology Society
Sigma XI
AOA
Visiting Professor of Urology, University of Mississippi Medical Center, 1968

SELECTED BIBLIOGRAPHY
for
Elwin E. Fraley, M.D.

1. Fraley, E. E. and Paulson, D. F.: Morphological and Biochemical Studies of SV40 Tranformed Prostatic Tissue. J. Urol.

2. Fraley, E. E. and Paulson, D. F.: The Effect of Estrogen, Testosterone and Combined Estrogen-Testosterone Therapy on the Growth of Virus (SV40) Induced Prostatic Tumors. Surgical Forum XIX: 544:545, 1968.

3. Paulson, D. F., Marshall, J. F. and Fraley, E. E.: A New and Simplified Method for Cystoscopic Photography. J. Urol.

4. Doppman, J. F., and Fraley, E. E.: Angiographic Techniques in the Syndrome of Vascular Obstruction of the Superior Infundibulum. Radiology 91: 1039 - 1041, 1968.

5. Fraley, E. E. and Paulson, D. F.: Virus-Induced Tumors of the Hamster Prostate. A Model for Human Carcinoma of the Prostate. Bull. Path. 9: 235, 1968.

6. Harbert, J. and Fraley, E. E.: Scintillation Camera Renography in Superior Infundibular Obstruction. J. Am. Med. Assoc.

7. Fraley, E. E. and Paulson, D. F.: Classes of Cytoplasmic RNA and Poly-Ribosomes in Tissues Transformed by DNA Oncogenic Viruses: SV40 Transformed Hamster Prostatic Tissue. Cancer Research.

8. & 9. Fraley, E. E. and Paulson, D. F.: Urologic Surgery in Medical Progress. New Eng. J. Med.

10. Deckers, P. B., Fraley, E. E., Harbert, J., Doppman, J. and Paulson, D. F.: Vascular Obstruction of the Superior Infundibulum Causing Nephralagia in Shildren. Surgery.

11. Paulson, D. F. and Fraley, E. E.: The Macromolecular Pathology of the Acutely Obstructed Kidney, J. Urol.

Lyle Albert French, M.D.

COLLEGES AND UNIVERSITIES ATTENDED: Macalester College, St. Paul 1933-35
University of Minn., Mpls. 1935-47

INTERNSHIP: University of Minnesota, Minneapolis, Minnesota 1939-40

RESIDENCY: University of Minnesota, Minneapolis, Minnesota 1940-47

SOCIETIES AND DATE JOINED:

American Academy of Neurological Surgery	1954
Harvey Cushing Society	1952
Minneapolis Academy of Medicine (President 60-61)	1952
Minnesota Society of Neurological Sciences (President 64)	1948
Neurosurgical Society of America (President 57-58)	1948
Society of Neurological Surgeons	1955
Society of University Surgeons	1955

STAFF POSITIONS AND DATE:

Consultant and Acting Chief of Neurosurgery, Veterans Administration Hospital, Minneapolis, Minn. 1948 to present
Chief of Staff, University Hospitals, University of Minnesota 1968-
Professor and Head, Department of Neurosurgery, University of Minnesota, July, 1960 to present

DEGREES: B.S.- 1936, M.B.- 1939, M.D.- 1940
M.S. in Neurosurgery -46 (thesis title: Injuries to Peripheral Nerves)
Ph.D. in Neurosurgery -47 (thesis title: Brain Tumors in Children)

ADVISORY POSITIONS: Consultant in Neurosurgery, U.S. Army, 1963
Special Consultant, V.A., Neurosurgery, 1968-
Member, American Board of Neurological Surgery, 62-68
Member, Advisory Committee, National Paraplegia Foundation
Member, NIH, Training Grants Program

BIBLIOGRAPHY

French, L.A. and Galicich, J.H.: The Use of Steroids for the Control of Cerebral Edema, Clinical Neurosurgery, 10:212-223, 1962.

French, L.A., Chou, S.N. and Story, J.L.: Cerebrovascular Malformations. Clinical Neurosurgery, 14:171-182, 1964.

French, L.A.: The Use of Steroids in the Treatment of Cerebral Edema. Bull, N.Y. Acad. Medicine, 42:4, 301-311, 1966.

French, L.A., Chou, S.N., Story, J.L. and Schultz, E.A.: Aneurysms of the Anterior Communicating Artery, J. Neurosurg., 24:693-696, 1966

French, L.A. and Chous, S.M.: Conventional Methods of Treating Intracranial Arteriovenous Malformations, Progress in Neurological Surg. Volume 3, Karger, Basel/New York, 1967.

Benjamin F. Fuller, M.D.

BIRTH: St. Paul, Minnesota, August 7, 1922
EDUCATION: B.A., Minnesota, 1942; B.S., Minnesota, 1943
M.D., Minnesota, 1945; M.S., Minnesota, 1950
Internship, U. of Minnesota (Internal Medicine). Mpls., 1946
Fellowship, Mayo Foundation, Internal Medicine, 1947-1950
POSITIONS HELD: Private Practice - St. Paul, Minnesota, 1951-1965
Clinical Instructor, Minnesota, Department of Internal Medicine, 1951-1953
Clinical Assistant Professor, Minnesota, Department of Internal Medicaine, 1954-65
Assistant Professor, Minnesota, Department of Internal Medicine, 1966-67
Associate Professor, Minnesota, Department of Internal Medicine, 1967-68
Director, Medical Clinics, Minnesota, 1966-68
Medical Consultant, Vascular Disease, Minn., 1951-1968
Executive Secretary, Division of Family Practice and Community Health, 1967-1968
Director, Division of Family Practice and Community Health, 1968-69
Professor and Chairman, Department of Family Practice and Community Health, 1969-
PROFESSIONAL ORGANIZATIONS: Ramsey County Medical Society, Minnesota State Medical Assoc., American Medical Assoc., Fellow, American College of Physicians, Fellow, American College of Angiology
OFFICES HELD: Medical Policy Board, Charles T. Miller Hospital, St. Paul, 1964-1965
President, St. Paul Society of Internal Medicine, 1963-64
President, Association of Minnesota Internists, 1957
Executive Committee, Association of Minnesota Internists, 1958-1967
MILITARY SERVICE: Capt., M.C., USAF, Instructor, Dept. of Internal Medicine, School of Aviation Medicine, Randolph Field, Texas, 1946-47; Capt., M.D., USAF, Chief of Medicine, Scott Air Force Base, Illinois, 1953.
HONORS: Alpha Omega Alpha, Honorary Medical Fraternity, Society of the Sigma Xi
PROFESSIONAL CERTIFICATION: American Board of Internal Medicine, 1954

BIBLIOGRAPHY

The Diabetic Foot, Fuller, B.F., Minnesota Medicine, April 1957.

Chapter on Peripheral Vascular Disease. Fuller, B.F., Outlines of Internal Medicine, Edited by C.J. Watson, Eighth, Ninth, and Tenth editions.

The Present Status of Thrombolytic Agents, Fuller, B.F., Minnesota Medicine, 46:465, May 1963.

Quality and Quantity in Medical Education and Patient Care, Medical Bulletin, University of Minnesota, May 1966.

Can We Get There From Here? Journal Medical Education. November 1968.

CURRICULUM VITAE

Eugene Grim, Born July 19, 1922, Stillwater, Oklahoma.
Married, one child.

Education

Kansas State University, B. S. Chemistry, 1945
Kansas State University, M. S. Biochemistry, 1946
University of Minnesota, Ph.D. Physiological Chemistry, 1950

Employment

Aeronautical Engineer, Missouri and Connecticut, 1941-43
Teaching Assistant, University of Minnesota, 1945-47
Pre-doctorate Fellow, National Institutes of Health, 1947-50
Post-doctorate Fellow, University of Minnesota, 1951-52
Instructor, Physiology, University of Minnesota, 1952-54
Assistant Professor, Physiology, University of Minnesota, 1954-58
Associate Professor, Physiology, University of Minnesota, 1958-62
Professor, Physiology, University of Minnesota, 1962-68
Professor and Head, Physiology, University of Minnesota, 1968 -

Other Current Occupations

Deputy Section Editor - American Journal of Physiology and Journal of Applied Physiology
Chairman - NIH Study Section for Physiology

Research Interests

Transport processes, especially those associated with the gastro-intestinal and cardiovascular systems.

Selected Bibliography

Grim, E., J. Lee, and M. Visscher. "Water exchange between intestinal contents, tissues and blood", Amer. J. Physiol. 182:359 (1955).

Grim, E. and K. Sollner, "Contributions of normal and anomalous osmosis to the osmotic effects arising across charged membranes with solutions of electrolytes", J. Gen. Physiol. 40:887 (1957).

Grim, E., "The flow of blood in the mesenteric vessels" in Handbook of Physiology. Sect. 2, Vol. II, P. 1439 (1963).

Grim, E., "A mechanism for absorption of sodium chloride solutions from the canine gallbladder", Am. J. Physiol., 205: 247 (1963).

Delaney, J. and E. Grim., "Canine gastric blood flow and its distribution", Am. J. Physiol. 207: 1195 (1964).

NAME: John E. Harris, Ph.D., M.D.

BIRTHDATE: December 27, 1913 PLACE OF BIRTH: Toledo, Ohio

EDUCATION: University of Toledo, Toledo, Ohio, 1931-35, B.S., 1935
University of Iowa, 1936-40 Ph.D., Biochemistry, 1940
University of Oregon Medical School, 1946-50, M.D., 1950

SPECIAL TRAINING: Internship: Walter Reed Army Hospital, 1950-51
Residency: Ophthalmology at University of Oregon Medical School, 1951-54

PROFESSIONAL EXPERIENCE AND POSITIONS:

Research Associate	State University of Iowa	1940-41
Fellow, National Research Council	University of Pennsylvania	1941-42
Research Associate	University of Oregon	1946-50
Assistant Professor of Ophthalmology	University of Oregon	1951-54
Associate Professor of Ophthalmology	University of Oregon	1955-58
Professor and Head, Dept. of Ophthalmology	University of Minnesota	1959 to present

HONORS AND AWARDS:
Markle Scholar in Medical Science, 1951-56
First Friedenwald Memorial Award, June, 1957

RESEARCH INTERESTS:
Biochemistry of lens and cornea
Natural history of diabetic retinopathy
Human corneal diseases and their treatment
Pharmacology as related to ocular structures

BIBLIOGRAPHY:
Harris, J.E.: The physiologic control of corneal hydration: The first Jonas S. Friedenwald Memorial Lecture. Am. J. Ophthal. 44:262-280, 1957

Harris, J.E. and Gruber, L.: The electrolyte and water balance of the lens. Exp. Eye Res. 1:372-384, 1962

Harris, J.E.: Current thoughts on the maintenance of corneal hydration in vivo. Arch. Ophthal. 78:126-132, 1967

Harris, J.E.: The temperature reversible cation shift of the lens. Trans. Am. Ophthal. Soc. 64:675-699, 1966

Harris, J.E., Gruber, L.: The reversal of triparanol induced cataracts in the rat. Documentia Ophthal. In Press

Hausman, William

Born 7-25-25 Brooklyn, New York

Medical School: Washington University, M.D., 1947
Internship: Coney Island Hospital, Brooklyn, 1947-48

Residency: Worcester State Hospital, 1948-49
Institute of Pennsylvania Hospital, 1949-50 and 1951-52

Licensed: Missouri and Maryland

Certified: Psychiatry ABP&N; Fellow APA

Professional Experience

Division Psychiatrist, 24th Infantry Division, Korea 1950-51

Asst. Chief, P&N Section, Army Hospital, West Point, 1952-53
Chief, Medical Research Project and P&N Section, West Point, 1953-58

Chief, Consultation Service, Letterman General Hospital, 1958-61
Chief, Psychiatric Service, 1961-62

Chief, Behavioral Science Research Branch, Army Medical Research and Development Command, Office of the Surgeon General, 1962-65

Deputy Director, Division of P&N, Walter Reed Institute of Research, 1965-66

Associate Professor and Psychiatrist-in-Charge, Student Mental Health Service, Johns Hopkins, 1966 to date

Publications

Adaptation to West Point. U. S. Military Academy, 1959.

Psychiatric screening of West Point Candidates. U. S. Military Academy, 1960.

Who Comes to West Point? U. S. Military Academy, 1960.

Military Psychiatry. Archives General Psychiatry, 1967.

Robert B. Howard, M.D., Ph.D.

PERSONAL DATA: Born - December 25, 1920, St. Paul, Minnesota
EDUCATION: B.A. magna cum laude; June, 1942; M.B.-Aug. 1944; M.D.-June, 1945
Ph.D. (in Medicine) June, 1952, all at University of Minnesota
Ph.D. Thesis: "Studies on the Metabolism of Iron"
BOARD CERTIFICATION: American Board of Internal Medicine, April, 1951
ACADEMIC APPOINTMENTS: All at University of Minnesota
Teaching Fellow, Instructor, and Assistant Professor, Department of Internal Medicine, 1945-1953.
Associate Professor, Department of Internal Medicine, July, 1953, to June 30, 1958.
Director, Department of Continuation Medical Education, January, 1952, to September 30, 1957.
Associate Dean, College of Medical Sciences, October 1, 1957 to June 30, 1958.
Dean, College of Medical Sciences, July 1, 1958 to present
HONORARY SOCIETIES: Phi Beta Kappa, University of Minnesota, 1942.
Alpha Omega Alpha, University of Minnesota, 1944.
PUBLIC AND PROFESSIONAL SERVICE:
National: Member of Selection Committee for Senior Research Fellowships of the National Institutes of Health, 1959-63.
Member, National Advisory Research Resources Committee, NIH, 63-64. 1963-64.
Member, National Advisory Council on Health Research Facilities, 1964-68
Member, Surgeon General's Advisory Committee on Indian Health, 1961-65
Association of American Medical Colleges, Vice-President, 64-65, Treasurer, 1965-66, Secretary-Treasurer, 1966-68.
Chairman-elect, Association of American Medical Colleges, 68-69.
Member, Advisory Committee for General Research Support Grants, USPHS 1969-
Member, Commission on Education for the Health Professions, Nat'l. Association of State Universities and Land-Grant Colleges, 1966-present.
State: Member, Governor's Advisory Council on Health, Welfare and Rehabilitation, State of Minnesota, 1967-

SELECTED BIBLIOGRAPHY

1. The Relation of Infectious Hepatitis to Cirrhosis of the Liver, with Particular Reference to the Cholangiolitic Type (Hanot's Cirrhosis; So-Called Hypertrophic Biliary Cirrhosis). Tr. Assoc. Am. Phys., 59:166, 1946. (with C.J. Watson and F.W. Hoffbauer)
2. Studies on the Metabolism of Iron. Ph.D. Thesis, Univ. of Minn., June, 52.
3. Diurnal Rhythm of the S rum Iron Level: Effect of Diet and of Environmental Temperature. Proc. of Central Soc. for Clin. Res., 26:48, 1953.
4. 24-Hour Periodicity and Experimental Medicine: Examples and Interpretation Postgraduate Med., 24:349, Oct. 1958. (with F. Halberg)
5. The Educational Environment in the Large Medical School. J. Med. Educ. 42:633-641. July, 1967 (with Dr. Wm. N. Hubbard, Jr.)
6. Adapting Medical Education to Meet Increasing Manpower Requirements. Medical Manpower-A Continuing Crisis. Journal of The American Medical Association, 201:858-860, September, 1967.

CURRICULUM VITAE

FREDERIC J. KOTTKE, M.D., Ph.D., Professor and Head

Department of Physical Medicine and Rehabilitation
University of Minnesota Medical School
Minneapolis, Minnesota

Birthdate:

May 26, 1917

Academic Record:

High School Graduate - Windom, Minnesota - 1935
B.S., University of Minnesota - 1939
M.S. in Physiology; minor Pathology,
University of Minnesota - 1941
Ph.D. in Physiology; minor, Pathology
University of Minnesota - 1944
M.D., University of Minnesota - 1945
Baruch Fellow - Physical Medicine,
University of Minnesota - 1946-47

Professional Record:

Teaching Assistant Physiology,
University of Minnesota - 1939-40
Instructor, Physiology, University of Minnesota - 1941-44
Medical Licensure, Minnesota - 1947
Assistant Professor, Physical Medicine - 1947-49
Associate Professor, Physical Medicine - 1949-53
Director, Division of Physical Medicine - 1949-52
Head, Department of Physical Medicine and Rehabilitation - 1952
Professor, Physical Medicine and Rehabilitation - 1953
Diplomate, American Board of Physical Medicine
and Rehabilitation - 1949

Professional Memberships:

American Academy of Physical Medicine and Rehabilitation
American Congress of Physical Medicine and Rehabilitation
American Medical Association
American Association for the Advancement of Science
American Association of University Professors
American Museum of National History
American Physiological Society
Hennepin County Medical Society
International Society for Rehabilitation of the Disabled
Minnesota Academy of Science

Minnesota Heart Association
Minnesota Medical Alumni Association
Minnesota Medical Foundation
Minnesota State Medical Association
Minnesota Rehabilitation Association
National Geographic Society
New York Academy of Sciences
Sigma Xi
Society for Experimental Biology and Medicine
National Rehabilitation Association
Minnesota Society for the Prevention of Cruelty
Minnesota Citizens Committee on Health and Research
American Rehabilitation Foundation Expert Medical Committee

Appointments and Services:

Editorial Board, Modern Medicine, 1955
Editorial Board, Archives of Physical Medicine and Rehabilitation, 1957
American Congress of Physical Medicine and Rehabilitation
5th Vice President, 1954
4th Vice President, 1955
3rd Vice President, 1956
2nd Vice President, 1957
1st Vice President, 1958
President-elect, 1959
President, 1966
American Board of Physical Medicine and Rehabilitation
Member - 1955-69
President - 1963-69
Executive Committee, Third International Congress of Physical Medicine - 1960
Program Chairman, Third International Congress of Physical Medicine - 1960
Delegate, International Federation of Physical Medicine - 1964
President, Minnesota Examining Committee for Physical Therapists - 1951-60
Member, Minnesota Governor's Advisory Committee on Vocational Rehabilitation - 1956-60
Member, Medical Advisory Committee, Vocational Rehabilitation Administration - 1960-67
Member, Medical Advisory Committee, Social and Rehabilitation Service - 1968
Member, Medical Research Study Section, Vocational Rehabilitation Administration - 1961-63
American Medical Association Advisory Committee on Physical Therapy Education - 1957-59
American Medical Association Commission to Coordinate the Relationships of Medicine with the Allied Health Professions and Services - 1962-63

Medical and Scientific Committee, Minnesota Chapter, Arthritis and Rheumatism Foundation - 1960
Member, Board of Directors, Kenny Rehabilitation Foundation - 1960-64
Vice President - 1960-63
Secretary - 1964
Member, Board of Directors, American Rehabilitation Foundation - 1964
Secretary - 1964
Member, Residency Review Committee on Physical Medicine and Rehabilitation, American Medical Association - 1956-58, 1963
Member, Minnesota Legislative Interim Commission on Employment of the Physically Handicapped - 1957-59
Member, Minnesota State Board of Health - 1964-67
Consultant in Physical Medicine and Rehabilitation, Minneapolis Veterans Administration Hospital - 1956

Honors:

Distinguished Service Key, American Congress of Physical Medicine and Rehabilitation - 1961
Citation, President's Committee on Employment of the Physically Handicapped - 1959
John Stanley Coulter Memorial Lecture (XVIII), August 28, 1968

Selected Bibliography

Studies of cardiac output during the early phase of rehabilitation. Kottke, F.J., W.G. Kubicek, J.N. Danz, and M.E. Olson. Postgrad Med 23:533-544 (May) 1958.

Changes in the structure, innervation, electromyographic patterns and enzymes of skeletal muscle resulting from experimental treatment with triamcinolone. Awad, E.A., K.F. Swaiman, and F.J. Kottke. Arch Phys Med 46:297-306 (Apr) 1965.

Renal function in patients with spinal cord injuries. Price, M., J.A. Tobin, M. Reiser, M.E. Olson, W.G. Kubicek, F.J. Kottke, and J. Boen. Univ Minn Med Bull 36:302-304(Apr) 1965.

The effects of limitation of activity upon the human body. Kottke, F.J. JAMA 196:825-830 (June 6) 1966.

The rationale for prolonged stretching for correction of shortening of connective tissue. Kottke, F.J., D.L. Pauley, and R.A. Ptak. Arch Phys Med 47:345-352 (June) 1966.

Lazarow, Arnold, M.D., Ph.D.

BIRTHPLACE: Detroit, Michigan

EDUCATION: University of Chicago, Chicago, Ill. B.S., Biochemistry, 1937
University of Chicago, Chicago, Ill. M.D., 1941
University of Chicago, Chicago, Ill. Ph.D., Anatomy 1941

HONORS: Phi Beta Kappa
Alpha Omega Alpha
Sigma Xi
Joseph A. Capps Prize in Medicine, 1942

MAJOR RESEARCH: Experimental Diabetes, Cytochemistry, Information Retrieval

PROFESSIONAL EXPERIENCE:
Senior Instructor, Western Reserve University 1943-46
Assistant Professor of Anatomy, Western Reserve U. 1946-48
Associate Professor of Anatomy, Western Reserve U. 1948-54
Professor and Head, Department of Anatomy, U. of Minn. 1954-

ADVISORY POSITIONS:
Executive Committee, American Association of Anatomists, 1963-67
President, 1965-66 and Council member, 1952-55, Histochemical Society
National Institute of Arthritis and Metabolic Disease Council (USPHS) 1961-65
Study Section Metabolism and Nutrition, (USPHS) 1957-60
Cell Biology 1960-61
Council of American Diabetes Association 1956-62

EDITORIAL EXPERIENCE:
Editorial Board, Journal of Histo- and Cytochemistry 1960-62
DIABETES, Journal of American Diabetes Association, 1962-68
Chairman of Diabetes Abstract Literature Committee, American Diabetes Association 1957-64
Editor, Diabetes Literature Index 1966

RECENT PUBLICATIONS

Lazarow, A.: Glomerular basement membrane thickening in diabetes. Proceedings of the Sixth Congress of the International Diabetes Federation, Excerpta Medica Foundation, Amsterdam, 1969.

Abrahamson, D.E. and Lazarow, A: A computer-linked, two wavelength microspectrophotometer. Ann N.Y. Acad. Sci. 157:298, 1969.

Erlandsen, S.L., Wells, L.J., and Lazarow, A.: Organ culture of pancreases of fetuses from normal and diabetic rats: Effect of glucose on the insulin content of the media. Metabolism 17:638, 1968.

Lazarow, A.: Insulin sythesis, storage, release, transport and antagonism. Diabetes 15:281, 1966.

Lazarow, A.: Physical methods in quantitative histo- and cytochemistry. J. Histo Cyto 14:832, 1966.

Dr. Francis W. Lynch

BIRTH: June 21, 1906, Winona, Minnesota

EDUCATION: University of Minnesota, B.S. 1928; M.B. with distincition 1929; M.D. 1930; M.S. (Dermatology) 1933

SOCIETIES: Phi Rho Sigma Medical Fraternity (President of Theta Tau Alumni Chapter); Minnesota Medical Alumni Association (President); Alpha Omega Alpha, 1929; Sigma Xi

PROFESSIONAL EXPERIENCE:

Faculty, Medical School, University of Minnesota 1933-
Professor of Dermatology and Director of the Division of Dermatology, University of Minnesota, 1957-
Minnesota Medical Foundation 1950-58 (Vice President 1954)
Ancker Hospital (nos St. Paul Ramsey Hospital) Staff, 1934
- Chief of Dermatology 1955-57
- Chief of Staff 1957
- Honorary Consulting Staff 1958

St. Joseph's Hospital Staff
- Advisory Board 1954-60
- Chief of Staff 1959

PROFESSIONAL SOCIETIES:

Ramsey County Medical Society 1934 (President 1958)
Minnesota Medical Association 1934 (Second Vice President)
American Medical Association 1934 (Chairman of Section on Dermatology) 1952
Committee on Cutaneous Health and Cosmetics 1965-
Minnesota Dermatological Society, 1933 (Secretary; President)
Chicago Dermatological Society (President 1948)
Society for Investigative Dermatology
- Director; Vice President; Associate Editor of Journal for Investigative Dermatology

American Academy of Dermatology 1938; Director 1947-50 and 1959-62; Vice President, 1950; President 1960.
American Board of Dermatology 1951-60; Vice President 1957; President 1959; Advisor 1960-.
Association of Professor of Dermatology; Secretary 1962-63; President 1964.
American Dermatological Association 1939; Director 1958-62; President 1964.
St. John's Hospital Dermatological Society (Fellow 1954)
International Society Tropical Dermatology 1961-
Pacific Dermatological Association (Honorary Member 1956-)
Danish Dermatological Society 1961 (corresponding member)
American Cancer Society
- Minnesota Division; Director 1952-; 1st Vice President and Chairman of Executive Committee 1958
- Region 4 Chairman 1960
- Director (from Region 4) 1960-63

St. Paul Out-Patient Center (Director 1960-63)

HONORS: Distinguished Service Award from Archbishop of St. Paul, 1961.

PUBLICATIONS RELATED TO CANCER

Xeroderma Pigmentosum, Archives of Dermatology and Syphilogy, Vol. 29, p. 858-873, June 1934.

Cutaneous Lesions Associated with Monocyte Leukemia and Reticulo-endothelias, Archives of Dermatology and Syphilology, Vol. 34, p. 775-776, November 1936.

Carcinoma of the Breast with Peculiar Cutaneous Metastases, Archives of Dermatology and Syphilology, Vol. 35, p. 632-651, April, 1937.

Leukemia Cutis, Staff Meeting Bulletin, Hospital of University of Minnesota, Vol. IX, No. 19, March 4, 1938.

Steatocystoma Multiplex, Journal of Investigative Dermatology, Vol. 8, No. 2, February 1947.

Leukemia as a Possible Complication of Radiodermatitis, Archives of Dermatology and Syphilology, Vol. 62, p. 803-810, December 1950.

Nevus Lipomatomus Cutaneous Superficialisis, American Medical Association, Archives of Dermatology and Syphilology, Vol. 78, p. 479-482, October 1959.

A Contrast of Cutaneous Cancer as Observed in Texas and Minnesota, Archives of Dermatology, Vol. 79, p. 275-283, March 1959.

Recognition and Management of the Cutaneous Precanceroses, Postgraduate Medicine, Vol. 27, No. 3, pp. 337-355, March 1960.

Electron Microscopy of Virus-Like Particles in a Keratoacanthoma, Vol. 37. No. 2, August, 1961, pp. 79-84. (With A.S. Zelickson, M.D.)

An Association Between Bowen's Disease and Internal Cancer, Archives of Dermatology, Vol. 84, pp. 623-629, October, 1961. (With Edward S. Peterka,M.D. and Robert W. Goltz, M.D.)

Yosh Maruyama, M.D.

COLLEGE, MEDICAL SCHOOL, INTERNSHIP AND RESIDENCY:

A.B. (Biochemistry)	1951	University of Calif., Berkeley, Calif.
M.D.	1955	University of Calif., San Francisco, Calif.
Intern	1955-56	San Francisco Hospital, University of Calif. Svc., San Francisco, Calif.
Resident (Radiology)	1958-61	Massachusetts Genral Hospital, Harvard Medical School, Boston, Mass; Chief Resident,'61.

SPECIAL CERTIFICATION: Diplomate, American Board of Radiology, 1961.

SPECIAL FELLOWSHIPS AND TRAINING:

American Cancer Society Clinical Fellow, 1960-61, Massachusetts General Hospital, Harvard Medical School, Boston, Massachusetts.

James Picker Advanced Fellow in Academic Radiology, 1962-64, Stanford University Medical School, Palo Alto, California, u/d H.S. Kaplan.

Special Traveling Fellow of the James Picker Foundation, 1964; to radiotherapy and radiobiological centers in Scandanavia, England & France.

STAFF POSITIONS:

Assistant Professor of Radiology, Division of Radiotherapy, University of Minnesota Hospitals, Minneapolis, Minnesota, 1964-67.

Associate Professor of Radiology, Division of Radiotherapy, University of Minnesota Hospitals, Minneapolis, Minnesota, 1967-

Acting Administrator, Division of Radiotherapy, University of Minnesota Hospitals, Minneapolis, Minnesota, 1968.

SOCIETIES:

Sigma Xi, Phi Beta Kappa, Alpha Omega Alpha
American Association for Cancer Research
American Society of Therapeutic Radiologists
American Association of University Professors
American Association for Advancement of Science
Society for Experimental Biology or Medicine
Radiological Society of North America
American Radium Society
American College of Radiology
Minnesota Academy of Science
Minnesota Radiological Soc.
Radiation Research Society

MILITARY SERVICE: Capt., MC 56-58; Radiologist to Chief of Service, Tokyo, U.S. Army Hospital, Tokyo, Japan.

RESEARCH INTERESTS: Radiotherapy, Radiobiology, mouse tumor cell (lymphoma) biology

BIBLIOGRAPHY

Y. Maruyama, An Isotopic Method for determination of cell generation time. Nature (London) 198 1181-3 (1963)

Y. Maruyama and B.W. Brown, The growth of murine lymphomatous tumor cells as determined by host survival time. Int. J. Rad. Biol. 8 59 (1964)

Y. Maruyama, G. Silini, H.S. Kaplan.Studies of the LSA ascites lumphoma of C57BL mice. II Radiosensitization in vivo with 5-bromodeoxycytidine and combined 5-FudR and 5-bromodeoxycytidine. Int. J. Rad. Biol. 5 453 (1963)

Y. Maruyama, Contribution of host-resistance to radiosensitivity of an isologous murine lymphoma in vivo Int. J. Rad. Biol. 12 277 (1967)

Y. Maruyama and E.A. Johnson Quantitative study of isologous tumor cell in activation and effective cell fraction for the LSA mouse lymphoma Cancer 23 309 (1969)

Robert John McCollister

BIRTHDATE: July 27, 1928, Iowa City, Iowa

DEGREES:

State University of Iowa	1945-1949	B.A. degree in 1949
State University of Iowa	1948-1952	M.D. degree in 1952
University of Minnesota Graduate School	1955-1959	None

POSITIONS:

1952-53	Intern at Highland Alameda County Hospital, Oakland, California
1953-55	Lt. and Capt., USAF (Flight Surgeon)
1955-59	Resident in Medicine, Veterans Administration Hospital, Mpls.
1959-60	Chief Resident in Medicine, University Hospital, Minneapolis
1960-61	Instructor in Medicine, University of Minnesota, Minneapolis
1961-62	Instructor in Medicine, Duke University
1962-65	Instructor in Medicine, University of Minnesota, Minneapolis
1965	Assistant Professor of Medicine, University of Minnesota
1964	Assistant Dean, Medical Student Affairs, University of Minn.

COLLEGE HONORARY SOCIETY: Delta Phi Alpha (Honorary German Fraternity)

SOCIETIES: Minneapolis Society of Internal Medicine
American Federation for Clinical Research
American Society of Hematology
Hennepin County Medical Society

BIBLIOGRAPHY

1. McCollister, R.J., Metabolism of Melanin Pigment, Minnesota Medicine, 39:800-802, 831, 1956.
2. Flink, E.B., McCollister, R., Prasad, A.S., Melby, J.C., Doe, R.P., Evidences for Clinical Magnesium Deficiency, Ann. Int. Med., 47:956-968, 1957.
3. McCollister, R., Flink, E.B., Doe, R.P., Magnesium Deficiency in Chronic Alcoholism, J. Lab. Clin., Med. 52:928, 1958.
4. McCollister, R., Prasad, A.S., Doe, R.P., Flink, E.B., Normal Renal Magnesium Clearance and the Effect of Water Loading, Chlorothiazide and Ethanol on Magnesium Excretion, J. Lab. Clin. Med. 52:928, 1958 (Abstract)
5. Prasad, A.S., Zinneman, H.H., Flink, E.B., McCollister, R.J., Magnesium Protein Relationship and Status of Ultrafilterable Magnesium in Normal and Abnormal Human Sera, Clin. Res., (Abstrac t) 6:260-261, 1958.
6. McCollister, R.J., Flink, E.B., Doe, R.P., Magnesium Balance Studies in Chronic Alcoholism, J. Lab. Clin. Med., 55:98, 1960.
7. McCollister, R.J., Flink, E.B., Lewis, M.D., Urinary Excretion of Magnesium in Man Following the Ingestion of Ethanol, Amer. J. Clin. Nutr. 12:415-420, 1963.
8. McCollister, R.J., Gilbert, W.R., Ashton, D., Wyngaarden, J.B., Pseudo Feed Back Inhibition of Purine Biosynthesis by 6-MP Ribonucleotides and Other Purine Analogs, J. Biol. Chem, 239:1560-1563, 1964.

BIOGRAPHICAL SKETCH

NAME: John H. Moe, M.D.

Date of Birth: August 14, 1905

Place of Birth: Grafton, North Dakota

Education: B.S. Degree from the University of North Dakota, 1927
M.B. Degree from Northwestern University, 1929
M.D. Degree from Northwestern University, 1930

Staff Positions: Professor and Chairman, Department of Orthopedic Surgery
University of Minnesota Medical School, Minneapolis

Chief of Staff, Gillette State Hospital for Crippled Children, St. Paul, Minnesota

Consulting and honorary Staff: St. Mary's Hospital, Fairview Hospital, Northwestern Hospital, and Hennepin County General Hospital

Medical Associations:
American Orthopaedic Association
American Academy of Orthopaedic Surgeons
Pan Pacific Surgical Association
Chicago Orthopaedic Society
Clinical Orthopaedic Society
American College of Surgeons
American Medical Association
Minnesota Medical Association
Hennepin County Medical Association
S.I.C.O.T.

Office Address: University of Minnesota Hospitals
Department of Orthopedic Surgery
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Minneapolis, Minnesota 55455

PUBLICATIONS:

Moe, John H.: Complications of Scoliosis Treatment, Clinical Orthopedics, No. 53, July-August, 1967, p. 21-30.

Winter, Robert B., Moe, John H., and Eilers, Vincent E.: Congenital Scoliosis: A Study of 234 Patients Treated and Untreated. J. Bone and Joint Surg., Vol. 50-A, No. 1, Jan. 1968. p. 1-47.

RESEARCH:

1. Milwaukee Brace--A Long Term Study

2. Marfan's Syndrome and Scoliosis

3. Radiographic Interpretation of Vertebral Rotation

4. Halo-Femoral Traction in the Treatment of Scoliosis

5. Pulmonary Functions in Pre- and Post-Operative Scoliosis

6. Patterns of Idiopathic Scoliosis

1. Long term studies of Milwaukee Brace usage in idiopathic scoliosis have been computerized, analyzing the effects of location and severity of curve, duration of various stages of therapy, age, and maturation of patient and complications of brace usage.

2. Marfan's Syndrome has always been associated with scoliosis; there has been no comprehensive survey of the aspects of this association. A review of patients at Gillette and the University Hospitals provides an insight into this special type of scoliosis.

3. Rotation is a poorly understood component of scoliosis, yet it is responsible for most of the deformity present in the thoracic region. Part of the difficulty is due to the measurement of this factor. Correlation of x-rays and photographs of cadaver vertebrae assist in these studies.

4. Approximately fifty severe scoliotics have been subjected to halo-femoral pin traction. The effectiveness of this adjurant, the complications, indications, and contraindications are analyzed.

5. One of the major problems of untreated scoliosis is the development of cardio-pulmonary embarassment due to deformity and restriction of thoracic cage motion. Reduction of the curvature plus fusion does not significantly alter pulmonary function despite subjective endurance improvement. Validation of this improvement is under study.

6. The patterns of idiopathic scoliosis are fairly fixed with respect to location, age, and direction of the curve. The large population under therapy at Gillette and University Hospitals provides a matrix for computer analysis which is underway.

Robert O. Mulhausen, M.D.

BIRTHDATE: June 7, 1930, Chicago, Illinois

EDUCATION: University of Illinois, B.S., Chemistry, 1951
University of Illinois, B.S., Medicine, 1953
University of Illinois, M.D., 1955
University of Minnesota, M.S., Internal Medicine, 1964

Internship: Ancker Hospital, St. Paul, 1955-56
Residency: Internal Medicine, Minneapolis Veterans Hospital, 1956-59
Graduate School, Medical Fellow, University of Minnesota, 1956-59
Diplomate, American Board of Internal Medicine, 1962
Fellow, American College of Physicians, 1965

Fulbright Research Award (with Poul Astrup, Copenhagen University, Denmark) 1965-66

PROFESSIONAL EXPERIENCE:

Staff Physician, Medical Service, Minneapolis V.A. Hospital	1959-60
Assistant Chief, Medical Service, Minneapolis V.A. Hospital	1960-67
Instructor, Department of Medicine, University of Minnesota	1959-64
Assistant Professor, Department of Medicine, Univ. of Minn.	1964-69
Assistant Dean, College of Medical Sciences, Univ. of Minn.	1969-67-
Associate Professor, Department of Medicine, Univ. of Minn.	1969-

RESEARCH ACTIVITIES: Blood gas and renal research

SOCIETIES: American College of Physicians
American Federation for Clinical Research
American Society of Nephrology
Association American Medical Colleges
Minnesota Society of Internal Medicine
Minneapolis Society of Internal Medicine

SELECTED BIBLIOGRAPHY

Mulhausen, Robert, Eichenholz, A., and Redleaf, Paul: Effect of high CO_2 tension on banked ACD blood. Clinical Research, 10:293, Oct. 1962 (Abstract)

Mulhausen, Robt., Eichenholz, A., and Blumentals, A.: Acid-base disturbances in patients with cirrhosis of the liver. Medicine, 46:185, 1967.

Mulhausen, Robert, Astrup, P., and Kjeldsen, K.: Oxygen affinity of hemoglobin in patients with cardiovascular disease, anemia, and cirrhosis of the liver. Scand. J. Lab. Clin. Invest. 19:291, 1967.

Mulhausen, Robert, Astrup P., and Mellemgaard, K. Oxygen affinity and acid-base status of human blood during exposure to hypoxia and carbon monoxide. Scand. J. Clin. Lab. Invest. Suppl. 103:9, 1968.

Mulhausen, R., Brown, D., Onstand, G. Renal clearance of amylase in patients with pancreatitis. Accepted for publication.

John S. Najarian, M. D.

Personal Statistics:

Date of Birth: December 22, 1927
Place of Birth: Oakland, California
Marital Status: Married, four children

Education:

University of California, 1945 - 1948, AB with Honors
University of California Medical School, 1948 - 1952, M. D.

Military Service:

Division Surgeon, 34th Air Division (IEF) USAF, 1953 - 1955, Albuquerque, New Mexico

Post Doctoral Training:

Internship - straight surgical, University of California Medical School, 1952 - 1953
Residency - surgical, University of California Medical School, 1955 - 1960

Research Training:

Surgical Physiology, University of California Medical School, 1955 - 1956
Immunopathology, University of Pittsburgh Medical School, Special Research Fellow, NIH, 1960 - 1961
Tissue Transplantation Immunology, Scripps Clinic and Research Foundation La Jolla, California, Senior Fellow and Associate NIH, 1961 - 1963

Honors:

Alpha Omega Alpha
Markle Scholar in Academic Medicine, 1964 - 1969
California Trudeau Society Award, 1962
University of California Football Alumnus - of the Year - 1967

Professional Organizations:

Diplomate, American Board of Surgery
Fellow, American College of Surgeons
Society of University Surgeons
The Howard C. Naffziger Surgical Society
Society for Experimental Biology and Medicine
American Association for the Advancement of Science
American Society for Experimental Pathology
American Association of Immunologists
Hagfish Society (Immunology)
American Medical Association
Transplantation Society
Halsted Surgical Society
The American Society of Nephrology
The Association for Academic Surgery
Minneapolis Surgical Society
Internat'l. Soc. of Nephrology
Surgical Biology Club

Staff Positions:

Assistant Professor of Surgery, Department of Surgery, University of California, San Francisco, California, 1963-1966; Professor and Vice Chairman, 1966-1967.

Professor and Chairman, Department of Surgery, College of Medical Sciences, University of Minnesota, Minneapolis, July 1967 - present.

Other:

NIH, Special Consultant, Clinical Research Training Committee, Institute of General Medical Sciences, 1965-1969.
Consultant, United States Bureau of the Budget, 1966-1968.
Member, Advisory Committee on Hemodialysis and Renal Transplantation, Department of Public Welfare, Minnesota State Medical Association.
Consultant, Midwest Chapter of National Kidney Foundation.
Council Member, Midwinter Conference of Immunologists.
National Advisory Council, National Kidney Foundation
Editorial Boards -

Journal of Surgical Research, 1968 -
Minnesota Medicine, 1968 -
American Journal of Surgery, 1968 -
Journal of Surgical Oncology, 1969 -

SELECTED BIBLIOGRAPHY
for
John S. Najarian, M.D.

Najarian, J. S.: The role of the lymphocyte in homograft rejection. In: J.M. Yoffey (Ed.), The Symposium on the Lymphocyte in Immunology and Haemopoiesis. E. Arnold (Publisher) Ltd., Bristol, 266-278, April 1966.

Najarian, J.S. and Perper, R. J.: Participation of humoral antibody in organ transplantation rejection. Surgery, 62: No. 1, 213-220, July 1967.

Payne, R., Perkins, H.A., and Najarian, J.S. : Compatibility for seven leukocyte antigens in renal homografts: Utilization of a micro-agglutination test with few sera. Presented at the International Transplantation Conference held in Paris, France, June 1967. Published in Histocompatibility Testing, 1967.

Merkel, F.K., and Moore, G. E., Najarian, J. S.: Preparation, testing and use of human anti-lymphoblast serum. Fed. Proc., 27: No. 2, 307, March-April 1968.

Perper, R.J., Merkel, F.K., and Najarian, J.S.: Prolongation of renal xenograft survival. JAMA, 204: 531, 1968.

Najarian, J.S.: Organ Transplantation Immunology. To be published in Handbook of Surgery, 3rd Edition, Lange Medical Publications, Los Altos, Calif., 1969.

Cochrum, K.C., Dykman, L., Najarian, J.S., and Fudenberg, H.H.: A new source of large numbers of lymphocytes and studies on their culture. (Monograph) Third Annual Leukocyte Culture Conference, Iowa City, Iowa, Nov. 9, 1967.

Cochrum, K.C., Okimoto, J.T., and Najarian, J.S.: Experimental thoracic duct shunt. J. Appl. Physiol., 24: 247, 1968.

Najarian, J.S. and Foker, J.E.: Mechanisms of kidney allograft rejection. Transplantation Proceedings, 1: 184-193, 1969 (March).

Lillehei, R.C., Idezuki, Y., Kelly, W.D., Najarian, J.S., Merkel, F., and Coetz, F.C. Transplantation of the intestines and pancreas. Text for the Transplantation Soc., Second International Conf., Sept. 7-11, 1968, New York City, New York. Transplantation Proceedings, 1: 230, 1969 (March).

Perper, R.J. and Najarian, J.S.: Host fixation and kinetics of antitissue antibodies. Transplantation, 6: 833-843, 1968 (October).

Simmons, R. L. and Najarian, J.S.: Organ Transplantation. Submitted to Handbook of Surgery, 1968. To be published.

Najarian, J.S., Simmons, R.L., Moberg, A., Gewurz, H., Merkel, F.K., and Moore, G.E.: Anti-serum to cultured human lymphoblasts. To be published in Annals of Surgery.

CURRICULUM VITAE

for

Michael M. Paparella, M.D.

Date and Place of Birth: February 13, 1933; Detroit, Michigan

Religion: Protestant

Nationality: American

Education and Employment Experience:

1950 - 1953	(B.S.) University of Michigan, Ann Arbor, Michigan
1953 - 1957	(M.D.) University of Michigan, Ann Arbor, Michigan
1957 - 1958	Rotating Internship, Emanuel Hospital, Portland, Oregon
1958 - 1961	Residency in Otolaryngology, Henry Ford Hospital, Detroit Michigan
1960 - 1961	Junior Member of Staff, Henry Ford Hospital, Detroit, Michigan
1961 - 1963	Chief; Ear, Nose and Throat Department, U.S. Army Hospital (20th Station Hospital) Nuremburg, Germany
July 1, 1963 to	Full-time geographic staff in Otolaryngology, Massachusetts Eye and Ear Infirmary
July 1, 1964	Assistant in Otolaryngology, Massachusetts Eye and Ear Infirmary
	Instructor in Otolaryngology, Harvard Medical School, Boston, Massachusetts
July 1, 1964 to	Assistant Professor, Department of Otolaryngology and Consultant, Veterans Administration Hospital, Dayton, Ohio
Apr. 1, 1967	Director of the Otological Research Laboratory, Ohio State University, College of Medicine, Columbus, Ohio
Apr. 1, 1967 to Present	Professor (April 1, 1967) and Chairman (July 1, 1967), Department of Otolaryngology, University of Minnesota, Minneapolis, Minn.

Honors:

Kobrak Research Award, 1960
Travel Fellowship to VII International Congress of Otolaryngology, Tokyo, Japan; October, 1965
Various scholarships throughout medical school

Major Research Interests:

Research Otology

Medical License:

1958, State of Michigan
1963, State of Massachusetts
1964, State of Ohio
1967, State of Minnesota

Certified:

American Board of Otolaryngology; October, 1963

Professional and Scientific Societies:

Alpha Kappa Kappa
American Medical Association
Columbus Ophthalmological and Otolaryngological Society
New England Otolaryngological Society
Academy of Medicine of Columbus and Franklin County
Ohio State Medical Association
Pan American Medical Association
Fellowship in the American Academy of Ophthalmology and Otolaryngology
Member of the American Laryngological, Rhinological and Otological Society, Inc.
Member of the Centurion Club, The Deafness Research Foundation
Member of the American Academy of Ophthalmology and Otolaryngology Committee on Conservation of Hearing and Chairman of Subcommittee on Evaluation of New Information
Member of the Editorial Board, The Laryngoscope
The Society of University Otolaryngologists
The Hennepin County Medical Society and the Minnesota Academy of Ophthalmology and Otolaryngology
Board of Directors of the Pre-School Medical Survey of Vision and Hearing
Member of Society of Sigma Xi
Member of American Otological Society
Editorial Board, "Minnesota Medicine"
Specialty Consultant, "Modern Medicine"
Member of the American Association for Laboratory Animal Science

Publications:

Author of more than 40 scientific publications in the field of Otolaryngology including several chapters of books and three textbooks -- Atlas of Ear Surgery (Mosby Publishing Company), Biochemistry of the Ear (Academic Press) and Textbook of Otolaryngology (in preparation -- 3 volumes).

SELECTED PUBLICATIONS
of
Michael M. Paparella, M.D.

A High-Frequency Microvibrator (Bioacoustical Effects). A.M.A. Arch. Otolaryng. 74:112, 1961.

Stimulation Deafness. A chapter in Sensorineural Hearing Processes and Disorders, Henry Ford Hospital International Symposium on Sensorineural Hearing Processes and Disorders. Little Brown and Company, 1967. Paper presented on March 26, 1965.

Atlas of Ear Surgery (with William H. Saunders, M.D.) C. V. Mosby Publishing Company (October) 1968. This book includes the current surgical techniques of leading otologists of various countries. The first section of the book consists of an outline for dissection of temporal bones.

Experimental Tympanoplasty, The Laryngoscope (October) 1967.

Symposium on Biochemical Mechanisms of Hearing and Deafness, Editor; C. Thomas Publisher (in press).

CURRICULUM VITAE

Harold O. Peterson, M.D.

BIRTH DATE: April 13, 1909

DEGREES: B.S. - Minnesota - 1930
B.M. - Minnesota - 1933
M.D. - Minnesota - 1934

INTERNSHIP: Kansas City General Hospital, Kansas City, Missouri 1933-1934

RESIDENCY: Radiology, Massachusetts General Hospital, Boston, Massachusetts - January 1935 through December 1936

UNIVERSITY APPOINTMENTS: January 1937 to September 1940 - Instructor in Radiology, University of Minnesota
October 1, 1940 to July 1, 1956 - Clinical Instructor, Clinical Assistant Professor and Clinical Associate Professor in Radiology, University of Minnesota
July 1, 1956 to June 30, 1957 - Clinical Professor in Radiology, University of Minnesota
September 1957 - Professor and Head, Department of Radiology, University of Minnesota

MEDICAL SOCIETIES: Radiological Society of North America
American Roentgen Ray Society
Diplomate of Board of Radiology - 1938
Fellow of College of Radiology
Fellow of American College of Chest Physicians
American Association of University Professors
American Society of Neuroradiology - Charter and Founding Member
Vice President - 1966; President - 1967
Association of American Medical Colleges
American Society of Pediatric Radiology - Charter and Founding Member
Minnesota Academy of Medicine - President-Elect 1969
American Academy of Neurology (Associate Member) (Honorary Member)
American Association of Neurological Surgeons (Harvey Cushing Society) Associate Member

OFFICES IN NATIONAL SOCIETIES:
Trustee of American Board of Radiology 1959-1965 -- 1965-present
Chancellor, American College of Radiology 1958-1962 -- 1965-1969
Director, Instructional Courses, American Roentgen Ray Society, 1957 - present
Vice President, American College of Radiology -- 1963-64
President Elect, American Roentgen Ray Society - 1963; President 1964
Chairman - Committee on Technologist Affairs - ACR 1965-1969
Vice President, American Society of Neuroradiology - 1966; President - 1967

LECTURES DELIVERED:
Henry K. Pancoast Lecture - Philadelphia - 1956
Freedman Lectures - University of Cincinnati - April 1959
Caldwell Lecture - American Roentgen Ray Society - 1961 - Gold Medal
Fred J. Hodges Lecture - Ann Arbor - May 1962
Russel D. Carman Lecture - St. Louis Medical Society - St. Louis - October 16, 1962
Annual Lecture, Canadian Association of Radiologists - Winnipeg - January 1962
Leon Manville Lecture - Louisiana State Medical Society - New Orleans - May 1963
Rose Golden Lecture - New York Roentgen Society - April 1964
Leo G. Rigler Lecture - Tel Aviv, Israel - April 1965
George W. Holmes Lecture - New England Roentgen Ray Society - May 1965
Kirklin-Weber Memorial Lecture - Mayo Clinic - 1965

SELECTED PUBLICATIONS OF HAROLD O. PETERSON

1. Peterson, H.: Benign Adenoma of the Bronchus. American Journal of Roentgenology, Radiation Therapy, Vol. 36, no. 6, pp. 836-43, 1936.

2. Peterson, H., G. W. Holmes: Roentgen Analysis of Cases of Ureteral Stone. American Journal of Roentgenology, Radium Therapy, Vol. 37, no. 44, pp. 479-83, 1937.

3. Peterson, H., A. B. Baker: Difficulties in Differentiating Midbrain Lesions from Cerebellar Lesions. American Journal of Roentgenology and Radium Therapy, 46: 37-51, July 1941.

4. Peterson, H., W. T. Peyton: Congenital Deformities in the Region of the Foramen Magnum: Basilar Impression. Radiology, 38: 131-44, February 1942.

5. Peterson, H.: The Value of the X-ray Examination in the Diagnosis of Ruptured Intervertebral Disc. Minnesota Medicine, 29: 904, September, 1946.

6. Peterson, H.: Diagnostic Methods: 1 Roentgenography. Clinical Neurology, Vol. 1, pp. 103-200, 1955.

7. Peterson, H.: Reliability and Limitations of X-ray Diagnosis of Intracranial Neoplasm. American Journal Surgery, Vol. 93, June 1957, pp. 941.

8. Peterson, H.: Dircography. Post. Grad. Medicine 23: 512, May, 1958.

9. Peterson, H.: Diagnostic Methods - Chapter 1 - Roentgenography, Clinical Neurology, Vol. 1, Second Edition - Revised 1961. Hoeber and Harper.

10. Peterson, H.: Radiologist and Special Procedures. American Journal of Roentgenology, July, 1962, Vol. 88, no. 1, pp. 1-20.

11. Peterson, H., with Kurt Asplata: Chapter in Book edited by Lewis Etter on "The Science of Ionizing Radiation - Modes of Application". Charles Thomas Publisher, 1964.

12. Peterson, H.: First A Radiologist - Presidential Address - American Roentgen Ray Society. American Journal of Roentgenology - December, 1964.

13. Peterson, H., Stephen A. Kieffer: Developmental Changes in the Intervertebral Disc. Roentgen-Anatomic Correlation. University of Minnesota Bulletin - Vol. 38, no. 7, pp. 214 - March, 1967.

CURRICULUM VITAE

Biography

Name: John J. Sciarra

Born: March 4, 1932 in West Haven, Connecticut

Education: Yale University, New Haven, Connecticut, B.S., 1953.
M.D.,1957, and Ph.D., Anatomy, 1963, Columbia University.

Major University Appointments:

Assistant Professor, Department of Obstetrics and Gynecology, College of Physicians and Surgeons, Columbia University, New York City, 1965-1968.

Professor and Head, Department of Obstetrics and Gynecology, University of Minnesota Medical School, Minneapolis, 1968-

Research Interests

General: Endocrinology of reproduction
Placental anatomy and physiology

Specific: Protein hormones of the pituitary and placenta
Placental function studies
Investigation of the infertile couple

Selected Bibliography

1. Johnson, P.M.; Sciarra, J.J., and O'Leary, J.A.: Placental scanning with sodium pertechnetate TC-99m bound to serum albumin. Radiology 89:321, 1967.

2. Kaplan, S.L.; Gurpide, E.,; Sciarra, J.J. and Grumbach, M.M.: Metabolic clearance rate and production rate of chorionic growth hormone - prolactin in late pregnancy. J. Clin. Endo. 28:1450, 1968

3. Grumbach, M.M.; Kaplan, S.L, Sciarra, J.J., and Burr, I.M.: Chorionic growth hormone - prolactin (CGP): Secretion, disposition biologic activity in man, and postulated function as "growth hormone of the second half of pregnancy. Ann. N.Y. Acad. Sciences, 148: 501, 1968.

4. Sciarra, J.J.; Sherwood, Louis M.; Varma, Andre A.; and Lundberg, Walter B.: Human placental lactogen (HPL) and placental weight. Am. J. of Obstet. & Gynec. 101:413, 1968.

5. Bell, Jenifer, J,; Canfield, Robert E., and Sciarra, J.J.: Purification and characterization of human chorionic gonadotropin. Endocr. 84:298, 1969.

Frederick Earl Shideman

Born: October 16, 1915 at Albion, Michigan

Married: August 12, 1939 to Margaret E. Reiner, Four children

Degrees:

B.A.	Albion College, Albion, Michigan	1936
Ph.D.	University of Wisconsin Major: Pharmacology Minor: Physiology Thesis subject: Effects of Morphine and its Derivatives on Intermediary Metabolism	1941
M.D.	University of Michigan	1946

Positions Held:

Wisconsin Alumni Research Foundation Research Assistant in Pharmacology, Univ. of Wisconsin Medical School	1936-41
W.A.R.F. Postdoctorate Fellow in Pharmacology, University of Wisconsin Medical School	1941-42
Research Fellow in Pharmacology, University of Michigan	1942-43
Instructor in Pharmacology, University of Michigan	1943-47
Assistant Professor of Pharmacology, University of Michigan	1947-49
Associate Professor of Pharmacology, University of Michigan	1949-52
Professor of Pharmacology and Toxicology, University of Wisconsin	1952-62
Chairman, Department of Pharmacology and Toxicology, University of Wisconsin	1954-62
Professor and Head, Department of Pharmacology, University of Minnesota	1962-

Professional and Honor Societies:

Sigma XI	1939
Phi Lambda Upsilon	1939
Sigma Sigma	1939
Alpha Omega Alpha	1947
American Society for Pharmacology and Experimental Therapeutics	1944

Society for Experimental Biology and Medicine	1947
American Association for the Advancement of Science	1947
Michigan Academy of Science, Arts and Letters	1946
Wisconsin State Medical Society (Honorary)	1956
Phi Beta Kappa (Alumni Membership)	1957
American Institute of Nutrition	1960
Royal Society of Medicine, Fellow	1961
Society of Toxicology	1963
American Therapeutic Society	1963
The Korean Medical Association (Honorary)	1965
The Minnesota Society of Neurological Sciences	1963
American Men of Science	
Who's Who	

Member:

Panel on Sterilization of Blood and Plasma, National Research Council, 1952 - 1955.

Membership Committee, American Society for Pharmacology and Experimental Therapeutics, Inc., 1954-1957.

Study Section on Pharmacology and Experimental Therapeutics, National Institutes of Health, 1960 - 1965, Chairman 1963 - 1965.

Advisory Committee on Personnel for Research, American Cancer Society, 1960 - 1963.

Chairman, Advisory Committee on Personnel for Research, American Cancer Society, 1964 - 1965.

Basic Science Research Study Committee, American Heart Association, 1962 - 1965.

Treasurer, American Society for Pharmacology and Experimental Therapeutics, Inc., 1960 - 1962.

Finance Committee, Chairman, American Society for Pharmacology and Experimental Therapeutics, Inc., 1961 - 1962.

President-elect, American Society for Pharmacology and Experimental Therapeutics, Inc., 1962 - 1963.

President, American Society for Pharmacology and Experimental Therapeutics, Inc., 1963-1964.

Specialty Advisory Board, Postgraduate Medicine, 1963 - .

Pharmacology and Toxicology Training Committee, National Institutes of Health, 1965 - 1969.

Editorial Committee, Annual Review of Pharmacology, 1966 - 1970.

Advisory Committee on Abuse of Depressant and Stimulant Drugs, Food and Drug Administration, 1966 - .

Frederick E. Shideman, Ph.D., M.D.

SELECTED BIBLIOGRAPHY

Synthesis of acetylcholine from labeled choline by brain.
Lawrence W. Chakrin and F. E. Shideman.
Int. J. Neuropharmacol. 7:337, 1968.

The in vivo synthesis and release of tritium labeled acetylcholine by cat cerebral cortex.
Lawrence W. Chakrin, F. E. Shideman and Amedeo Marrazzi.
Int. J. Neuropharmacol. 7:351, 1968.

Catecholamine accumulation in the brains of infant and adult rats after monoamine oxidase inhibition.
A. S. Kulkarni and F. E. Shideman.
European Journal of Pharmacology 3:269, 1968.

A comparison of the absorption, distribution and metabolism of reserpine in infant and adult rats.
R. A. Mueller and F. E. Shideman.
J. Pharmacol. and Exptl. Therap. 163:91, 1968.

Uptake of norepinephrine as a determinant of the magnitude of the inotropic response.
Jacques LeLorier and F. E. Shideman.
Proc. Soc. Exp. Biol. Med. 130:265, 1969.

W. Albert Sullivan, Jr, M. D.

Date and Place of birth - April 6, 1924, Nashville, Tennessee

High School - West End High School, Nashville, Tennessee 1941

Undergraduate Education - The University of the South
Sewanee, Tennessee
Major Chemistry

Medical School - Tulane Medical School 1947
New Orleans, Louisiana

Internship - University of Minnesota Hospitals in straight Surgery
Minneapolis, Minnesota

Residency Training - Department of Surgery, University of Minnesota under
Dr. Owen H. Wangensteen

Special Training for 1½ years (1949-50) in Vascular Surgery under Prof. Rene
Leriche at the American Hospital of Paris in France

First Lt. to Captain in U. S. Army as Surgeon with the 8076th M. A. S. H. in
Korea and subsequently at Camp Carson, Colorado 1951-53.

Director, Cancer Detection Center, University of Minnesota Hospitals 1955 - 1958

Director, Department of Continuation Medical Education
University of Minnesota Medical School 1958 - 1968

Associate Professor of Surgery - 1964
Assistant Dean, and Director of Admissions
University of Minnesota Medical School Nov. 1968

Diplomate American Board of Surgery - 1958
Fellow American College of Surgeons

Member Ramsey County, Minnesota, and American Medical Associations
Central Surgical Society
Minnesota Surgical Society
St. Paul Surgical Society

Member Committee on Continuing Medical Education of the AMA
Advisory Committee on Continuing Medical Education of the Council of
Medical Education of the AMA
Committee on Continuing Medical Education of the Association of American
Medical Colleges and Chairman from 1964 to 1968

Director, Tumor Clinic University of Minnesota Hospitals

Robert A. Ulstrom, B.S., M.D.

DATE OF BIRTH:
February 23, 1923, Minneapolis, Minnesota

EDUCATION:
Medical - University of Minnesota, M.D., 1946

PEDIATRIC POSTGRADUATE TRAINING:
Strong Memorial Hospital, University of Rochester, 1946-48
(Intern and Resident)

ACADEMIC APPOINTMENTS: (All in Departments of Pediatrics)

University of Minnesota	Instructor and Assistant Professor	1950-53
University of California Los Angeles	Assistant Professor	1953-56
University of Minnesota	Associate Professor	1956-61
University of Minnesota	Professor	1961-64
University of California Los Angeles	Professor and Chairman	1964-66
University of Minnesota	Professor and Associate Dean	1966-

SPECIALTY BOARDS:
American Board of Pediatrics, 1953

HONORS:
Alpha Omega Alpha
Markle Scholar in the Medical Sciences, 1954-59

PROFESSIONAL SOCIETIES:
American Pediatric Society
American Society for Clinical Investigation
Central Society for Clinical Research
Endocrine Society
Society for Pediatric Research (Nat. Res. Council Rep. 1961-64)

ADMINISTRATIVE EXPERIENCE:
Director, Pediatric Postgraduate Fellowship Training Program (Departmental 1960-64)
Acting Chairman, Department of Pediatrics, University of Minn. 1961-62
Chairman, Department of Pediatrics, UCLA Center for the Health Sciences 1964-66
Associate Dean, College of Medical Sciences, University of Minnesota 1966-Present
Chairman, Dean's Committee of the Minneapolis VA Hospital, 1968-Present
Chairman, Joint Education Council of the St.Paul-Ramsey Hospital 1967-Present

SPECIAL CLINICAL APPOINTMENTS:
Chief of Pediatrics, Minneapolis General Hospital, 1952-53
Consultant in Pediatrics, Harbor General Hospital, Los Angeles, 1953-56, 1964-66
Consultant in Pediatrics, Hennepin County General Hospital, 1967-Pres.

MISCELLANEOUS APPOINTMENTS:

Editorial Board, Journal of Pediatrics, 1962-65
Member of National Research Council, Division of Medical Sciences, 1961-64
Member of General Medicine Study Section, NIH, 1964-68
Member, Mediaal Advisory Board, Group Health, Inc., 1967-Present

RESEARCH INTERESTS:

The developmental biochemistry of infants and children. Special emphasis on metabolic and endocrinologic aspects of early postnatal life.

BIBLIOGRAPHY

I. Published Articles

Adrenocortical steroid metabolism in newborn infants. I. Urinary excretion of free and conjugated 17-hydroxycorticosteroids in normal full-term infants. Ulstrom, R.A., Colle, E., Burley, J., and Gunville, R.J. of Clinical Endo. and Metab., Vol. XX, No. 8, August, 1960, pp. 1066-1079.

Adrenocortical steroid metabolism in newborn infants. V. Physiologic dispostion of exogenous cortisol loads in the early neonatal period. Reynolds, J., Colle, E., and Ulstrom, R.A., J. of Clinical Endo. and Metab., Vol. XXII, No. 3, March, 1962, pp. 245-254.

Studies of cortisol metabolism in a case of the hypertensive form of congenital adrenal hyperplasia: Demonstration of the absence of 11 beta-dehysroxylation (With J.W. Reynolds). J. of Clinical Endo. and Metab. 23:191, February, 1963.

Ketotic Hypoglycemia (with E. Colle). The Journal of Pediatrics 64:632, May, 1964.

The Enterohepatic Shunting of Bilirubin in the Newborn Infant. I. Use of Oral Activated Charcoal to Reduce Normal Serum Bilirubin Values (with E. Eisenklam). The Journal of Pediatrics 65:27, July, 1964.

Hypoglycemia. Sauls, H., and Ulstrom, R.A. Chapter in Brenneman's Pediatrics ed. by Kelley. Prior & Co. publishers.

Androgen Metabolism in Congenital Adrenal Hyperplasia due to 11-β Hydroxylase Deficiency S.D. Frasier, R. Horton, R.A. Ulstrom accepted for publication in Pediatrics.

CURRICULUM VITAE -

F. H. Van Bergen, Professor and Head, Department of Anesthesiology
Mayo C596 Mayo

Education - High School - Shattuck Military Academy 1929-1930
St. Thomas Military Academy 1930-1933
College - St. Thomas College, 1933-37
University of Minnesota, 1940, B. S.
Medical School - University of Minnesota, 1937-41, M. B.; 1942, M.D.
Internship - U. S. Naval Hospital, Bremerton, Wash., 1941-1942
Residencies - Univ. of Minn. Medical School, 1946-48
Division of Anesthesiology, 1952, M. S.

Field of major interest as undergraduate - chemistry, physiology, pharmacology
Field of major interest as graduate - Anesthesiology, physiology, pharmacology, physics
Honors, Prizes, Scholarships - St. Thomas Military Academy - cum laude,
St. Thomas College - honor student, member of Aesculapian Club

Professional Career - Hospital Staff Appointments
Univ. of Minn. Medical School, Anesthesiology, 1/48-7/53, Instructor
Univ. of Minn. Medical School, Anesthesiology, 7/53-7/54, Assistant Professor and Associate Director
Univ. of Minn. Medical School, Anesthesiology, 7/54-7/55, Associate Professor and Acting Director
Univ. of Minn. Medical School, Anesthesiology, 7/55-7/57, Associate Professor and Head
Univ. of Minn. Medical School, Anesthesiology, 7/57 - present Professor and Chairman

Teaching Affiliations
Consultant in Anesthesiology - Gillette State Hospital for Crippled Children; St. Paul Ramsey Hospital; Hennepin General Hospital

Certification of Board - American Board of Anesthesiology - 1951
License to Practice Medicine - Minnesota, No. 8904, Exam, 1942

Medical and Scientific Organizations - American Medical Association, American Society of Anesthesiologists, Minnesota Society of Anesthesiologists (President, 1955), International Anesthesia Research Society, American Board of Anesthesiologists, Association of University Anesthetists, Academy of Anesthesiology (Immediate Past President), AmericanCollege of Anesthesiology.

CURRICULUM VITAE - F. H. Van Bergen, M. D. con't.

University Organizations - Chairman of the Council of Clinical Sciences
College Promotions Advisory Committee
Honors and Awards Committee
Scholastic Standing

Military Service - Medical Officer, U. S. N., 7/27/41 - 7/1/42
Reserve, Medical Office, 7/42 - 3/46

Books published and inventions -Van Bergen Respirator, 1957 - 1962
Associate Editor, Survey of Anesthesiology, 1957 - 1962
Editor, Anesthesiology, Modern Medicine, 1954 - present

Awards, Citations, honors, etc.
American Society of Anesthesiologists, Certificate of Merit, First Place 1952 Scientific Exhibit, Boston, Massachusetts

Thesis Title: "Surgical Hemorrhage: An Evaluation of its Control by Hexamethonium Induced Hypotension and Postural Ischemia"

BIBLIOGRAPHY

Van Bergen, F. H., Weatherhead, D. S. P., Treloar, Alan E., Dobkin, Allan B. and Buckley, J. J.: Comparison of indirect and direct methods of measuring arterial blood pressure, Circulation, Vol. X, No. 4, October 1954.

Van Bergen, F. H. and Buckley, J. J.: The management of severe systemic tetanus, Anesthesiology, 13:599-604, November, 1952.

Van Bergen, F. H., Buckley, J. J., French, L. A., Dobkin, A. B. and Brown, I. A.: Physiologic alterations associated with hexamethonium-induced hypotension, Anesthesiology 15:507-536, Sept. 1954.

Van Bergen, F. H., Buckley, J.J., Weatherhead, D. S. P., Schultz, E. A. and Gordon, J. R.: A new respirator, Anesthesiology 17:708-723, Sept. -Oct. 1956.

Van Bergen, M. D.: The Mechanical Lung Ventilator as Another 'Black Box". Can. Anaes. Soc. J., Vol. 14, 3:159-182, May 1967.

Dennis W. Watson, Ph. D.
Professor and Head
Department of Microbiology
University of Minnesota

Social Security No. 468-42-1992

Date of Birth: April 29, 1914
Place of Birth: Morpeth, Ontario, Canada
Present citizenship: U.S. citizen

Educational Experience

BSA	University of Toronto	Chemistry	1934
MSc	Dalhousie University	Biochemistry	1937
Ph. D.	University of Wisconsin	Bacteriology	1941

Research Experience

Visiting professor with Dr. O. Westphal, Dr. A. Wander, Forschungsinstitut, Freiburg, Germany, 1960-61.

Major Scientific Interest

Host-parasite interactions, streptococcal toxins, gram negative bacterial toxins, immunochemistry.

Background:

Postdoctoral fellowship, Dept. Bact., Univ. Wisconsin, 1941-42; visiting investigator, Rockefeller Inst. for Med. Res., N. Y., supported by Wisc. Alumni Res. Foundation, 1942; Connaught Laboratories for Med. Res., Univ. Toronto, 1942-44; Med. Consultant Fed. Security Agency, Washington, D. C., 1944; Commissioned U.S. Army, Chem. Warfare Service, Camp Detrick, Frederick, Md., 1944; discharged U.S. Army, 1946; Assist. Prof. Bacteriol., Univ. Wis., 1946-49; Assoc. Prof. Bacteriol. & Immunol., Univ. Minnesota, 1949-52; visiting professor, Univ. Washington, Seattle, 1950; Professor, Bacteriol. & Immunol., Univ. Minnesota, 1952-65; Professor and Head, Dept. Microbiology, Univ. Minnesota, 1965-; USPHS Career Award Professor, 1962-65; Am. Soc. Microbiol.; Am. Assoc. Immunol.; Soc. Exptl. Biol. Med.; Am. Chem. Soc.; Minnesota Path. Soc.; Sigma Xi; AAAS; Assoc. Member, Commission of Immunization, Armed Forces Epidem. Board, 1946-59; member, Board of Scientific Counselors, Div. Biol. Sand., N.I.H., 1957-59; member, Allergy & Immunol. Study Section, N.I.H., 1954-58; member, Training Grant Committee, Inst. Allergy & Infect. Dis., N.I.H. (Chairman, 1964); member, Office of Naval Research Microbiology Panel, 1963-; Council Policy Comm., A.S.M., 1964-; Council, Soc. Exp. Biol. & Med., 1965. Vice President, American Society for Microbiology, 1967-68; Member of Council, National Institute of Allergy & Infectious Diseases, 1967-71. Member, U.S. national Committee of the International Union of Biological Sciences, 1967-73. President, American Society for Microbiology 1968-69.

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DEGREES: B.S.L., University of Minnesota, 1954
B.A., University of Minnesota, 1958
M.H.A., University of Minnesota, 1960

POSITIONS:

University of Rochester Strong Memorial Hosp.	Assistant Administrator & Instructor, Dept. of Health Services	1961-64
University Planning Office and College of Med.Sci.	Research Assoc. and Exec. Sec., Health Sciences Long-Range Planning Committee	1964-67
University of Minnesota University Hospitals	Administrative Director and Assoc. Prof., School of Public Health	1967-

RELATED ACTIVITIES AND MEMBERSHIPS:

1. Chairman, Hospital Advisory Committee, Planning Agency for Hospital of Metropolitan Minneapolis
2. Chairman, Minnesota AAMC-Teaching Hospital Section
3. Chairman, Twin City Hospital Council Education Committee
4. Chairman, Minnesota Hospital Association, Council on Professional Education
5. Member, Association American Medical Colleges - Council of Teaching Hospitals - Subcommittee Mod. & Const. Funds
6. Member, Health Manpower Committee, Northlands Regional Medical Program
7. Member, Health & Welfare Council
8. Member, University Hospitals Executive Council
9. Member, Minnesota School of Nursing Foundation
10. Member, American College of Hospital Administrators
11. Secretary, Variety Club Heart Hospital Board
12. Trustee, Minnesota Hospital Association - Minnesota Hospital Research & Educ. Trust Committee
13. Member, Minnesota Higher Education Coordinating Commission Advisory Committee

ARTICLES

'Parahospital'
December 16, 1960, HOSPITALS

Washington's Program for Chronic Care
January 16, 1962, HOSPITALS

A Hospital Seminar's Role in Medical Education (unpublished 1964)
Co-authored with Leonard D. Fenninger, M.D., Assoc. Dean, U of Rochester School of Med. & Dent., Prof. of Med., Prof. & Chmn., Dept. of Health Services; Med. Director, Strong Memorial Hospital

Problems in Planning & Designing a Teaching Clinic
Co-authored with Robert Douglass Architect, Leo Daly Co., Omaha, Nebraska, Sept. 16, 1967 HOSPITALS

A Descriptive Study of the Strong Memorial Hospital Emergency Dept.
January-July, 1964 (unpublished)
Co-authored with James Pifer, Director, Data Processing Center and Senior Instructor, Dept. of Preventive Medicine

Part I 1 Faculty

FACULTY VACANCIES

At the present time there are approximately 8 vacancies in the senior faculty of the Medical School. This includes one department head, one division head, and 3 faculty members of the Department of Psychiatry. The Head of the Department of Radiology has recently resigned and a faculty search committee has been appointed. In the Department of Radiology, a department search committee is presently seeking a head of the Division of Radiation Therapy. It is hoped that within the next 6 months these two vacancies will be filled. The new head of the Department of Psychiatry, Dr. Hausman, who begins his tenure at the Medical School on July 1, 1969, will soon appoint three faculty members to the Department of Psychiatry.

Part I I Faculty

FACULTY RECRUITMENT

One of the major impediments to faculty recruitment at the University of Minnesota Medical School is the critical shortage of physical facilities, and heretofore the indefinite time table for expansion of these facilities. The plans contained in the Phase I development program of the Health Sciences Expansion will greatly augment the Medical Schools ability to recruit faculty. Relatively limited support of faculty from state sources, with consequent undue reliance on Federal and other outside sources, has further impeded faculty recruitment. The current plans of the University to correct this situation and to bring state support for the operation of the Medical School up to a reasonable standard will greatly enhance the Medical School's ability to recruit faculty.

Part I I Faculty

Faculty Salary Ranges

	Basic Science Departments			Geographic Full-Time Clinical Departments (Including Pathology)		
	Maximum	Minimum	Average	Maximum	Minimum	Average
Dept. Chairman	$34,488	$30,500	$32,695	$30,250	$26,000	$28,375
Professors	28,500	19,760	23,229	35,000	17,250	23,623
Assoc. Professors	21,500	16,500	18,862	32,500	12,250	19,223
Asst. Professors	19,000	10,044	14,377	30,950	10,044	16,111
Instructors	12,000	9,480	11,220	20,838	9,480	12,044

Strict Full-Time Clinical Departments

	Maximum	Minimum	Average
Department Chairman	$52,500	$39,000	$42,500
Professors	38,000	28,800	32,360
Associate Professors	40,000	21,000	27,851
Assistant Professors	27,000	20,000	22,887
Instructors	-0-	-0-	-0-

Projected salary ranges may be computed on the basis of a 5-6% increase per year.

INTRAMURAL PRACTICE PROGRAM

Until several years ago the clinical faculty of the Medical School engaged in a geographic full-time system of medical practice. Under this system the individual faculty member received a basic salary from the University which he augmented by funds from private practice. Three years ago a strict full-time system was developed and was made available on a voluntary basis.

Under the strict full-time system, an individual receives a total University salary which is thought as consisting of two components. "Basic salary" is a salary comparable to that received by other people of comparable rank and stature in various other parts of the University, for example, the Basic Science departments, the Department of Psychology, and the Art College, etc. This segment is subject to the same kind of considerations and negotiated in the same manner as are all University salaries. The second segment is known as a "commutation allowance", which the individual receives in lieu of private fees directly received. This segment is also negotiated each year, but the basis of negotiation is different from that applied to the "basic salary". The commutation allowance is influenced by the particular specialty of the individual and by the nature and extent of his clinical activities within the department. The basic salary and commutation allowance together constitute the individual's University salary for the year in question. The department on the strict full-time basis thus has a substantially higher University salary scale than the department on the geographic type basis.

Commutation allowances are derived from a number of sources, but a good measure comes from the departmental fee pool, into which fees resulting from the professional services of faculty members are placed. Instructional funds provided by the state are not used for commutation allowances. Currently the Department of

Pediatrics, the Department of Physical Medicine and Rehabilitation, the Department of Family Practice and Community Health, the Department of Obstetrics and Gynecology, the Department of Medicine, and a group within the Department of Surgery serve on a strict full-time basis. Certain administrative officers serve on a strict full-time basis as individuals.

There are no intramural practice areas, as such, in the University Hospital. All patients admitted to the out-patient and in-patient services are used for teaching purposes regardless as to whether their faculty physician serves on a geographic full-time or strict full-time basis.

Part I I Faculty

FACULTY APPOINTMENTS

The Dean of the Medical School, upon the recommendation of a faculty search committee, recommends the appointment of Department Heads of the Basic Science departments to the President of the University, who in turn recommends the appointment to the Regents of the University who give final approval to the appointment. Selection of basic science faculty is initiated by the department head with the approval of the Dean with subsequent submission for approval of the appointment to the President and the Regents of the University. The same procedures apply to clinical department appointments.

Part I J

Availability of Patients

1. By policy of the Board of Regents, patients at the University of Minnesota Hospitals are admitted and treated by referral from their own physicians only. Certain exceptions to this policy have been made for specified groups such as Community-University Health Care Center, Obstetrics patients, and Family Practice. Patients come in equal numbers from the twin cities metropolitan area and the rest of the state. Many of the non-private patients have formerly been funded by the progressive welfare programs of the State of Minnesota. With the introduction of Medicare and Medicaid we have found no major shift in types of patients, but rather a shift in source of funding from state/county welfare to these federally sponsored programs.

While the present patient population is adequate for the training of the existing student load, additional students as well as new programs referred to elsewhere will require increasing numbers of patients. To this end other sources of patients are being considered and the strict referral policy is now undergoing review.

2. Outpatients in fiscal 1968 made 113,000 visits to the University Hospitals. During fiscal 1969 this number had increased to 120,000. By 1973 we anticipate on the order of 190,000 although the new clinics are projected to accommodate 250,000 without major expansion. It is the intention of the University Health Sciences to provide more and more services on an ambulatory basis and organize them in such a way as to be efficient for teaching purposes.

It will also be important to expand the outpatient load to provide the base for an increased inpatient census. Inpatient days in fiscal 1968 totaled 230,000 and are expected to reach 275,000 to 280,000 by 1973.

Part II C

RESEARCH SPACE AVAILABLE
(approximate sq. ft.)

Department	Sq. Ft.
Anatomy	15,115
Anesthesiology	1,222
Biochemistry	14,686
Dermatology	2,709
Laboratory Medicine	3,430
Medicine	16,538
Microbiology	14,529
Neurology	8,719
Neurosurgery	1,927
Obstetrics and Gynecology	3,500
Ophthalmology	2,241
Orthropedics	360
Otolaryngology	2,500
Pathology	14,468
Pediatrics	24,991
Pharmacology	14,675
Physical Medicine and Rehabilitation	6,950
Physiology	20,100
Psychiatry	9,236
Radiology	6,259
Radiation Therapy	5,000
Surgery	13,096
Urology	1,459

Part II D Proposed Facilities

SUMMARY OF PROPOSED SCHOOL OF MEDICINE NET EXPANSION AREAS THROUGH 1975
PHASE 1

	Existing Net S.F. 1968	Total Net S.F. 1975
BASIC SCIENCES		
ANATOMY TEACHING LABORATORIES	12,749	17,349
BIOCHEMISTRY TEACHING LABS	4,336	8,325
MICROBIOLOGY TEACHING LABS	5,300	8,657
PATHOLOGY TEACHING LABS	5,445	6,820
PHARMACOLOGY TEACHING LABS	918	7,351
PHYSIOLOGY TEACHING LABS	4,852	7,222
ANATOMY DEPARTMENT	23,699	34,213
BIOCHEMISTRY DEPARTMENT	19,059	37,015
MICROBIOLOGY DEPARTMENT	17,083	23,943
PATHOLOGY DEPARTMENT	21,359	31,481
PHARMACOLOGY DEPARTMENT	18,269	31,490
PHYSIOLOGY DEPARTMENT	27,426	39,184
TOTAL, BASIC SCIENCES	160,495	253,100

SUMMARY OF PROPOSED SCHOOL OF MEDICINE NET EXPANSION AREAS THROUGH 1975
PHASE 1 Continued

	Existing Net S.F. 1968	Total Net S.F. 1975
CLINICAL TEACHING AND RESEARCH		
ANESTHESIOLOGY	2,067	5,627
LABORATORY MEDICINE	34,478	58,408
MEDICINE	23,614	34,464
DERMATOLOGY	4,626	6,026
OBSTETRICS GYNECOLOGY	3,515	8,525
OPHTHALMOLOGY	4,262	7,912
OTOLARYNGOLOGY	3,839	7,839
PEDIATRICS	30,231	44,431
PHYSICAL MEDICINE AND REHABILITATION	40,051	45,751
NEUROLOGY	13,294	20,044
PSYCHIATRY	16,309	23,329
RADIOLOGY DEPARTMENT (SHARED)	6,585	9,585
DIAGNOSTIC RADIOLOGY	13,597	23,567
RADIATION THERAPY-NUCLEAR MEDICINE	6,192	12,462
DEPARTMENT OF SURGERY (SHARED)	10,956	15,266
GENERAL SURGERY	20,341	30,031
NEUROSURGERY	2,805	4,605
ORTHOPEDIC SURGERY	874	2,064
UROLOGY	1,719	2,819
WANGENSTEEN LABORATORY	-	1,800
TOTAL, CLINICAL TEACHING AND RESEARCH	239,355	365,555

PART TWO

Section D, Proposed Facility

Detailed Description of Step I, Unit A:

Unit 'A' will consist of twenty floors of space. Three of these floors are below ground level. The remaining rise 17 stories above the street. (See cross section in lap set). A floor-by-floor description of functions in Unit 'A' is as follows:

Basement

This level will provide the primary location for major mechanical components serving the new construction. Initially, this mechanical area will occupy the basement of Unit 'A'. It will be expanded under Units 'B' and 'C' in subsequent steps. Steam from the University Central Plant will be piped via deep tunnel system to a reducing station on this level. Switch gear pumps, chillers and emergency generating equipment will also be located on floor 10. Major utilities will be distributed in vertical utility shafts located on 50-foot grid to all floors. Building and plant services will also occupy space on this level.

Floor 1

The central service corridor for the Health Sciences at this level connects the various elements and provides vertical service access to the new units. Other major elements are: the lower level of a major shared teaching auditorium, a Medical School Student Adytum, a supply, storage and receiving area and Public Health space for the divisions of Physiological Hygiene and Epidemiology. The Epidemiology division of the School of Public Health provides offices and workrooms for administrative procedures and provides research laboratories, offices (faculty, graduate and field personnel), statistical analysis rooms and the accompanying support areas for graduate teaching and research.

The Laboratory of Physiological Hygiene which provides graduate teaching and research is organized to accommodate visiting test subjects and their related procedures. Subjects enter and go either to the general office and its related faculty offices or directly to the physiology test and exam stations. Subjects do not enter the chemical laboratories although the laboratories relate to the staff and students in both the general office and physiology areas. In general, the central spaces of both divisions are designed for flexibility with fixed support functions around the perimeter. Epidemiology and Physiological Hygiene share conference rooms, a reference and reading room, a clean and sterile room and a shop.

Service to both divisions will be by means of the main service corridor located on this level. Public access from the information and lobby area on floor 2 will be by either bank of elevators that border the space or by stairs.

Floor 2

This level of Unit 'A', one floor below street level is the main public, student, and staff entry and circulation level.Major shared teaching spaces including one-350,

two-250, and one-200-seat auditoria, smaller classrooms, one for 100 and three for 50 students, seventeen seminar rooms for 15 and 20 students, Department of Pathology reference and study area, a student supply area, and a student-study and lounge are located on this level.

Microbiology and Biochemistry undergraduate teaching labs and support areas are convenient to major student circulation areas permitting direct access to the Basic Science research and departmental areas in adjacent existing buildings.

The undergraduate teaching facilities for Microbiology would consist of three teaching laboratories for 50 students each, a demonstration area and support areas for glass preparation, washing, sterilizing, media preparation, incubators and storage. Undergraduate teaching laboratories for Biochemistry include three 32-student teaching laboratories which can be sub-divided into smaller labs of 16 students each, one 24-student lab, centrally placed instrument and preparation rooms, cold rooms, a demonstration room, supply rooms, and small office and darkroom.

When Washington Avenue is tunnelled, an entrance at the north end of Unit 'A' will provide direct access from a public transit drop-off point.

Floor 3, Ground Level

Unit 'A' at street level is occupied by Pathology, Physiology, Pharmacology, Basic Science undergraduate teaching laboratories and supporting facilities. A street level entrance on Delaware Street provides public access to Dental clinics located on upper levels of Unit 'A'.

Physiology teaching facilities include six 24-student laboratories, a large preparation and stock room as well as a special instrument room to serve the laboratories, and a 150 seat demonstration room shared with Pharmacology. Pharmacology teaching facilities consist of six 24-student laboratories, cold rooms, dispensing area, instrument rooms, and active storage. Teaching facilities for Pathology consist of four 28-student labs each equipped with dry lab benches and wall storage cabinets for microscopes and slide boxes. Additional support facilities include a lab for tissue staining and embedding, a gross specimen museum and storage areas for teaching materials.

Floor 4

This floor will house the preclinical teaching facilities of the School of Dentistry. Twelve multipurpose laboratories each seating 25 students will be used for laboratory courses in the Pre-clinical Dental Sciences. All of these rooms will be equipped with closed circuit TV for lectures and demonstrations and will be designed for the use of audio-visual materials. These areas will also be utilized for seminars. Supporting laboratory service rooms, equipment storage space, and a technicians laboratory will be accessible from the laboratories. Freshman and sophomore locker facilities and offices for the pre-clinical faculty will also be located on this floor. Other facilities on the fourth floor will include seminar and auto-tutorial rooms, a general study-lounge for dental students, and a reference-reading room to serve both faculty and students in dentistry. Non-faculty staff lounge-locker facilities will also be located on this floor.

Floor 5

This floor will contain multi-purpose dental laboratories, a multi-purpose laboratory lecture room to seat 78, and supporting areas which will be shared by dental students in the pre-clinical and clinical years. These will also be used on a space available basis for Continuing Dental Education and to some extent the training of dental assistants and dental hygienists. This auxiliary training program will be integrated very closely with the education of the dental students. These facilities include three multi-purpose laboratories each seating 50 students, equipped for teaching clinical laboratory techniques to dental students, assitants, and hygienists. The rooms will be equipped for closed circuit TV with multiple monitors. There will also be supporting laboratories adjacent to the multi-purpose laboratories equipped for plaster work, casting, and burnout procedures. Other spaces include faculy offices and a demonstration room with tiered seating for 32 people. This room will be provided with clinical and laboratory equipment to permit small group demonstrations.

This floor will also include locker facilities for the clinical faculty, junior and senior dental students, dental assitants, and dental hygienists.

Floor 6

This is one of four clinical floors for dentistry and will be the major location for the Divisions of Oral Diagnosis and Oral Surgery. The surgical facilities for Oral surgery, Endodontic surgery, and Periodontic surgery are concentrated in one area. A 27-operatory until of the multi-purpose undergraduate clinic will be on this floor. This unit will be used primarily for undergraduate teaching in Periodontics and Endodontics. Supporting areas include a demonstration operatory, a sterilization room, a student clinical laboratory, and a conference room. Periodontic staff offices will be located nearby.

Clinical facilities for Oral Diagnosis will include 15 dental operatories for the screening of patients, treatment planning, and the teaching of Oral Diagnosis techniques to undergraduate dentistry students and auxiliaries. Supporting facilities will include consultation rooms, a larger operatory for small group demonstrations, a room for instrument sterilization and dispensing of supplies, a clinical lab, and a small plaster room.

With the exception of one or two x-ray rooms on each of the other clinical levels, all facilities for Radiology and film processing will be centralized on this floor, furnishing x-ray services for Oral Diagnosis and all other clinical units of the School of Dentistry. In addition, this area will be used for the teaching of x-ray procedures to undergraduate dental students and auxiliaries. Spaces will include sixteen rooms for instruction in x-ray procedures, special x-ray rooms for wheelchair patients, extra-oral, panographic and cephalometric procedures, an x-ray demonstration room, processing, mounting, and viewing rooms, and an x-ray equipment laboratory.

Reception and waiting areas, staff offices and conference rooms for Oral Diagnosis and Radiology will also be located on this floor.

Oral Surgery operatories will be clustered around an interior sterile corridor immediately accessible to and supporting sterilization and tray preparation areas. This cluster will include 10 surgical operatories and two larger demonstration rooms. A similar, adjacent cluster will be used for Endodontic and Periodontal surgery procedures. Supporting areas will include a recovery room, examining rooms, and a clinical

service laboratory. Faculty offices for the Division of Oral Surgery will also be located here. Appropriate waiting areas will accommodate patients for the multi-purpose and surgical clinics.

Floors 7 and 8

These two floors will contain the primary undergraduate clinical facilities of the School of Dentistry. On each floor 112 multi-purpose operatory cubicles will be arranged in four units of 28, flanking a central waiting and reception area. These operatories will be used for undergraduate instruction in Endodontics, Crown and Bridge, Prosthodontics, Periodontics, and Operative Dentistry procedures, facilitating the team approach to comprehensive dental care.

Supporting areas will be primarily located around the perimeter of each floor along a separate service corridor. They will include demonstration operatories, sterilization rooms, student laboratories, a technical laboratory, and faculty offices. Each floor will also have lounge-study areas for students and areas for informal faculty-student discussion, and a central grouping of teaching spaces which will include two conference rooms, a seminar-reading room, and a number of auto-tutorial carrels.

Floor 9

Specialty clinical teaching areas for the School of Dentistry will be located on this floor. These include undergraduate and graduate teaching programs in Orthodontics, Pediatric Dentistry, and the Cleft Palate - Maxillo-Facial program. Facilities for Continuing Dental Education will also be located on this floor.

The plan for this floor will be similar to the multi-purpose clinical levels with a central reception and waiting area surrounded by groups of operatories and a ring of supporting areas at the perimeter.

The Orthodontic Clinic will have 44 operatories, with interconnecting doors to facilitate team practice by students working with auxiliary personnel. Supporting areas will include demonstration operatories, a sterilization room, a conference room, faculty offices, and a technicians' laboratory to serve all clinical units.

The Pediatric Dentistry Clinic will have 44 operatories arranged similarly, with supporting areas for demonstration, sterilization, staff offices, student laboratories and study rooms. In addition, there will be consultation rooms where individual treatment programs will be discussed with parents, and a conference room for audio-visual demonstrations on dental health care for waiting parents and children. Separate reception and waiting areas will be provided for Orthodontics and Pediatric Dentistry.

Facilities for Continuing Dental Education will include eight dental operatories with a demonstration operatory, clinical laboratory, and an adjacent sterilization room. There will be a small reception and waiting area, an office for the director and an assembly room for seminar groups of up to 75 people.

The Cleft-Palate-Maxillo-Facial Clinic will be located adjacent to the Orthodontics Clinic and will include a small waiting room and four clinical operatories with adjoining offices. This Clinic will also include speech therapy rooms and examining rooms with adjacent rooms for observation, supporting clinical laboratories, a conference room for team interviews and treatment planning, and offices for the director and a secretary-receptionist.

Floor 10

Mechanical space will occupy this entire floor.

Floor 11

This floor will house the Department of Pediatrics, laboratories and supporting facilities. These modular laboratories are located on the sa floor as other future Pediatric laboratory and clinical facilities which will built in Units 'B' and 'C' as a part of Step 2. Other sections of Pediatrics will remain in existing facilities.

Floor 12

Administrative offices, faculty offices and conference rooms for the Department of Pediatrics will be located on this floor. The concentration of offices for the head of the department and 26 senior faculty will provide for maximum interaction. Unit 'B' and Unit 'C', to be constructed in Step 2, will provide additional clinical and laboratory facilities at the same floor level.

Floor 13

The Department of Medicine on this floor has modular laboratories with supporting facilities which include cold rooms, equipment rooms, and a glass-washing room. Related section office modules will contain three 1-man faculty offices, two 2-man junior faculty offices and one secretarial office.

Floor 14

Additional laboratory facilities and related section office modules of the Department of Medicine are located on this floor. The departmental offices and a major conference room for teaching will be located on the same floor of Unit 'B'. The clinical facilities of medicine will be located on the same floor of Unit 'C'.

Floor 15

This floor will house the administrative offices of the School of Dentistry including the offices of the dean and assistant deans. Adjacent to and connecting with these offices will be the Business and Accounting offices. The remaining areas will be used for a faculty lounge and the Division of Health Ecology. A series of small office interview rooms with centrally located reception and waiting areas will be included. In addition, there will be a large data collection room and conference and seminar rooms for groups of up to 60 people.

Floor 16

This floor will contain faculty offices and laboratories for Oral Pathology, Biomaterials, Biostatistics, Speech Pathology and Oral Genetics. There will supporting facilities including storage, service areas, instrument rooms, cold s, and

special purpose spaces, and a conference room to be shared by all disciplines.

This floor will also house photographic and television facilities for the production of educational materials including studios for photography, television and motion pictures, a control room equipped for sound recording, dark rooms, work rooms, and a library for audio-visual materials.

Floor 17

This floor will house faculty offices and laboratories for Oral Physiology and Oral Biology with associated special purpose rooms. In addition, there will be laboratories and offices for programs of research training to be conducted by the various clinical disciplines.

Floor 18

This floor will contain faculty offices and laboratories for Microbiology and Biochemistry, with associated special purpose rooms, including facilities for electron microscopes. Additional space for research training by clinical disciplines will also be available.

Floor 19

This floor will be for animal facilities f[illegible]he School of Dentistry. There will be rooms for housing animals involved in on-[illegible] research and research training, a germ-free room, operating rooms and suppor[illegible]ng areas for cage washing, diet preparation and storage.

ROOM-BY-ROOM TABULATION OF NET ASSIGNABLE AREAS IN STEP 1

Part II E Space Summary

BASIC SCIENCES TEACHING LABORATORIES AND SUPPORT TOTAL 38,375

ROOM	NAME	MEDICAL UNDER-GRAD TEACHING	MEDICAL GRADUATE TEACHING	DENTAL TEACHING	APPLI-CANTS	TOTAL NET
BIOCHEMISTRY					TOTAL	8,325
A2-150	TEACHING LAB	752	192	288	368	1,600
A2-151	COLD ROOM	116	30	44	56	246
A2-152	TEACHING LAB	752	192	288	368	1,600
A2-153	INSTRUMENT RM., DRY	116	30	45	57	248
A2-154	INSTRUMENT RM., WET	100	26	38	49	213
A2-155	STOCK & DISPENSING RM	238	61	91	117	507
A2-156	OFFICE	41	10	16	20	87
A2-157	DARK ROOM	32	8	12	15	67
A2-158	COLD ROOM	116	29	44	57	246
A2-159	DEMONSTRATION ROOM	90	23	35	44	192
A2-160	GLASS WASH & CLEANUP	85	22	33	42	182
A2-161	TEACHING LABORATORY	752	192	288	368	1,600
A2-162	ADVANCED STUDENT LAB	722	184	277	354	1,537
	TOTAL	3,912	999	1,499	1,915	8,325
MICROBIOLOGY					TOTAL	8,657
A2-164	WALK-IN REFRIG. RM.	26	10	17	67	120
A2-165	STERILE ROOM	30	11	19	78	138
A2-166	MEDIA PREP ROOM	82	31	53	214	380
A2-167	CENTRAL STERILE	107	40	70	280	497
A2-168	CENTRAL GLASS & DISPOSAL ROOM	89	33	58	233	413
A2-169	STORAGE ROOM	66	24	42	171	303
A2-170	TEACHING LAB	255	94	165	666	1,180
A2-171	OFFICE	22	8	14	56	100
A2-172	GLASSWARE, REAGENT & DISPEN.	80	30	52	210	372
A2-173	DEMONSTRATION ROOM	220	81	143	575	1,019
A2-174	TEACHING LAB	258	96	168	675	1,197
A2-175	WALK-IN REFRIG.	27	10	17	69	123
A2-176	STORAGE	44	16	29	115	204
A2-177	TEACHING LAB	255	94	165	666	1,180
A2-178	MICRO-PREP ROOM	167	62	109	437	775
A2-179	WALK-IN REFRIG.	23	8	15	60	106
A2-180	MYCOLOGY MUSEUM LAB	28	11	18	74	131
A2-181	BACTERIA VIRUS LAB	39	14	25	100	178
A2-182	STORAGE	22	8	15	58	103
A2-183	WOMEN'S LOCKER, TOILET	30	11	19	78	138
	TOTAL	1,870	692	1,213	4,882	8,657

BASIC SCIENCES TEACHING LABORATORIES AND SUPPORT (CON'T)

ROOM	NAME	MEDICAL UNDER-GRAD TEACHING	MEDICAL GRADUATE TEACHING	DENTAL TEACHING	APPLI-CANTS	TOTAL NET S.F.
PHARMACOLOGY					TOTAL	7,351
A3-110	PREPARATION ROOM (SHARED)	49	9	19	13	90
A3-111	DEMONSTRATION ROOM (SHARED)	444	81	169	113	807
A3-120	LABORATORY	428	78	163	109	778
A3-121	STORAGE	58	11	22	15	106
A3-122	LABORATORY	433	79	165	110	787
A3-123	LABORATORY	429	78	164	109	780
A3-124	STORAGE	231	42	88	59	420
A3-125	INSTRUMENT ROOM	119	22	45	30	216
A3-126	DISPENSING AND PREP	246	45	54	63	448
A3-127	INSTRUMENT ROOM	119	22	45	30	216
A3-128	COLD ROOM	110	20	42	28	200
A3-129	COLD ROOM	110	20	42	28	200
A3-130	LABORATORY	423	77	162	108	770
A3-131	LABORATORY	423	77	162	108	770
A3-132	LABORATORY	420	76	160	107	763
	TOTAL	4,042	737	1,542	1,030	7,351
PATHOLOGY					TOTAL	6,820
A2-120	REFERENCE & STUDY ROOM	850	29	561	-	1,440
A3-100	STORAGE-TEACHING MATERIALS	302	10	200	-	512
A3-101	LABORATORY	469	16	310	-	795
A3-102	STORAGE	63	2	41	-	106
A3-103	LABORATORY	459	16	303	-	778
A3-104	TISSUE STRAINING & PREP	459	16	303	-	778
A3-105	LABORATORY	459	16	303	-	778
A3-106	GROSS SPECIMEN MUSEUM	432	15	285	-	732
A3-107	LABORATORY	469	16	310	-	795
A3-108	STORAGE	63	2	41	-	106
	TOTAL	4,025	138	2,657		6,820

BASIC SCIENCES TEACHING LABORATORIES AND SUPPORT (CON'T)

ROOM	NAME	MEDICAL UNDER-GRAD TEACHING	MEDICAL GRADUATE TEACHING	DENTAL TEACHING	PUBLIC HEALTH	APPLI-CANTS	TOTAL NET S.F.
PHYSIOLOGY						TOTAL	7,222
A3-110	PREP ROOM (SHARED)	34					
A3-111	DEMONSTRATION (SHARED)	306	13	18	11	14	90
A3-112	STOCK & PREP ROOM	539	113	161	97	129	806
A3-113	INSTRUMENT ROOM	141	198	283	170	226	1,416
A3-114	LABORATORY	296	52	74	44	59	370
A3-115	LABORATORY	299	109	156	94	125	780
A3-116	LABORATORY	296	110	157	95	126	787
A3-117	LABORATORY	299	109	156	93	124	778
A3-118	LABORATORY	296	110	157	95	126	787
A3-119	LABORATORY	239	109	156	93	124	778
			88	126	76	101	630
	TOTAL	2,745	1,011	1,444	868	1,154	7,222

GRAND TOTAL FOR BASIC SCIENCE TEACHING LABORATORIES AND SUPPORT

16,594	1,577	8,355	868	8,981	38,375

SHARED CLASSROOMS AND STUDENT FACILITIES TOTAL 26,488

SHARED CLASSROOMS TOTAL 23,247

ROOM	NAME	MEDICAL UNDER-GRAD TEACHING	MEDICAL GRADUATE TEACHING	DENTAL TEACHING	PUBLIC HEALTH	APPLI CANTS	TOTAL NET
A2-100	SEMINAR	241	5		11	11	268
A2-101	SEMINAR	241	5		11	11	268
A2-102	SEMINAR	241	5		11	11	268
A2-103	SEMINAR	199	4		9	10	222
A2-104	SEMINAR	174	4		8	8	194
A2-105	SEMINAR	174	4		8	8	194
A2-106	SEMINAR	174	4		8	8	194
A2-107	STORAGE	21	8	45	24	14	112
A2-108	DISCUSSION ALCOVE	23	8	48	25	16	120
A2-109	AUDITORIUM-200 SEAT	470	168	988	518	316	2460
A2-110	PROJECTION ROOM	23	8	48	25	16	120
A2-111	DISCUSSION ALCOVE	21	8	45	24	14	112
A2-113	CLASSROOM-50 SEAT	120	43	253	133	81	630
A2-114	STORAGE	18	7	39	20	12	96
A2-115	STORAGE	18	7	39	20	12	96
A2-116	CLASSROOM-50 SEAT	120	43	253	133	81	630
A2-117	STORAGE	18	7	39	20	12	96
A2-118	CLASSROOM-50 SEAT	120	43	253	133	81	630
A2-121	CLASSROOM-100 SEAT	220	78	461	242	148	1150
A2-122	STORAGE	39	14	83	43	27	206
A2-123	CLASSROOM-15 SEAT	233	5		11	11	260
A2-124	CLASSROOM-15 SEAT	233	5		11	11	260
A2-125	CLASSROOM-15 SEAT	233	5		11	11	260
A2-126	CLASSROOM-20 SEAT	262	6		12	12	292
A2-127	CLASSROOM-20 SEAT	262	6		12	12	292
A2-128	CLASSROOM-20 SEAT	262	6		12	12	292
A2-129	AUDITORIUM-250 SEAT	544	194	1145	600	367	2850
A2-130	PROJECTION ROOM-CCTV	42	15	89	46	28	220
A2-131	SEMINAR	242	5		11	12	270
A2-132	DISCUSSION ALCOVE	23	8	48	25	16	120
A2-133	PREPARATION ROOM	149	53	314	165	101	782
A2-134	AUDITORIUM-250 SEAT	544	194	1145	600	367	2850
A2-135	DISCUSSION ALCOVE	23	8	48	25	16	120
A2-136	PROJECTION ROOM-CCTV	42	15	89	46	28	220
A2-137	SEMINAR	242	5		11	12	270
A2-138	PROJECTION ROOM-CCTV	51	18	106	56	34	265
A2-139	DISCUSSION ALCOVE	27	10	58	30	19	144
A2-140	DISCUSSION ALCOVE	27	10	58	30	19	144
A2-141	STORAGE	10	4	22	11	7	54
A2-142	SEMINAR	205	4		9	10	228
A2-143	SEMINAR	213	6		9	10	238
A2-144	AUDITORIUM-350 SEAT	796	284	1675	878	537	4170
A2-145	REAR PROJECTION ROOM	111	39	233	122	75	580
	TOTAL	7451	1378	7625	4169	2624	23,247

SHARED CLASSROOMS AND STUDENT FACILITIES (CON'T)

ROOM	NAME	MEDICAL UNDER-GRAD	MEDICAL GRADUATE TEACHING	DENTAL TEACHING	PUBLIC HEALTH	APPLI-CANTS	TOTAL NET
STUDENT FACILITIES						TOTAL	3,241
A2-112	STUDENT STUDY & LOUNGE	415	148	873	458	280	2,175
A2-119	STUDENT SUPPLY CENTER	204	73	429	224	137	1,066
	TOTAL	619	221	1,302	682	417	3,241

GRAND TOTAL OF SHARED CLASSROOMS AND STUDENT FACILITIES

8,070	1,599	8,927	4,851	3,041	26,488

SERVICE FACILITIES TOTAL 15,219

ROOM	NAME	MEDICINE	DENTISTRY	PUBLIC HEALTH	APPLICANTS SPACE	TOTAL NET S.F.
AB-100	BUILDING & PLANT SERVICES	2,156	6,525	717	434	9,832
A1-100	SUPPLY STORAGE & RECEIVING	664	2,009	221	133	3,027
A2-163	JANITOR	23	14	4	9	50
A2-184	JANITOR	60	42	18	36	156
A3-133	JANITOR	56	24	4	10	94
A4-143	JANITOR	-	130	-	-	130
A5-143	JANITOR	-	80	-	-	80
A5-144	RECEIVING	-	80	-	-	80
A6-231	JANITOR	-	75	-	-	75
A6-232	RECEIVING	-	80	-	-	80
A7-172	JANITOR	-	120	-	-	120
A7-173	RECEIVING	-	80	-	-	80
A8-172	JANITOR	-	120	-	-	120
A8-173	RECEIVING	-	80	-	-	80
A9-196	JANITOR	-	120	-	-	120
A9-19[illegible]	RECEIVING	-	80	-	-	80
A11-[illegible]	JANITOR	30	-	-	-	30
A12-[illegible]	JANITOR	125	-	-	-	125
A13-1[illegible]	JANITOR	30	-	-	-	30
A14-117	JANITOR	30		-	-	30
A15-142	JANITOR	-	80	-	-	80
A15-143	RECEIVING	-	80	-	-	80
A16-161	JANITOR	-	80	-	-	80
A16-162	RECEIVING	-	80	-	-	80
A17-162	JANITOR	-	80	-	-	80
A17-163	RECEIVING	-	80	-	-	80
A18-157	JANITOR	-	80	-	-	80
A18-158	RECEIVING	-	80	-	-	80
A19-124	JANITOR	-	80	-	-	80
A19-125	RECEIVING	-	80	-	-	80
TOTAL		3,174	10,459	964	622	15,219

APPLICANT'S SPACE TOTAL 1,114

ROOM	NAME	TOTAL NET S.F.
A1-193	APPLICANTS SPACE	557
A1-194	APPLICANTS SPACE	557
TOTAL		1,114

SCHOOL OF MEDICINE TOTAL 35,431

DEPARTMENT OF PEDIATRICS TOTAL 15,935

ROOM	NAME	MEDICAL TEACHING	MEDICAL RESEARCH	TOTAL NET S. F.
A11-101	ISOTOPE LABORATORY	127	85	212
A11-103	LABORATORY	261	174	435
A11-104	LABORATORY	270	180	450
A11-105	LABORATORY	261	174	435
A11-106	LABORATORY	135	90	225
A11-107	LABORATORY	135	90	225
A11-108	LABORATORY	270	180	450
A11-109	LABORATORY	135	90	225
A11-110	LABORATORY	260	174	434
A11-111	LABORATORY	130	87	217
A11-112	LABORATORY	270	180	450
A11-113	LABORATORY	130	87	217
A11-114	ELECTRON MICROSCOPE ROOM	72	48	120
A11-114A	DARK ROOM	58	39	97
A11-115	LABORATORY	260	174	434
A11-116	LABORATORY	130	87	217
A11-117	LABORATORY	130	87	217
A11-118	LABORATORY	260	173	433
A11-119	LABORATORY	259	173	432
A11-120	LOCKER ROOM	25	17	42
A11-121	SERVICE ROOM	84	56	140
A11-122	CLEAN-UP ROOM	256	170	426
A11-123	LABORATORY	259	173	432
A11-124	INSTRUMENT LABORATORY	259	173	432
A11-125	STERILE ROOM	256	170	426
A11-126	COLD ROOM	127	85	212
	TOTAL	4819	3216	8035

SCHOOL OF MEDICINE (CON'T)

DEPARTMENT OF PEDIATRICS (CON'T)

ROOM	NAME	MEDICAL TEACHING	MEDICAL RESEARCH	TOTAL NET S. F.
A12-100	RECEPTION	75	50	125
A12-101	OFFICE, CHIEF RESIDENT	62	42	104
A12-102	ACCOUNTING OFFICE	204	136	340
A12-103	OFFICE, EXECUTIVE SEC'Y	78	52	130
A12-104	OFFICE, CHAIRMAN	120	80	200
A12-105	CONFERENCE ROOM	156	104	260
A12-106	OFFICE, PRINCIPAL SEC'Y	84	56	140
A12-107	FACULTY OFFICE	72	48	120
A12-108	FACULTY OFFICE	72	48	120
A12-109	CLERICAL POOL	870	580	1450
A12-110	FACULTY OFFICE	72	48	120
A12-111	FACULTY OFFICE	72	48	120
A12-112	FACULTY OFFICE	72	48	120
A12-113	FACULTY OFFICE	72	48	120
A12-114	OFFICE, PRINCIPAL SEC'Y	76	50	126
A12-115	FACULTY OFFICE	72	48	120
A12-116	FACULTY OFFICE	72	48	120
A12-117	FACULTY OFFICE	72	48	120
A12-118	FACULTY OFFICE	72	48	120
A12-119	FACULTY OFFICE	72	48	120
A12-120	FACULTY OFFICE	72	48	120
A12-121	FACULTY OFFICE	72	48	120
A12-122	FACULTY OFFICE	72	48	120
A12-123	FACULTY OFFICE	72	48	120
A12-124	FACULTY OFFICE	72	48	120
A12-125	FACULTY OFFICE	72	48	120
A12-126	CONFERENCE ROOM	540	360	900
A12-127	CHAIR STORAGE	22	14	36
A12-128	PROJECTION BOOTH	14	10	24
A12-129	LOUNGE	161	107	268
A12-130	OFFICE, ACCOUNTANT	78	52	130
A12-131	OFFICE, ACCOUNTANT	78	52	130
A12-132	LOCKER ROOM	120	80	200
A12-134	FACULTY OFFICE	72	48	120
A12-135	FACULTY OFFICE	72	48	120
A12-136	FACULTY OFFICE	72	48	120
A12-137	OFFICE, PRINCIPAL SEC'Y	79	53	132
A12-138	OFFICE, PEDIATRICS ASSOCIATES	132	88	220
A12-139	DUPLICATING & STORAGE	351	234	585
	TOTAL	4740	3160	7900
GRAND TOTAL - DEPARTMENT OF PEDIATRICS		9559	6376	15,935

SCHOOL OF MEDICINE (CON'T)

DEPARTMENT OF MEDICINE TOTAL 15,541

ROOM	NAME	MEDICAL TEACHING	MEDICAL RESEARCH	TOTAL NET S. F.
A13-100	LABORATORY	300	202	502
A13-101	LABORATORY	256	170	426
A13-102	LABORATORY	256	170	426
A13-103	LABORATORY	305	204	509
A13-104	LABORATORY	301	201	502
A13-105	OFFICE	72	48	120
A13-106	OFFICE	72	48	120
A13-107	OFFICE	72	48	120
A13-108	OFFICE	72	48	120
A13-109	OFFICE	72	48	120
A13-111	GAS STORAGE	23	15	38
A13-112	SECRETARY	86	58	144
A13-113	OFFICE	72	48	120
A13-114	OFFICE	72	48	120
A13-115	OFFICE	72	48	120
A13-116	OFFICE	72	48	120
A13-117	SECRETARY	95	64	159
A13-118	OFFICE	72	48	120
A13-119	DARK ROOM	77	51	128
A13-120	BALANCE ROOM	77	51	128
A13-121	EQUIPMENT ROOM	507	338	845
A13-122	GLASS WASH CLEAN-UP	170	113	283
A13-123	GLASS PREP.	131	88	219
A13-124	LABORATORY	206	138	344
A13-125	LABORATORY	258	172	430
A13-126	LABORATORY	258	172	430
A13-127	COLD ROOM & FREEZER	171	114	285
A13-128	LABORATORY	260	174	434
A13-129	COLD ROOM	140	93	233
A13-130	UTILITY STATION	46	30	76
	TOTAL	4643	3098	7741

SCHOOL OF MEDICINE (CON'T)

DEPARTMENT OF MEDICINE

ROOM	NAME	MEDICAL TEACHING	MEDICAL RESEARCH	TOTAL NET S. F.
A14-100	OFFICE, SECRETARY	86	58	144
A14-101	INCUBATOR	41	27	68
A14-102	OFFICE	72	48	120
A14-103	OFFICE	72	48	120
A14-104	OFFICE	72	48	120
A14-105	OFFICE	72	48	120
A14-106	OFFICE	72	48	120
A14-107	LABORATORY	301	201	502
A14-108	LABORATORY	305	204	509
A14-109	LABORATORY	305	204	509
A14-110	LABORATORY	301	201	502
A14-111	OFFICE	72	48	120
A14-112	OFFICE	72	48	120
A14-113	OFFICE	72	48	120
A14-114	OFFICE	72	48	120
A14-115	OFFICE	72	48	120
A14-116	SECRETARY	86	58	144
A14-118	GAS STORAGE	23	15	38
A14-119	OFFICE	72	48	120
A14-120	OFFICE	72	48	120
A14-121	OFFICE	72	48	120
A14-122	OFFICE	72	48	120
A14-123	OFFICE	75	50	125
A14-124	SECRETARY	72	48	120
A14-125	ISOTOPE LABORATORY	97	65	162
A14-126	BALANCE	77	51	128
A14-127	INSTRUMENT ROOM	507	338	845
A14-128	LABORATORY	260	174	434
A14-129	LABORATORY	258	172	430
A14-130	LABORATORY	258	172	430
A14-131	COLD ROOM	156	104	260
A14-132	LABORATORY	260	174	434
A14-133	COLD ROOM	156	104	260
A14-134	UTILITY STATION	46	30	76
	TOTAL	4678	3122	7800
GRAND TOTAL FOR DEPARTMENT OF MEDICINE		9321	6220	15,541

SCHOOL OF MEDICINE (CON'T)

ROOM	NAME	MEDICAL TEACHING	MEDICAL RESEARCH	MEDICAL UNDERGRAD	TOTAL NET
MEDICAL SCHOOL ADYTUM				TOTAL 3,955	
A1-102	VENDING	-	-	353	353
A1-103	TOILET	-	-	229	229
A1-104	LOCKERS	-	-	582	582
A1-105	LOUNGE-STUDY	-	-	2791	2791
	TOTAL	-	-	3955	3955

GRAND TOTAL FOR THE SCHOOL OF MEDICINE

	18,880	12,596	3955	35,431

ANALYSIS
Part 2, Section F

The new facilities of the Health Sciences have been planned not only to accommodate an increase in the size of the Medical School class and the faculty attendant upon such an increase, but also to satisfy the goals of the new curriculum. Space will be provided for both the usual larger classroom and the smaller seminar room where student-faculty interchange is encouraged. Modern teaching devices and audio visual aids are introduced. The student will be provided study space for self instruction. Teaching laboratories are designed to allow optimal student-faculty ratios. They are versatile to allow appropriate use of particular phases of the curriculum. General Design of clinical facilities will allow, insofar as possible, geographical proximity of faculty offices, teaching seminar rooms, patient beds, out-patient facilities, and laboratories. Effeciences of student movement and proximity of student to faculty, laboratory and patient are thus insured.

The Medical student, who would spend his entire day in the milieu of the health sciences complex, will be able to utilize effectively lounge space, eating space, teaching laboratory, study space, classroom and seminar areas all located within a geographical whole, close to faculty areas and within a framework which encourages interchange with other Health Sciences Students.

Programmatic aspects of facilities which are specifically in this current project are as follows:

The Classroom Areas (Unit A, Floor 2) - The amenities of student life, the Medical Student Adytum (Floor 1), student lounges and study areas, and both larger teaching spaces and seminar rooms are located here. Easy access to basic sciences teaching laboratories on this and adjacent floors and close proximity to basic science departmental offices and faculty laboratories in related buildings are provided for the student. Appropriate audio-visual and electronic teaching aids are included in the larger classrooms. Smaller seminar rooms will be outfitted with audio-visual and electronic capabilities for self-instruction use when classrooms are not formally scheduled. Although classrooms are ulitized on a shared basis with the other Health Sciences Disciplines,they are adequate to accommodate the appropriate students in Phase A, B, & D of the Medical School Curriculum.

Biochemistry Teaching Facilities (Unit A, Floor 2) includes three 32 student laboratories which allow 2 sections of students of 96 apiece with expansion into another laboratory for 24 students. The smaller lab is especially appropriate for Phase D students and will contain extra ordinary equipment which can be utilizied effectively by these advanced medical students. A demonstration area with appropriate audio-visual connections to laboratories and separate wet and dry instrument rooms are integrated into the traffic pattern about the teaching laboratories. The laboratories are self sufficient and self contained.

It is planned that 3 instructors will be assigned to each laboratory for 32 students.

Projected utilization of the laboratories is as follows:

Phase A Medical Students: Six hours/week-2 quarters-divided in 2 sections. (three hours/week/student-2 quarters)

Phase B Medical Students: One hour/week/student-all quarters.

Phase D Medical Students: Five to ten students each five hours/day-all quarters

Dentistry Students: Six hours/week-2 quarters-divided into 2 sections. (three hours/week/student-2 quarters)

Graduate Students: Eight hours/day for two days each week - one quarter.

Microbiology Teaching Facilities (Unit A, Floor 2) includes 3 laboratories for 50 students each. This modular form allows a maximum class potential of 300, with 2 sections of 150 students each, as well as versatility to accommodate smaller groups of students as might be expected in Phase D of the curriculum. The laboratories are constructed so that interconnections allow accessibility to senior staff. Since the various phases of the curriculum will demand more demonstration teaching by Microbiology, specific attention has been paid to the provision of an efficiently organized, adequate demonstration area. Since it is expected that the departmental offices and faculty laboratories will be located at some distance from this facility in the Mayo tower, the labs are especially self-contained and self-sufficient including an office for laboratory teaching faculty provided on the site.

It is planned that 9-10 staff will be assigned to 150 students or 3 instructors to each laboratory for 50 students.

Projected utilization of the laboratories is as follows:

Phase A Medical Students: Twelve hours/week-one quarter-divided in 2 sections (Six hours/week/student-one quarter)

Phase D Medical Students: two hours/day-one laboratory-two quarters.

Dentistry Students: Six hours/week-one quarter.

Medical Technology Students: Six hours/week-three quarters-three laboratories.

Pharmacy, Nursing, Liberal Arts Students: Six hours/week-three quarters-three laboratories.

Mortuary Science, Dental Hygienist, Physical Therapy Students: Three hours/week-one quarter-three laboratories.

Microbiology Students: Six hours/week-three quarters-two laboratories.

Graduate Students: thirty-two hours/week-one quarter-two laboratories.

Pharmacology Teaching Facility (Unit A, Floor 3) includes six 24 student laboratories which allow an increased staff to student ratio with free flow of instructors between laboratories and an increased access of students to senior instructors. One half of the Medical School class can be accommodated at one time. The laboratories are multipurpose, allowing performance of physiological, biochemical, or behaviorial pharmacological experiments. An audiovisual and TV hookup with the demonstration area, shared with physiology, is provided so that results of longer experiments may be monitored by students performing other experiments in the laboratories. The facility is self-sufficient with appropriate laboratory supporting facilities.

It is planned that 1½ instructors will be assigned to each laboratory for 24 students.

Projected Utilization of the laboratories is as follows:

Phase B Medical Students: four ½ days/week-for one quarter-divided in 2 sections. (two 3-hour laboratories/student/week, for one quarter)

Phase D Medical Students: two ½ days/week, each quarter.

Dentistry and Pharmacy Students: three ½ days/week - one quarter.

Graduate Students: four ½ days/week - two quarters.

Pathology Teaching Facility (Unit A, Floor 3) consists of four 28 student laboratories allowing a student-instructor ratio of, at most, 28 to 1. Greater than 200 students can be taught in two sections. Laboratories are designed with benches which provide adequate knee room since storage cabinets are located along the walls. This will allow further expansion with potential space for greater than 112 students at one time. Each laboratory can be used as a demonstration area for slide projection. A separate demonstration area for gross and microscopic specimens has been provided along with a preparation room where frozen sections and special techniques can be demonstrated with fresh anatomical specimens. Closed TV will be provided to the autopsy and surgical pathology areas. The laboratories are adaptable for use of both Phase B and D students. Self-instruction is encouraged in the reference and study area (Floor 2) where Pathological material is filed and appropriate audio-visual learning devices are utilized by the students.

Projected utilization of the laboratories and other teaching areas is as follows:

Phase A Medical Students: Eight 2 hour laboratories/week - one quarter-divided in 2 sections. (Four 2 hour laboratories/student/week - one quarter.)

Phase B Medical Students: Four hours/day - all quarters.

Phase D Medical Students: 2 hours/day - one laboratory - all quarters. Special courses:4 hours/day - all quarters-one laboratory

Pathology Teaching Facility-continued

Dentistry Students: Eight 2 hour laboratories/week - one quarter, divided in two sections (four 2 hour laboratories/student/week - one quarter)

Physiology Teaching Facilities (Unit A, Floor 3) include six 24 student laboratories. This number of students per laboratory appears optimum for the appropriate student-instructor ratio and for appropriate student interchange. Interconnections between laboratories encourage faculty interchange. The laboratories are so arranged that they can be utilized as conference rooms, demonstration rooms or laboratories and thus are available for any particular teaching exercise of any phase of the curriculum. The laboratories are self-contained. A larger 130-150 seat demonstration room, equipped with appropriate audio-visual and TV connections with laboratories, is shared with Pharmacology. The demonstration room will be used for discussion of preparation and results of experiments and for observation of demonstrations.

It is planned that, at least, one instructor will be assigned to each 12 students in the laboratories.

Proposed utilization of the laboratories is as follows:

Phase A Medical Students: twelve hours/week-all laboratories-one quarter-divided in 2 sections. (Six hours/student/week - one quarter)

Phase B Medical Students: one hour/day-all laboratories-four quarters.

Phase D Medical Students: six hours/week-five laboratories-four quarters

Dentistry Students: twelve hours/week-all laboratories-one quarter-divided in two sections.

Pharmacy Students: four hours/week-one quarter-three laboratories-divided in two sections.

Nursing Students: six hours/week-one quarter-four hours/week-one quarter-all laboratories-divided in two sections.
two hours/week-three laboratories.

Graduate Students: six hours/week-two laboratories-one quarter.
forty hours/week, as available

(Although facilities for Anatomy are not included in this current project, description of planned facilities will complete the review of basic sciences teaching areas. Expansion of current space for gross Anatomy is planned. Dissection of cadavers in Phase A of the curriculum is planned as is the typical histological instruction. Self instruction with the extensive use of various teaching aids, especially in Phase D Anatomy courses, is anticipated. Specific facilities for preparation and transmission of audio-visual and closed circuit TV teaching aids is a portion of the teaching plan. There will be need for expansion of histology and gross Anatomy laboratories as well as histology preparation areas.)

Department of Pediatrics (Unit A, Floor 11) This first portion of the development of the Pediatrics Department facilities, to be completed in Steps 2 and 3 of Phase I, includes departmental laboratories and supporting facilities. The facilities are designed to accommodate the increased number of Medical Students and the faculty attendant upon their increase. The site is so planned that there will be a continuity of Pediatrics facilities in adjacent new construction. This will allow effective teaching of the clinical students since major portions of the department will be located in geographical proximity with close interrelations between patients, faculty offices, teaching areas, and laboratories. Additional laboratories and Pediatric clinical areas will be located on the same floor level in units B & C.

The laboratories are versatile. Many contain small faculty office modules or study carrels so that expansion for junior faculty offices or student study spaces may be available.

Portions of Pediatric Department laboratories will remain in other portions of the existing Medical School--Hospital complex.

Department of Pediatrics (Unit A, Floor 12) Departmental offices, conference-study areas, and faculty offices are located here. The compact arrangement of offices encourages faculty interaction. Offices are so arranged so as to allow effective use of secretarial assistance. Conference rooms will be of particular use and convenience to the Medical student since arrangement of departmental space allows close proximity of faculty, laboratories, patient beds, and teaching areas.

Clinical facilities and laboratories of the department ar planned in Units B and C at the same floor level.

Department of Medicine (Unit A, Floor 13) This facility is arranged to combine modules of faculty officers with departmental laboratories. Close proximity of similiar facilities on the floor above (Unit A) and of departmental offices and conference rooms and of clinical facilities planned for one floor above in Units B and C, will encourage faculty and faculty-student interaction. This arrangement of the departmental facilities will be appropriate to the clinical training of the student since departmental and faculty offices, conference rooms, laboratories, and bed areas will compactly placed allowing ease of movement and availability of facilities and staff to the student.

Offices are planned to provide effective use of secretarial assistance. The closeness of laboratory to faculty offices is efficient and time-saving.

Department of Medicine (Unit A, Floor 14) This area is similiar to that located on Floor 13 with provision for faculty offices and laboratories. Departmental offices and major teaching conference rooms will be located on the same floor level of Unit B and will continous with the clinical facilities of the department on the same floor of Unit C.

Part II Section G

CONDITION OF EQUIPMENT

The following excerpts describe the condition of equipment which can be used in the facilities described in the current project.

Physiology: Much of the newest equipment (e.g., ink-writing recorders, constant temperature baths) belongs to the Department of Pharmacology. With the development of separate teaching facilities for the department and consequent simultaneous use of equipment, it will be necessary for us to purchase replacements for these items. Other expensive gear such as neurophysiological electronic equipment, kymographs, stimulators, etc., are in reasonable condition, but they are 10-15 years old and in another five years, when the new building is completed, will probably need replacing also.

Pharmacology: In general, the items are quite new and in fine condition. We are requesting new and additional items of equipment.

Microbiology: Most of the vintage equipment presently used in the microbiology teaching laboratory is in a constant state of repair; other necessary items have been installed. Some pieces essential to daily operation may be classed as unsafe for use; examples are the three autoclaves, the age of which approximates thirty years' daily use. The glassware drying and sterilizing oven may no longer be used for sterilizing because its insulation has deteriorated. Some of the water baths are World War II surplus property with makeshift replacement parts. The common incubator room used by both staff and students is non-functional; a variation of 2-3° C may be found in this room where a o.5 degree change is critical.

In the four instructional laboratories and supporting area the lighting is of such inferior quality that many observations are either missed or difficult to make. Although re-constructed lately, the entire area is still lacking an adequate room air supply. Only makeshift hoods, both chemical and microbial, are available in the area for handling the many pathogenic microbial agents in daily use.

Pathology: The equipment which is presently used in teaching consists of (1) Bausch & Lomb microprojector, (1) Golde slide projector for 2 inch and 3½ x 4 inch lantern slides and (1) American Optical projector for 2 inch lantern slides. Each of these pieces of equipment is between 15 and 20 years old. In the Bell Museum there are six Argus Executive projectors (short throw console types). These are 3 years old.

Biochemistry: Equipment to be transferred to new Biochemistry teaching laboratory.
1. Sufficient glassware to stock all the student desks.
2. Eight (8) pH meters, 10 clinical centrifuges and 12 colorimeters. These are kept in good operating condition by making yearly replacements of defective instruments.
3. Special equipment presently on hand: (2) Beckman DB spectrophotometers, (3) Polarimeters, (6) Fraction collectors, (4) Recorders, (2) Electrophoresis apparatuses, (1) Scanner for electrophoresis strips, (3) Shaking water baths, (4) Constant temperature incubators, (1) Flow-through calcium electrode, (12) Chromatography chambers, (4) Vortex mixers, (4) Magnetic stirrers, (1) Cabinet for viewing chromatograms.

Pediatrics Laboratory Equipment

CONDITION OF EQUIPMENT
(continued)

This statement on the condition of the pediatrics laboratory equipment pertains only to those laboratories to be moved to Building A. In general, the condition of the instruments is variable from one laboratory to another. Few new instruments have been added in recent year, therefore several of these are desparately needed. These include a Coulter counter, high voltage electrophoresis apparatus, Technicon for processing paraffin blocks, atomic absorption spectrophotometer and automatic Gilson recording spectrophotometer.

Many instruments purchased within the past ten years are in good condition but are used 100% time. There is a real need for additional instruments. These include two liquid scintillation counters, two Sorval preparative centrifuges, two gas-liquid chromatographs and one Beckman amino acid analyzer and one thin-sectioning ultra-microtome.

Several instruments are in need of replacement. These include two Beckman DU spectrophotometers, a DK-2 recording spectrophotometer, a Farrand fluorometer, a Spinco analytical ultra centrifuge, three International centrifuges, and a Nuclear-Chicago well counter and scaler.

Medicine: Condition of the existing equipment to be located in the new building is reasonably good. It is expected that the equipment which has become obsolete or unusable during the next four years will be replaced with the new equipment purchased from Departmental funds.