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UNIVERSITY OF
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CATALOG

University of Missouri-Columbia
School of
Medicine



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UNIVERSITY OF MISSOURI-COLUMBIA CATALOG (USPS 651-280)

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To Present and Future Physicians:

Health is the most prized of all human possessions. Without it the ability to enjoy other aspects of life is dimmed or destroyed. A sacred trust has been given to those who enter health professions to do all within their power to restore people to good health and to a useful role in society.

The responsibility of the University of Missouri-Columbia School of Medicine is to assist the provision of health care for Missourians through the education of candidates for the health profession. The entire organization of the medical school, the ancillary programs and the hospital and clinics focuses on care for Missourians and the educational process.

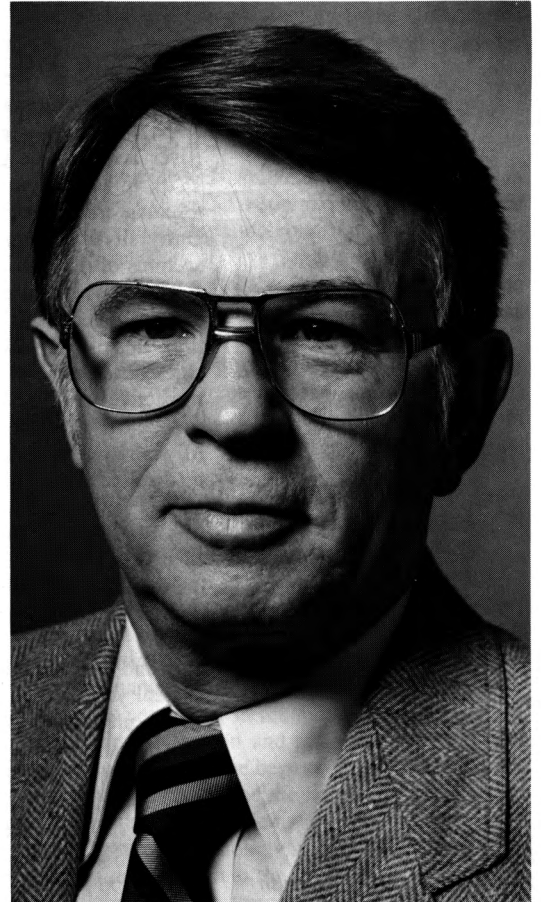
The need for well prepared men and women in health professions is a growing concern, and the University of Missouri is dedicated to the resolution of this problem. High motivation is of great importance; high academic competence is also necessary.

Lack of funds should not be a deterrent. Loan funds and scholarships are available for students with significant need. No student in recent years has left medical school for financial reasons. Qualified candidates should apply for admission and seek information about financial assistance.

This catalog will answer many questions, however, if additional information is required, please write our office for immediate response.

W.D. Bradshaw, MD

William D. Bradshaw, MD
Interim Dean, School of Medicine



GENERAL INFORMATION

The University of Missouri is one university with four campuses—Columbia, Kansas City, Rolla and St. Louis. Established in 1839 at Columbia (the oldest and largest of the four campuses), the University is recognized as the first state university west of the Mississippi River and was designated a land-grant university in 1870. In addition to its traditionally assigned tasks of teaching and research within the campus settings, the University has extended its educational benefits to all sections of the state.

The University is governed by the Board of Curators. The president of the University and his staff coordinate programs of all four campuses. The chancellors are the chief academic and administrative officers for their respective campuses.

Medical education offered by the University of Missouri began in 1841 with the establishment of a medical school affiliated with Kemper College in St. Louis. This was the first medical school west of the Mississippi river. The affiliation continued until 1855.

In December 1982 the Board of Curators approved the founding of a School of Medicine in Columbia and classes began in February 1873. For most of its first century, the school offered a basic science program only and students transferred to other schools for their clinical years.

The present educational program dates from 1956 which marked the opening of the University of Missouri-Columbia health sciences complex, composed of a teaching hospital, outpatient clinics, facilities of the School of Medicine and School of Nursing, and research laboratories where faculty and students work together on projects. At the time the curriculum of the School of Medicine was expanded to the full four-year program, and medical education at UMC moved into a new phase.

The focus of the medical school and hospital is health care for Missourians and education of health professionals.



In its first 25 years, the health sciences complex has been characterized by consistent growth, not only in greatly expanded facilities but also in depth. The best teachers, the most qualified students, the most skilled and enthusiastic hospital personnel have been sought. Patient care and teaching programs have been continually expanded and enhanced.

One hundred and ten medical students are admitted to the entering class. There are approximately 450 undergraduate and graduate nursing students, and nearly 600 students are enrolled in the health-related professional programs.

Residency training is offered in 21 medical specialties, and numerous programs are offered in continuing education for practicing physicians.

Location of the School of Medicine on the Columbia campus of the University makes numerous interdisciplinary programs possible. There are 17 schools and colleges on campus; approximately 1,700 undergraduates from other departments attend health-related classes at the health sciences complex. Graduate programs are offered in anatomy, biochemistry, microbiology, pathology, pharmacology, physiology, community medicine, and health services management; and graduate students in social work, speech pathology, medical psychology, nutrition, and special education take part of their clinical training at the health sciences complex.



HEALTH SCIENCES COMPLEX FACILITIES AND AFFILIATIONS

Three multimillion dollar additions to the original health sciences complex were completed within the first 13 years of its existence, primarily adding classroom and laboratory space for medical students. The newest five-floor addition, completed in 1969, includes multidisciplinary laboratories - each laboratory accommodates 16 medical students - where second-year students find valuable small-group instruction and integrated interdepartmental educational programs. In 1981 the medical school annex was completed. This space includes both multidisciplinary laboratories and a large gross anatomy laboratory for first-year students. Within these laboratories personal office and laboratory space is available to each student 24 hours a day. The study-stations have their own separate instructional systems, including audio tape, videotape, slides, closed-circuit television receiver and facilities for computer-assisted instruction.

The **School of Medicine** directs all medical student teaching and residency training programs in the clinical facilities of the health sciences complex. A physician staff of 180 members of the School of Medicine faculty and 215 residents are responsible for patient care and student teaching.

The **health sciences complex** is comprised of the University of Missouri-Columbia (UMC) Hospital and Clinics and the Schools of Medicine, Nursing and Health Related Professions. The complex also includes the Mid-Missouri Mental Health Center and the Harry S. Truman Memorial Veterans Hospital.

The **UMC Hospital and Clinics** is a 495-bed facility, with a professional and support staff of 2500 people, offering primary through tertiary levels of patient care. The greatest share of medical student clinical experience is gained at the UMC Hospital and Clinics, but two adjoining hospitals provide additional educational experience.

The 87-bed **Mid-Missouri Mental Health Center**, opened in 1967, provides intensive treatment for psychiatric patients. The *Harry S. Truman Memorial Veterans Administration Hospital*, opened in 1972, plays an integral role in patient care, education and research activities. The Veterans hospital is connected to University hospital by an underground passageway.

Several other health institutions in the state further enhance the medical teaching program, each selected for its unique contribution to student education. Present affiliations include Ellis Fischel State Cancer Hospital and Woodhaven Home in Columbia; Audrain Medical Center in Mexico, Mo.; St. John's Mercy, Deaconess and Missouri Baptist hospitals in St. Louis; Missouri Chest Hospital in Mount Vernon, Mo.; and Callaway County Hospital, Fulton, Mo.

The health sciences complex houses research laboratories for members of the medical school faculty, who often collaborate with researchers from other University schools and departments. Projects of mutual interest may involve nutrition, agriculture, veterinary medicine and sociology, to name just a few.

Medical school faculty also participate in projects of the Dalton Research Center, and research center staff members are active in the teaching program at the health sciences complex. A Microcirculatory Systems Research Group at Dalton recently acquired laboratory equipment unique in the world, promising to become the focus of international attention.

Another related research facility is the University's 10-mega-watt nuclear reactor center which provides laboratories for health-related studies.

UMC HOSPITAL AND CLINICS FACILITIES AND SERVICES

In 1978, the UMC Hospital and Clinics launched an extensive renovation and modernization program. Since that time, remodeling and expansion have been completed in medical records; the neonatal, surgical, thoracic, coronary and burn intensive care units; the majority of patient floors; and the emergency center; as well as lobbies and waiting areas.

The **Institute of Ophthalmology**, dedicated to the integration of basic research and clinical science in teaching and patient care, opened adjacent to the main hospital. An eye research center will be added in the near future.

The **Cosmopolitan International Diabetes Center**, opened in 1983, brings together patient care, professional education and research. The \$900,000 diabetes center occupies about 9,500 square feet.

The UMC Hospital and Clinics offer progressive, comprehensive care for rehabilitation patients at the 40-bed **Howard A. Rusk Rehabilitation Center**. The center was named to honor the Missouri graduate and world-renowned leader in rehabilitation medicine.

Continuing expansion and renovation at the UMC Hospital and Clinics have been accompanied by equipment acquisitions enabling the hospital to maintain its regional leadership in patient care.

State-of-the-art technology in computer-linked diagnostic equipment, such as the latest CT scanner and an endothelial-specular microscope, as well as instruments for sophisticated laser therapy and surgery, demonstrate the hospital's commitment to scientific innovation. Modern renal and cardiology facilities support pioneering work in ambulatory peritoneal dialysis, cardiac balloon catheterization and implantable defibrillators, placing the UMC Hospital and Clinics at the forefront of medical care.

In 11 outpatient clinics, including a **Family Medical Care Center**, physicians deliver care in more than 25 medical specialties. Among the services and units available at the Hospital and Clinics are ambulatory surgery; a full range of intensive care facilities, including the highest level of neonatal and burn intensive care units; replantation and transplant services; clinics for birth defects and developmental assessment, cerebral palsy, cystic fibrosis, pain and biofeedback therapy; an infant development unit; a new outpatient radiology department; centers for arthritis, diabetes and Parkinson's disease; and a spinal cord injury treatment program.

The UMC Hospital and Clinics is mid-Missouri's only **Level I Trauma Center**. To earn this designation the hospital has met more than 100 requirements established by the American College of Surgeons and has demonstrated a commitment to comprehensive care of trauma patients 24 hours a day. Staffed by a trauma team, the emergency center contains 11 treatment rooms including private exam rooms, two fully equipped trauma rooms and a cast room.

Paramedics staff University ambulances and may accompany specially trained flight nurses aboard the Helicopter Emergency Care Service. Since 1982, the

Columbia is fast gaining a reputation as a regional health care center. The state of Missouri is our "community".

Hospital and Clinics have operated a helicopter service to deliver skilled critical care nurses and medical equipment to accident scenes or community hospitals for transport of critically ill or injured patients. Flight nurses maintain treatment during patient transport to the hospital, and a sophisticated communications center keeps the flight crew in constant touch with the emergency center staff.

The hospital is also a regional Poison Control Treatment Center, providing computer-linked access to immediate information on poison treatment.

Optimum use of facilities and a broad spectrum of patient cases is ensured through statewide referral patterns. Patients may be referred by a family physician or by another health agency, or they may seek care at the Hospital and Clinics on their own.

During the past year, hospital admissions totaled more than 13,000, with outpatient clinic and emergency room visits adding an additional 150,000 visits. More than 1,100 births were recorded, and nearly 6,500 major surgical procedures were performed.

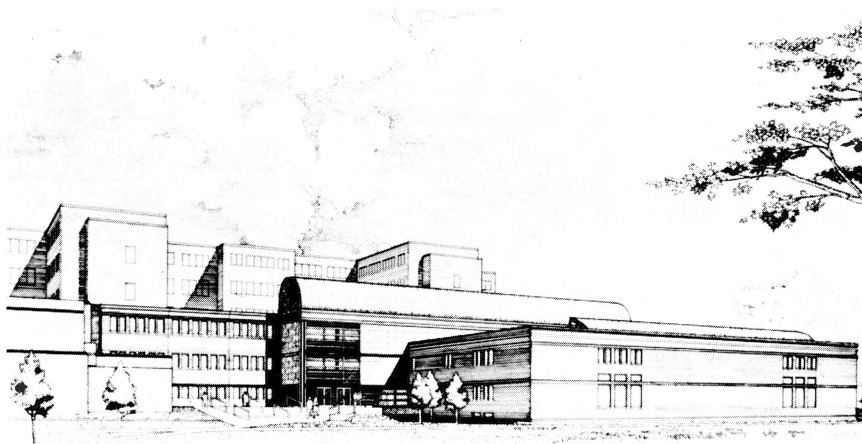
HEALTH SCIENCES LIBRARY

The Health Sciences Library, located in the wing which joins the University Hospital with the Medical Sciences Building, has a collection of more than 140,000 volumes and regularly receives about 1,900 journals and most of the indexes and abstracts pertaining to medicine and related fields. It provides for the library needs of the entire health sciences complex including the School of Medicine, School of Nursing, School of Health Related Professions, and the graduate and undergraduate programs in the basic medical sciences. MEDLINE and other data base searching is available.

The open stack library is available to the entire UMC community. It is part of the UMC library system which consists of Ellis Library and eight subject-specialty libraries. Medical students, graduate students and residents have full access to all library facilities on campus. Material that is not available locally is secured through interlibrary loan.

A new Health Sciences Library is under construction and is expected to be completed Summer, 1985.

As viewed from the A & S Mall, the new library will feature an atrium linking the library to the School of Medicine addition and the School of Nursing.



STUDENT GROUPS AND PROJECTS

The **Student Affairs Council (SAC)** functions as an advisory group to the dean on policy matters involving students and student-faculty interrelations. The SAC membership includes class presidents, the AMSA, AMWA, and SNMA presidents, representatives of other student organizations and specifically designated SAC representatives elected by each class. The chairman of SAC is elected by school-wide ballot. Invited faculty members serve as consultants.

The local chapter of the **American Medical Student Association (AMSA)** sponsors a variety of medical, social, and cultural events; seminars, intramural athletics and faculty home visits are among AMSA activities.

A chapter of the **Student National Medical Association (SNMA)** is actively pursuing its goals to increase minority enrollment and to raise the level of consciousness in the community with respect to minorities' health care needs. Recruiting qualified applicants and conducting community health education programs are among SNMA activities. Members also consult with the campus minority pre-med organization.

A junior chapter of the **American Medical Women's Association** was chartered at UMC in 1974 to increase awareness of issues facing women in medicine and to provide encouragement and advisement for female students. Programs on humanistic issues are regularly offered.

An **Honor Council** composed of elected representatives of each class administers the honor code. This code, written by the student body during the early 1960s was revised in 1970 and again in 1982.

The yearbook **MUtion** is produced annually by a student staff.

STUDENT RESEARCH DAY

As a means of recognizing student research projects of unusual excellence, a Biomedical Student Research Symposium is an annual part of medical school activities.

Medical students and others in the biomedical sciences present brief reports of their research before assembled faculty and students and defend their presentations in the discussion which follows. Those individuals considered to have presented the best papers subsequently represent the University at national research forums. In recent years, several Missouri students have won national recognition at these scientific meetings.

ALPHA OMEGA ALPHA

In 1957, a chapter of Alpha Omega Alpha, the national honorary medical society, was established at the UMC School of Medicine. The society is composed of faculty, house staff and outstanding junior and senior medical students.

As a means of recognizing and promoting academic excellence, the society sponsors the annual AOA lecture, presentations on leaders in medicine, and seminars on current issues in medicine.

APPLICATION AND ADMISSION

Persons contemplating a career in medicine should establish a sound foundation in the natural sciences, the social sciences, and the humanities and should demonstrate facility in writing and speaking the English language. The School of Medicine strongly recommends a broad liberal arts program leading to a baccalaureate degree.

REQUIREMENTS FOR ADMISSION

An applicant must have at least 90 semester hours (exclusive of physical education and military science) from a recognized college or university. The following course work is required:

Semesters

- 1 General biology or zoology (with lab)
- 2 Other biology (with lab)—may include comparative anatomy, embryology, genetics or others
- 2 Inorganic chemistry (with lab)
- 2 Organic chemistry (with lab)
- 2 General physics (with lab)
- 2 Mathematics—algebra, calculus, statistics or trigonometry
- 2 English composition and literature

Courses which overlap medical school course work should be avoided unless these courses are an integral part of the applicant's undergraduate program.

The Medical College Admission Test is required. Applications and requests for information about this test should be sent to MCAT Registration, American College Testing Program, P.O. Box 414, Iowa City, Iowa 52240.

Every applicant must submit a letter of recommendation from his/her premedical advisory committee. Where no premedical advisory system exists, the applicant must submit letters of recommendation from three professors who have known the applicant in a

teacher/student capacity. Nonacademic and personal letters of reference also are helpful to the admissions committee. Letters of recommendation should be mailed directly to the director of admissions, School of Medicine.

A personal interview is required for admission.

THE APPLICATION PROCESS

Two publications provide material helpful to medical school applicants: this *Catalog*, which is available from the Admissions Office, School of Medicine, M222 Medical Sciences Bldg., Columbia, Mo. 65212; and the *Medical School Admission Requirements*, which is available from the Association of American Medical Colleges, 1 Dupont Circle N.W., Washington, D. C. 20036.

The School of Medicine uses the centralized application service, American Medical College Application Services (AMCAS), 1776 Massachusetts Avenue N.W., Washington, D.C. 20036. Applicants should request an AMCAS application request card and a current *School of Medicine Catalog* from the Admissions Office. Application may be made through AMCAS after June 15, but not later than November 15, for the following academic year.

The Committee on Admissions, composed of faculty members and medical students, each year selects an entering class of 110 students. Preference will be given to Missouri residents; a very limited number of positions are available for non-residents. Based on the AMCAS application and letters of recommendation, approximately 70 percent of the applicants are invited for interview. Both academic qualifications and nonacademic attributes are important in the selection process. A successful applicant usually has a grade point average above 3.35 (A = 4.0). The MCAT scores provide some indication of an applicant's aptitude for medical studies.

Admissions Office, School of Medicine, M-222, 882-2923
Office of Student Affairs, M-222, 882-2923
Financial Aids, 11 Jesse Hall, 882-7506
Cashier's Office, 123 Jesse Hall, 882-3098
Housing Information, 123 Jesse Hall, 882-4031

FEES AND EXPENSES

The University reserves the right to change fees at any time. UMC attempts to keep required fees at a minimum. The following schedule lists fees and estimated expenses of an instate unmarried student for 1983-84.

First Year (Aug.-May)

Tuition	\$4,240.
Includes UMC incidental fee, medical school supplemental fee, and student activities fee.	
Supplies, Books, Instruments	980.
Living Expenses	4,590.
Includes (off-campus) rent and utilities, food, transportation, clothing and personal items, laundry, insurance and recreation.	
Total Estimated Fees & Expenses	\$9,810.

Second Year (Aug.-May)

Tuition	\$4,240.
Supplies, Books, Instruments	600.
Living Expenses	4,590.
Total Estimated Fees & Expenses	\$9,430.

Third Year (June-May)

Tuition	\$4,770.
Supplies, Books, Instruments	450.
Living Expenses	6,510.
Total Estimated Fees & Expenses	\$11,730.

Fourth Year (June-May)

Tuition	\$4,670.
Supplies, Books, Instruments	150.
Living Expenses	7,150.
Includes travel expenses for interviewing	
Total Estimated Fees & Expenses	\$11,970.

Detailed information on fees and expenses, including supplemental fees is furnished in the Schedule of Courses.

Refund of Academic Fees. Subject to certain exceptions and upon receipt of a written request to the manager of cashiering, students leaving school or dropping courses for which they have paid fees will receive a refund. Refunds are paid in accordance with the following schedule:

Time of Withdrawal	Percent Refunded
16-week Semester	
Before day	100% (less \$20 cost)
classwork begins	of handling registration)
1st through 5th day	90%
6th through 10th day	70%
11th through 25th day	50%
After 25th day	No Refund

Refund of Housing Fees. University room and board charges and the contract deposit are refunded in accordance with the terms of the contract.

The Committee on Admissions also seeks to assess such attributes as motivation, maturity and leadership ability. Demographic factors also are considered. The entering class typically shows a wide range of undergraduate fields of concentration.

The School of Medicine participates in the AMCAS Early Decision Plan (EDP). This plan permits an applicant to file a single application, prior to August 1, and guarantees that the applicant will receive an early decision, prior to October 1, by that school. As EDP applicants are interviewed, the Committee on Admissions places each applicant in one of three categories: accept, hold status or reject. Any applicant not accepted as an early-decision candidate may be considered by other schools as a regular candidate.

It is important to understand that applicants who opt for early decision may not apply to any other U.S. medical school during the time their credentials are being considered for early decision. If admitted to an early-decision school, the applicant must then attend that school.

SPECIAL PROGRAMS FOR NONTRADITIONAL STUDENTS

A number of racial and socioeconomic groups are currently underrepresented in the medical profession. Applications from these nontraditional students are reviewed carefully. Such students are encouraged to review the chapter, "Information for Minority Group Students" in *Medical School Admission Requirements*. Such students also may wish to submit their names to the Association of American Medical Colleges Medical Minority Registry (MED-MAR) and review the fee waiver offered by AMCAS.

The Committee on Admissions seeks to identify minority, disadvantaged and other nontraditional applicants. Disadvantaged students may attend a prematriculation academic enrichment program. Some students are offered the option of a five-year program.

SUPPORT SERVICES

The School of Medicine's Office of Student Affairs provides a variety of individual and group counseling and consulting services to students and student organizations. Services offered include academic, financial and personal counseling, as well as workshops on test taking, memorization, study skills, and speed reading and learning. A full range of psychological services is available from the University Counseling Service.

FINANCIAL ASSISTANCE

The School of Medicine has a financial aid program to supplement various federal loan programs. Approximately 75 percent of the student body receive aid from this program. The applicant's financial status plays no part in the admissions process.

LOAN FUNDS

Federal Insured Student Loan (FISL) and Missouri Guaranteed Student Loan (MGSL): These are special bank loans, generally through the student's or parents' bank, in which the federal government pays the interest until graduation. Financial aid applicants, in general, must seek such aid before other aid is granted. These loans are for those students who have demonstrated

financial need.

Robert Wood Johnson Fund: Limited funds are available for women, ethnic minorities, and persons from rural backgrounds who have financial need.

M. Pinson Neal Loan Fund: Established by the Medical School Foundation.

Health Professions Student Loan Fund (HPSL): Under this program federal money is provided to the University to aid deserving students in meeting educational costs. The loans are based on financial need and are repayable, at low interest, within ten years after completion of internship and residency.

National Direct Student Loan (NDSL): Under this program federal money is provided to the University to aid deserving students in meeting educational costs. The loans are based on financial need and are repayable, at low interest, beginning upon completion of medical school.

Health Education Assistance Loan (HEAL): A loan fund, generally through a New York bank, in which the interest (3 percent above the Treasury Bill rate) is compounded from the date of the loan. These loans are available without demonstration of financial need.

Missouri Parents Loan Program (MPLUS): A loan fund, generally through Missouri banks, in which the interest is payable while attending school and repayment begins upon graduation. These loans are available without demonstration of financial need.

Missouri State Medical Foundation: A loan fund established in 1961 and supported by the Missouri State Medical Association is available to Missouri residents.

University of Missouri Medical School Foundation: A perpetual non-profit corporation whose purpose is to promote and further medical education in Missouri.

Greene County Medical Society Loan Fund: A loan fund supported by the Greene County Medical Society; preference to residents of Greene County.

Raymond A. McCanse Memorial Fund: Provides short-term loans without interest.

Other emergency loan funds, including one sponsored by MUTation (the student yearbook), are available.

Applications for financial aid are made to the Office of Student Affairs, School of Medicine, or to the campus Student Financial Aid Office, 11 Jesse Hall.

SCHOLARSHIPS

Federal Armed Forces Medical Scholarships: Accepted or enrolled medical students are eligible to apply for these scholarships through application to the Surgeon General of the Army, Navy or Air Force. Students accepted to the program receive military junior officers' pay plus reimbursement for medical school educational costs. For each year medical students participate in the program they must commit one year to the appropriate military service.

National Health Service Corps Scholarships: Scholarships similar to those for the armed services are available (on a very limited basis) based on contractual arrangements to serve in the Public Health Service, including the National Health Service Corps.

Curators' Scholarships: Accepted applicants (who are Missouri residents) of unusual promise as medical students and physicians are selected to receive a complete or partial waiver-of-fees equal to the incidental and the supplemental fee for the first two semesters.

Joseph Collins Foundation: A limited number of

national scholarships are awarded each year. Each school may submit a nominee for the award which provides a maximum of \$1,500 yearly.

National Medical Fellowships: Minority students often obtain support for their early years in medical school through this foundation.

Southern Medical Association Scholarships: One or two first-year students are selected each year to be recipients of this scholarship in the amount of \$375. Recipients are selected on the basis of excellence in scholarship.

Elmer C. Peper Scholarship: Approximately 40 first-year students are selected to receive this scholarship, generally in the amount of \$1,000. Recipients are selected on the basis of financial need and must be Missouri residents.

Fulbright-Swyers Foundation Scholarship: Each year several medical students are selected to receive this scholarship. Applicants must be Missouri residents and preference is given to students from southwest Missouri.

AWARDS

Women's Auxiliary to the Boone County Medical Society: Two cash awards are made annually to one outstanding second- and fourth-year medical student based on academic excellence.

Russell D. Shelden Award in Anesthesiology: One or two awards are made annually to students who have demonstrated outstanding achievement in the anesthesiology service.

Anatomy Department Award: An award presented annually to the outstanding student in anatomy.

Medical Biochemistry Award: A book award is presented each year to a first-year student who has done outstanding work in medical biochemistry.

Neuroscience I and II Award: An award presented annually to the outstanding student in Neuroscience I and II.

Pharmacology Honors Award: An award is made annually to the second-year student who has done outstanding work in pharmacology.

Microbiology Award: A book award is presented annually to the outstanding student in microbiology.

Dean's Award: An annual award made to the fourth-year student for outstanding achievement in academic and clinical proficiency.

Missouri State Medical Association Award: An award of \$100 and a scroll are given to an outstanding medical student in each graduating class.

Student Leadership Award: An annual award for student leadership is given each year at graduation. The recipient is selected by class members.

Robert L. Jackson Award: An award is made each year to a graduating student who had demonstrated outstanding performance in pediatrics.

Family Practice Award: One or two awards are made to graduating students each year for outstanding performance in family practice.

Internal Medicine Award: A graduating senior is recognized each year for outstanding performance in internal medicine.

Fred B. Kyger Award: An award is made annually to a senior student who has achieved outstanding work in obstetrics/gynecology.

Radiology Department Award: An award is made annually to a senior student who has done outstanding work in radiology.

Parker B. Francis Award: An award is made annually to a senior student who demonstrates outstanding achievement in anesthesiology.

John Buessler Award: An award made annually to a graduating senior for excellence in ophthalmology.

Psychiatry Department Award: An annual award made to a graduating student for outstanding achievement during the psychiatry clerkship.

Department of Surgery Award: An award made to a graduating senior for outstanding achievement in surgery.

Elfriede Tachman Memorial Award: An award is made each year to a graduating senior who has demonstrated exceptional qualities of responsibility and devotion in the compassionate care and understanding of the sick.

STUDENT FELLOWSHIPS

A limited number of fellowships are made available by grants from the National Institutes of Health, voluntary health agencies and other groups to encourage research which contributes to the student's training and development as a physician.

Each year several first- and second-year students are invited to spend a fellowship year in one of the preclinical departments, working closely with a faculty member and participating in activities of the department. Similarly, during the clinical years, students frequently accept departmental fellowships during their free blocks.



COURSE OF STUDY

The goal of the educational program is to help the medical student acquire a basic fund of knowledge, to learn those skills and attitudes essential in all physicians, and to encourage an inquiring mind.

The faculty places high priority on giving students a great deal of responsibility for their own educational progress. The curriculum offers flexibility in terms of combined-degree programs (see below), course projects, and the sequence of clinical clerkships. The faculty further has recognized the value of small group instruction and an integrated interdepartmental educational program.

During the second year, each student is involved in selecting a sequence of clinical rotations for the third and fourth years. Major emphasis is on freedom for students to vary their curriculum, recognizing the variance in learning styles, previous educational experience and future goals.

Research and the scientific experiment have become an integral part of the teaching techniques of the medical school since it is essential that the well-prepared

physician must not only be acquainted with current medical knowledge but also must have the capacity to accept and synthesize a vast complex of new information as it becomes available. Most students use free blocks for further clinical and research experience.

To ensure that our educational program is comprised of content necessary for competency, the program is reviewed annually and may be modified. Currently, the four-year curriculum is as follows (contact hours in parentheses):

FIRST YEAR

First Semester Aug.-Dec.
Gross Anatomy (180)
Embryology (45)
Biochemistry (195)
Social and Behavioral Science (60)
Second Semester (Jan.-May)
Histology (120)
Physiology (180)
Social and Behavioral Science (45)
Introduction to Clinical Medicine (15)
Neuroscience I (120)

SECOND YEAR

First Semester Aug.-Dec.
Microbiology (180)
Pathology (180)
Introduction to Clinical Medicine (90)
Social and Behavioral Science (30)
Second Semester (Jan.-May)
Pathology (174)
Pharmacology (131)
Introduction to Clinical Medicine (90)
Radiology (15)
Social and Behavioral Science (15)
Neuroscience II (40)

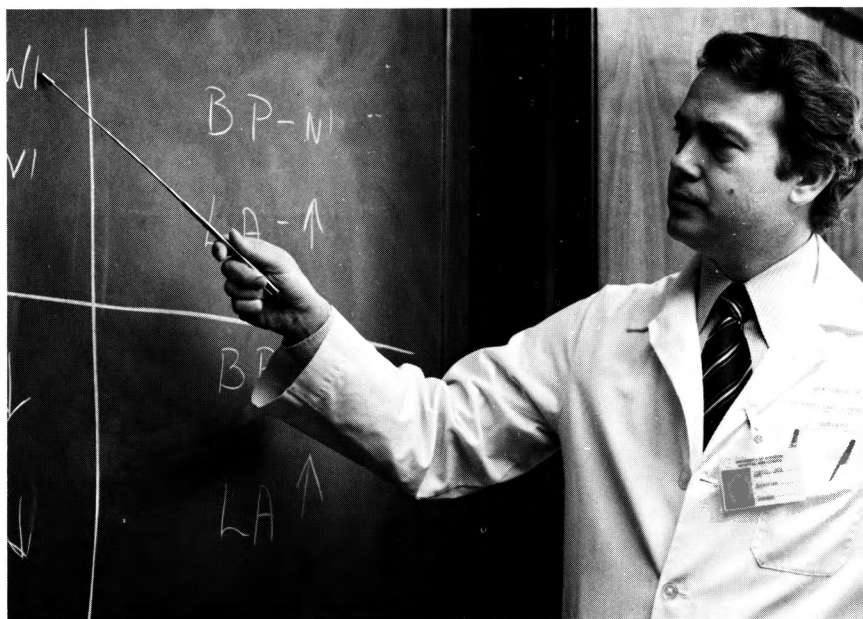
THIRD AND FOURTH YEARS

A two-year sequence commences in June following the second-year coursework. Required blocks include:

Medicine - 12 weeks
Surgery I - 8 weeks
Surgery II - 4 weeks
Child Health - 8 weeks
Psychiatry - 8 weeks
Obstetrics-Gynecology - 8 weeks
Neurology - 4 weeks
Family Medicine Preceptorship - 4 weeks
Elective - 16 weeks
Free time - 24 weeks.

The preceptorship, sponsored by the Department of Family and Community Medicine, provides each student the opportunity to share in the role of a practicing physician in a small community. Student response to this program has been enthusiastic. It provides experience with the practice of medicine outside an academic setting.

The elective block is to be spent in some educational pursuit. Numerous opportunities exist, both at the health sciences complex and at other institutions. The free time blocks may be spent in any way a student chooses. Most students spend part of this time in further clinical experience, including studies abroad; some students participate in research programs at the health sciences complex. Others enroll in graduate degree programs at the University.



EVALUATION, PROMOTION AND GRADUATION

The School of Medicine currently uses an honors/pass/fail grading system, supplemented by narrative commentary from faculty. Students are required to pass the National Board of Medical Examination (NBME) Part I for promotion to the clinical years and NBME Part II for graduation, as well as the satisfactory completion of the required courses. The Committee on Student Promotions, composed of students and faculty members, is responsible for reviewing performance. The faculty of the School of Medicine, responsible for awarding the MD degree, recognizes that candidates for the degree must demonstrate both academic and personal qualities of a competent physician.

An MD-PhD program is available for the student seeking a research career. After acceptance into medical school, students must be accepted by the graduate program of their choice. A minimum of two additional years are to be worked into the medical curriculum to satisfy requirements for the PhD.

PhD programs are available in anatomy, biochemistry, microbiology, nutrition, pharmacology, physiology, psychology, pathology and medical sociology with School of Medicine faculty and in various other disciplines of other colleges and divisions of the campus.

Fellowship support may be provided for the PhD portion of this program while loan and scholarship funds may be available for the MD curriculum, based on need.

Inquiries concerning combined degrees should be made to the Student Affairs Office, School of Medicine.

RESIDENCIES & GRADUATE FELLOWSHIPS

All residency training programs at the UMC health sciences complex are accredited by the national accrediting groups. Refer to the section on Residency Training Programs in this *Catalog* for details.

A limited number of fellowships are available in the clinical departments for postgraduate study beyond the residency level.

OFFICE OF CONTINUING EDUCATION & EXTENSION

Continuing education programs for many of the health professionals of the state are developed, promoted and coordinated through the Office of Continuing Education for the Health Professions. The audiences for these programs including physicians, nurses, technologists, nutritionists, health service managers, hospital pharmacists and others involved in health care.

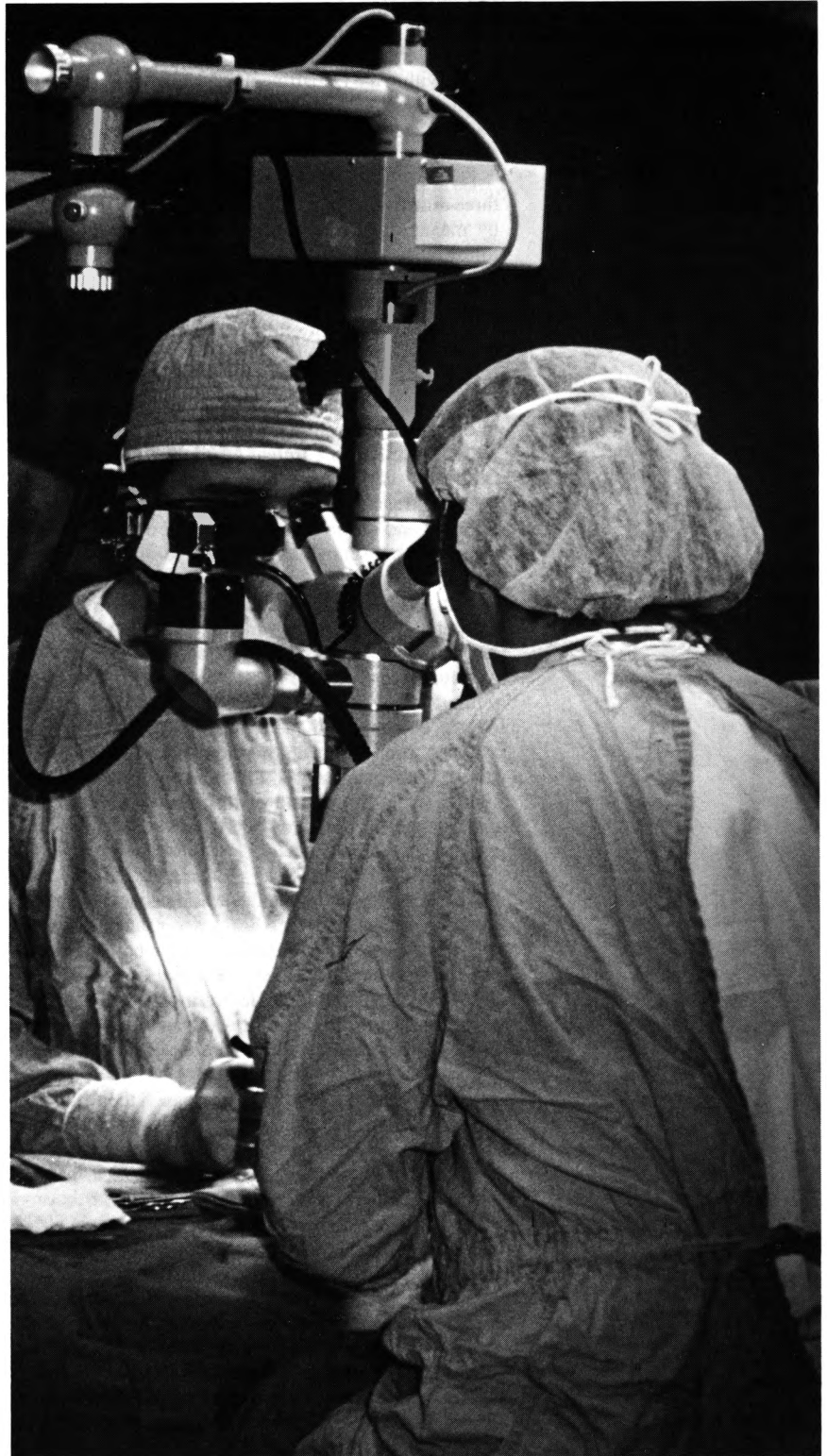
Frequent conferences and short courses are held at the health sciences complex and at other locations in Missouri. Faculty visits to local communities are arranged to fit the needs of the practicing professionals in those communities.

Sabbatical programs for individual practicing physicians can be arranged. In this program, a physician may spend time in a particular clinical department at University Hospital, arranging the time and curriculum by mutual agreement between an appropriate faculty member and the physician. In this way, a tailored educational experience can be developed to meet the individual physician's needs.

The School of Medicine is fully accredited by the Accreditation Council for Continuing Medical Education to sponsor continuing medical education for physicians.

For information on educational programs scheduled during the year, call 882-2256.

The surgeon-and-first-assistant approach is used with the double-ocular microscope during lengthy microvascular surgery.



DEPARTMENTS AND COURSES

INTERDEPARTMENTAL COURSES

Social and Behavioral Sciences. The social and behavioral sciences course sequence, for all first- and second-year medical students, examines issues of health, health care and health care delivery from the point-of-view of the behavioral sciences. The course sequence seeks to develop awareness of factors which account for the interaction and continuity in human life, health and disease.

The course is coordinated by the behavioral science group within the Department of Family and Community Medicine with the participation of other faculty of Family and Community Medicine and other departments.

Neuroscience I & II. Neuroscience I introduces the three dimensional anatomy of the brain and spinal cord by means of a lecture/laboratory experience. This is followed by an integrated study of the functional aspects of sensory-motor systems, special senses and higher functions. Pathophysiological concepts and patient correlations are used to reinforce this material. Neuroscience II, given in the second year of medical school, focuses on pathophysiology of the human nervous system with emphasis on the problem solving approach to diagnostic neurology.

Introduction to Clinical Medicine. Introduction to Clinical Medicine is a three-semester interdepartmental course for all first- and second-year medical students.

Goals and curriculum are set by a committee composed of representatives of the Departments of Medicine, Obstetrics-Gynecology, Surgery, Child Health, Family and Community Medicine, Psychiatry, and of the student classes. The means to accomplish these goals include lectures, laboratory sessions and, in particular, teaching in small groups in the clinical setting, led by members of the hospital teaching staff.

The objective of the course is to facilitate the student's transition to a practitioner of medicine. The course introduces basic skills of recognition of clinical symptoms and signs and of formulation and management of patient problems.

ANATOMY

The Department of Anatomy offers courses to undergraduate, graduate and medical students. Courses taken by first-year medical students are developmental anatomy, gross anatomy, histology and neurosciences. Other courses are available to medical students as electives (See Statement of Courses section in this *Catalog*.) Dissection facilities are available to residents and other medical postgraduates.

Medical students who have completed their first year in the School of Medicine may apply for a two-year assistantship in the department. The assistants who are accepted spread the second year of the medical curriculum over a two-year period and graduate in five years instead of the traditional four years.

Medical students who wish to combine an advanced graduate degree with a medical degree may arrange to pursue work in anatomy. In this instance the completed course work for the first year of medicine would meet many of the course requirements of the basic graduate program. For additional information about any aspect of the graduate program in anatomy consult the *Graduate School Catalog* or write to the Director of Graduate Studies, Department of Anatomy.

ANESTHESIOLOGY

Anesthesiology is defined as a practice of medicine dealing with: (1) the management of procedures for rendering a patient insensible to pain during surgical, obstetrical and certain medical procedures; (2) the support of life functions under the stress of anesthetic and surgical manipulations; (3) the clinical management of the patient unconscious from whatever cause; (4) the management of problems in pain relief; (5) the management of problems in cardiac and respiratory resuscitation; (6) the application of specific methods of respiratory therapy; (7) the clinical management of various fluid, electrolyte and metabolic disturbances.

Student contact is established and maintained throughout the four years of medical school education.

Teaching methods are varied, comprising informal seminars, formal seminars, interdepartmental conferences and direct personal supervision of students administering anesthesia in the operating rooms.

Didactic presentations are held Monday and Friday afternoons, 48 weeks each year.

BIOCHEMISTRY

The departmental faculty teaches biochemistry for medical students along with beginning and advanced biochemistry courses for both undergraduate and graduate students. In addition to BS, MS and PhD degree programs, the department also offers combination MS-MD and PhD-MD programs. Before matriculation, applicants for the combined degree programs must first be accepted by the UMC School of Medicine. Enrollment in either the MS or PhD degree programs can also be arranged after entrance to medical school.

Research opportunities are available to students through the expanding research activities of the faculty. In particular, medical students may pursue laboratory research interests as a part of the first year biochemistry course, or during the summer following the first year, or during elective blocks. Financial assistance is available for students who choose to carry out research during the summer or through degree programs.

CHILD HEALTH

The focus of the Child Health Department is on the model of a child within a family within society. Growth, nutrition, development, mental and physical health, interviewing and patient care are the major areas of emphasis. The special emotional and physical features of infancy and childhood distinguishing children from adults are emphasized.

In the first two years the early processes of growth and development are described. In the third year appraisal of normal newborns, infants and older children, as well as intensive illness in these groups, is carried out by students. In the ambulatory setting, intensive focus is placed on optimum health maintenance, acute care needs, and consultative and continuous management of complex health problems.

The pediatric training experience base involves daily conferences, lectures, teaching rounds, admission and care of hospitalized patients, and examination of ambulatory patients. Participation in an active neonatal unit provides newborn experience.

Research activities of the department are involved with cardiology, child abuse, cystic fibrosis, diabetes, endocrinology, gastroenterology, genetics, growth,

hematology, infectious diseases, neonatology, nutrition, renology, rheumatology, and school and developmental problems.

The department is also involved in developing some programs of patient care for children in conjunction with other agencies in the surrounding areas. It also has evolved an interdisciplinary program dealing with children having multiple handicaps.

FAMILY AND COMMUNITY MEDICINE

Each undergraduate medical student rotates through a four-week preceptorship with a physician in private family practice. The medical student may take an additional preceptorship on an elective or free block.

There are four- and eight-week elective clerkships in family medicine that are operated out of the Family Medical Care Center (located within the health sciences complex) that require the student to study family practice under the supervision of the family medicine attending faculty.

Outpatient experiences under the supervision of family medicine attending faculty are also provided at the Callaway Family Medical Care Center in Fulton, Mo., and at the Fayette Medical Clinic in Fayette, Mo.

MEDICINE

The primary concern and responsibility of departments of medicine traditionally have been to teach the student to think and act like a doctor. The fundamental teaching activities and work available in this department are directed toward that goal. Those efforts begin with our role in teaching the fundamental procedures necessary for the intelligent examination of patients. Emphasis is also placed on the principles of differential diagnosis and the approach to solving the patient's problems as well as on the importance of extrapolating "basic science" information into the art of patient care. The clinical years provide actual responsible clinical experience in both outpatient and inpatient settings.

At present, the inpatient service of the Department of Medicine is comprised of two major areas, one located

in University Hospital and Clinics, consisting of approximately 120 beds. The second area is in the VA Hospital and contains a comparable number of beds. The bed areas are divided into nursing units and attending teams. Each group of approximately 20-25 patients is the responsibility of a team of senior staff attending physicians, residents and students.

Medical outpatient activities are housed in both University Hospital and Clinics and the VA Hospital.

Elective opportunities for specialized in-depth clinical and laboratory activities are also available. A student who wishes to develop such an area of concentration within the Department of Medicine is assigned a preceptor. This preceptor can guide the student's clinical work, research and other elective activities, and can be especially useful in advising the student regarding the effective use of elective time.

Each division of the Department of Medicine offers opportunities for various elective experiences: (1) advanced clinical studies in the medical clinics or on the wards; (2) clinical investigations; (3) laboratory research.

The total teaching activities of the department include first-, second-, third- and fourth-year medical students, physicians, and clinical or research fellows in formal postgraduate training programs.

MICROBIOLOGY

The Department of Microbiology is dedicated to the three major University objectives—research, teaching and service.

Faculty, post-doctoral fellows, graduate students and staff conduct research in each of the major subdisciplines of microbiology including molecular genetics, cellular immunology, pathogenesis and virology. New faculty added during the past few years have increased the breadth and depth of the department's commitment to the development of new knowledge through research. Faculty members serve as expert consultants at national and international levels. Our curricular offerings have been revised to stress the recent and ongoing developments in microbiology.

In addition to the more specialized graduate level courses, microbiology 205 is offered twice a year, primarily for students in nursing and other health-related professions. Medical microbiology 301, primarily for second-year medical school students and for graduate students, is offered every fall. This course covers the medical aspects of bacteriology, immunology, virology, mycology and parasitology, and is taught by experts in these subdisciplines. Graduate students get teaching experience along with their continuous involvement in research. Current topics of interest are discussed in departmental journal clubs and the seminar series. The latter includes presentations by prestigious biological scientists, both internal and external.

Office and research laboratories of the department are located primarily on the second and sixth floors of the Medical Sciences Building. The department is well equipped with the modern equipment essential to research. A new library is being stocked with up-to-date and pertinent references and books of interest to faculty and students. Ready access is available to other facilities such as Laboratory Animal Medicine and the Health Sciences Library. Cooperative interactions with other departments within the health sciences complex and throughout the campus also enhance the department's productivity.



NEUROLOGY

The academic activities of the Department of Neurology are primarily concerned with the student's development of certain fundamental skills in the diagnosis and treatment of disease of the nervous system.

Fundamental to the acquisition of skills in clinical neurology is a firm foundation in the basic sciences of neurology: anatomy, biochemistry, physiology, pharmacology and pathology. The Department of Neurology participates in the teaching of these basic sciences during the first two years of medical school. The techniques of neurological examination and diagnosis are taught in the Introduction to Medicine course. Didactic and bedside teaching are provided during the required medical-surgical neurology clerkship in the fourth year.

Elective clerkships allow participation in the care of hospitalized patients on the Neurology Consultation Service and in specially arranged elective experiences in research, EEG, EMG, etc.

OBSTETRICS AND GYNECOLOGY

The program in obstetrics and gynecology is designed to provide a thorough experience for the medical student, resident or postgraduate physician in human reproductive biology, normal and abnormal obstetrics, clinical gynecology, gynecologic endocrinology, gynecologic oncology and gynecological surgery.

Student teaching is integrated through a four-year interval. An elective experience is offered to freshman medical students in basic human reproductive biology. During the sophomore year, participation in correlative courses is directed at reinforcement of knowledge of human reproductive physiology and its relationship to normal obstetrics. Clinical obstetrics and gynecology is scheduled during the final 24 months of medical training and provides experience for the student in normal and abnormal obstetrics and clinical and operative gynecology.

Teaching methods vary from informal discussion, laboratory research, lectures and interdepartmental conferences to graded assignments of patient responsibility.

OPHTHALMOLOGY

There are two main areas of concern in the teaching of ophthalmology. The first of these has to do with the intrinsic diseases of the eye which may lead to blindness; the second concerns examination of the eyes as a reflector of systemic disease. In the first instance we have an obligation to make sure that the general physician is properly aware of those diseases and conditions which threaten vision. In the second instance we must provide the physician with those powers of observation which make the examination of the eye an indispensable part of the general physical examination and evaluation. Changes in the eye accompany a great variety of physiologic and pathologic changes of all organ systems. Some of these have highly specific diagnostic value and become powerful tools for the general physician.

The teaching of ophthalmology is interdisciplinary and must take place at each step of the medical curriculum, beginning with the basic sciences. The

technique of ophthalmoscopy is taught during the course Introduction to Medicine. Small group conferences and teaching at the bedside on the wards of Medicine and Pediatrics, as well as in the Outpatient Clinic, continue throughout the third and fourth years.

An elective is provided for those students who wish to acquire more clinical or research experience.

The department has well-equipped clinical and surgical facilities which provide for all the recognized subspecialty activities of ophthalmology. A unique patient population makes clinical research possible in a wide variety of areas. Laboratory research facilities center at the Missouri Eye Research Foundation, a fully affiliated organization located in Columbia.

PATHOLOGY

Pathology is often referred to as "the bridge between the basic sciences and clinical medicine." The Department of Pathology has responsibilities not only in the education of medical students but also undergraduate students preparing for the various health-related professions, graduate students working toward MS or PhD degrees, and physicians taking postgraduate work toward qualification as specialists in residency programs. Undergraduate groups for which the department assumes a major responsibility are the medical technology, cytotechnology and histotechnology students. In addition, a non-degree educational program for preparation for the Specialist in Blood Banking certification is offered to qualified registered medical technologists.

For medical students, the department is responsible for teaching general pathology, systemic pathology and clinical pathology. General pathology involves the basic mechanisms of disease, including such things as inflammation and repair, infectious disease and neoplasia. The study of organ systems, in which the diseases of each body system are systematically covered, is the subject of systemic pathology. In clinical pathology, the application of clinical laboratory procedures to the assessment of human disease is studied. In teaching pathology, considerable emphasis is devoted to integrating the subject matter with what the student learns in anatomy, biochemistry, physiology and clinical medicine. In general, this is achieved by teaching via the case study method. During the second semester, special cases are studied and discussed in conjunction with several other courses.

PHARMACOLOGY

A course in pharmacology is included in the medical student's schedule during the fourth semester. The purpose of the course is to provide a background in the science of pharmacology sufficient to prepare the student for transition to the clinical years of medical study or advanced study in the graduate school. Special emphasis is placed on actions, mechanisms of action, therapeutic uses and toxicological manifestations of selected drugs from the major groups of therapeutic compounds.

The objective of instruction in medical pharmacology is to produce physicians who will prescribe drugs intelligently for the benefit of their patients. The course in medical pharmacology is not one in practical therapeutics with primary emphasis on drug therapy in clinical medicine, since the student is not yet experienced in the clinical sciences.

PHYSICAL MEDICINE AND REHABILITATION

Conventional and curative medical resources, while essential to physical medicine and rehabilitation, are not sufficient for the management of those disease processes which result in loss or defect in normal human function such as mobility, self care and communication skills. Such defects limit personal, social, recreational and economic activities. The patient's needs may be so broad that, in addition to applying specialized clinical medical skills, the program in physical medicine and rehabilitation must incorporate the contributions of many medical, medically related and behavioral sciences in the restorative process.

Educational programs in the department include: residency training program; clinical training in other health-related programs; and continuing education for the health professions.

Medical students are offered a four-week supervised clinical elective during their third or fourth years. A three-year residency training program leading to board eligibility is currently provided for two residents a year.

Also within the department, clinical training is offered in social work, vocational rehabilitation counseling, recreation therapy, speech pathology, audiology, rehabilitation nursing and psychology. Recently enlarged clinical facilities for all training programs are available in University Hospital and Clinics and the adjacent Rusk Rehabilitation Center.

The department is comprised of a unique pattern of elements drawn from several scientific and medical disciplines; thus research opportunities are quite varied. Scientific studies include:

- (1) the structural and functional characteristics of the human organism in relation to mobility, self-care and other normal human activities;
- (2) the physiological and biochemical responses of tissues, organs and body systems to external physical sources of energy and to internal energy production exercise, which enhance and aid the healing process and the restoration of useful function;
- (3) pathology of the neuromusculoskeletal system and the physiologic disturbances produced thereby;
- (4) electrophysiology as applied to the diagnosis of neuromuscular disease and measurement of impaired function; and
- (5) the compensatory mechanisms, including the prescribed use of drugs and exercise, artificial limbs, etc., and the behavioral sciences (psychopathology, motivation, and learning) in relation to, adjustment to, and compensation for lost or impaired mental, social, or vocational abilities associated with physical disability.

PHYSIOLOGY

The Department of Physiology is responsible for teaching physiological sciences to undergraduate, medical and graduate students. Medical physiology is offered in the second semester of the medical student's curriculum.

Among research programs being conducted by faculty in this department are: the renin-angiotensin-aldosterone system, congestive heart failure, hypertension, ion transport, cardiac adenosine metabolism, physiology of hibernation and cold stress, renal tubular function, cardiac metabolism and synaptic transmission

in the central nervous system.

A number of research programs are open to medical students for summer fellowships and elective blocks.

Well-qualified students may be considered for the dual-degree MD-PhD program, which requires a minimum of six years' study. After acceptance into medical school, students must be approved for the PhD program. (See Statement of Courses section of this catalog for course listings.)

PSYCHIATRY

Psychiatry and the basic behavioral sciences are taught in all four years of the medical curriculum. Members of the Department of Psychiatry participate actively in planning and teaching the first-year course, Social and Behavioral Sciences, and the second-year course, Introduction to Clinical Medicine. The educational objectives of the psychiatry faculty, both in those courses taught independently and in those taught in cooperation with other departments, are to develop the students' understanding of the biology of human adaptation and the behavioral components which are an integral part of medical science and medical practice; to develop their awareness of the role of emotional factors in human health and illness, and the relationship between physician and patient; to develop their skill in using communication as a preventive, diagnostic and therapeutic technique; and to develop their abilities to practice comprehensive medical care.

All members of the staff participate in both educational and clinical activities. Research interests of the department are broad, but tend to center about the interrelationships between psychiatric disorder and the social environment, psychobiology, and various aspects of child development. In both research and teaching activities—as well as in clinical activities—close cooperation is maintained with other departments of the School of Medicine and UMC, and with appropriate community and state agencies and divisions.

RADIOLOGY

Radiology, a medical specialty deeply rooted in the physical and biological sciences, contributes strongly to undergraduate medical education because it provides additional perspectives into subject matter taught in each of the four years of the medical school curriculum. There are many subspecialties within the field. Three of the four sections within the Department of Radiology are centered around subspecialties; the remaining section is organized for teaching and research.

Diagnostic Radiology. Radiography, fluoroscopy, ultrasound, thermography and computerized axial tomography are used to visualize normal and abnormal structure and function. Through interpretation of such examinations the radiologist provides essential diagnostic and clinical information for patient care. In teaching, the radiologist adds additional techniques to those already employed by the anatomist, physiologist and pathologist for displaying normal and diseased structure and function. A unique aspect of the radiological method is that it permits structure and function to be demonstrated in the living subject. Specialized techniques in angiography, pharmacoradiology, video recording, ultrasonography and computed tomographic scanning have added further dimensions to radiologic demonstration of disease.

Radiotherapy. A clinical service, radiotherapy deals exclusively with the treatment of neoplastic diseases. Treatment modalities include Telecobalt, 2 Mev supervoltage (VandDeGraaff), conventional orthovoltage and superficial therapy. Radium and other radioactive closed sources are selectively used for cancer therapy. Combined clinical tumor conferences are scheduled to provide teaching to medical students, graduate and postgraduate students, and staff. Radiotherapists participate as members of the oncological team. Radiobiological problems, chemotherapy, radiation therapy combinations, radiation physics and protection are subjects of daily review, and are also discussed in weekly radiation therapy seminars.

Nuclear Medicine. The clinical use of radioisotopes for diagnosis, therapy and investigation is the concern of nuclear medicine. As tracers, radionuclides permit determining sites of localization and deposition, spaces and volumes, metabolic rate and turnover, and flow and circulation. Particularly significant diagnostic applications are rapidly evolving which entail *in vivo* scanning of patients to delineate organs, lesions and tumors for the evaluation of their functional characteristics, giving rise to the development of specific radiopharmaceuticals. Also, *in vitro* tests such as radioimmunoassay provide exquisitely sensitive means of analyzing body fluids and their components, as well as endogenous and exogenous organic materials ingested or injected. Higher activities of radionuclides are administered to patients as internal sources of radiation for the treatment of hyperactive organs and systems, neoplasms and metastases.

Radiological Sciences. Teaching activities of this section include basic science curriculum planning and classroom instruction to implement clinical training of resident physicians. The staff is also engaged in

research in a variety of physical, chemical and biological systems.

SURGERY

The Department of Surgery consists of a faculty and supporting staff dedicated to the teaching of surgery through the mechanisms of providing superior care for surgical patients and the generation of new basic and clinical information about surgical problems. The surgical discipline offers a student the opportunity to use basic skills to formulate a thesis of patient management and then to test the thesis in the operating suite or on the wards. The department emphasizes close personal interactions between students and instructors.

The professional components of the department are staffed by full-time board-certified specialists who are members of the Divisions of Cardiothoracic Surgery, General Surgery, Neurological Surgery, Orthopaedic Surgery, Otolaryngology, Plastic Surgery and Urologic Surgery. Surgical patients and activities interface all functions of the University Hospital and Clinics (e.g., child health, medicine, obstetrics and gynecology, nuclear medicine, radiology, laboratories, etc.) so that intra- and interdepartmental interchanges are common. Each division offers clinical and laboratory experiences to students. The surgical clinics and wards, emergency department, special diagnostic units, operating rooms, recovery rooms and intensive care units offer the surgical student an opportunity to participate in the diagnosis and management of surgical disorders.

Members of the surgical faculty are engaged in a wide variety of clinical and laboratory research projects. Students are encouraged to participate in these programs during their free and elective time and to develop research interests of their own.



RESIDENCY PROGRAMS

The residency program in graduate medical education is integrated with the total teaching program at the UMC health sciences complex. An academic setting in close association with clinical faculty members and other residents offers a well-balanced residency training program. Categorical residencies are available in 21 specialties and subspecialties. All listed programs are approved. Shared residency positions may be available upon petition to the program directors.

Emphasis is placed upon the total development of the physician in preparation for future responsibilities. Accordingly, residents assume a direct responsibility for patient care; participate in a formal program of rounds, conferences and case presentations; take an active part in the teaching program; and are encouraged throughout to pursue their particular research interests. Senior residents receive faculty appointments.

Liability insurance is provided for all members of the house staff through the self-insurance plan of the University Hospital and Clinics. All house staff are eligible to participate in the staff benefits provided by the University. Uniforms and laundry are furnished and a paid vacation period, usually three weeks, is granted annually.

Stipends paid to resident physicians are competitive with other Midwest medical centers.

For residency information:

Hugh Stephenson, MD Chief of Staff
University Hospital and Clinics
(314) 882-4913

ANESTHESIOLOGY

The residency program in anesthesiology is accredited by the Residency Review Committee on Anesthesiology of the Liaison Committee for Graduate Medical Education for the continuum of training in anesthesiology and the optional year. The continuum consists of the clinical base year and two clinical anesthesia years.

The anesthesiology program may be entered through a categorical (diversified) program which includes six months in anesthesiology (including respiratory therapy) and four months in general internal medicine. The remaining two months are spent in a medical subspecialty. Six additional months of elective clinical experience must be completed during the subsequent 24 months.

The program director may accept previous clinical experience (e.g., transitional internship, specialty training), so that the trainee may enter directly into the clinical anesthesia years. The latter includes 22 months of classical operating room anesthesia and two months of respiratory care.

Requirements for appointment are:

(1) be a graduate of a medical school of the United States and its territories—approved by the Council on Medical Education—or of Canada, or a graduate of an osteopathic school of the United States who has fulfilled the requirements for acceptance for graduate training as outlined in the "Essentials of Approved Internships and Residencies." Candidates also may be appointed who are graduates of foreign schools and possess a standard FLEX certificate or a full and unrestricted license to practice medicine in the United States, its territories or possessions;

(2) be licensed or licensable to practice medicine in Missouri;

(3) have completed an internship approved by the Council on Medical Education and Hospitals; and
(4) have a personal interview.

Every patient scheduled for anesthesia and surgery is presented and the preanesthetic preparation, medications, techniques, and agents indicated are discussed with the permanent staff. A weekly morbidity and mortality conference is held each Wednesday afternoon. Didactic sessions are held Monday and Friday.

Residents are assigned to the more difficult anesthesiological techniques as they acquire knowledge and skill. Statistics are deemed relatively unimportant; however, each resident is expected to administer approximately 500 anesthetics each year, using various techniques.

An optional year is offered to the trainee desirous of obtaining a full academic background and/or interested in and capable of participating in either basic research or specialized clinical training related to anesthesiology.

Anesthesiology research is directed by members of the full-time staff. Each resident is encouraged to participate in a research project (either clinical or basic) and to publish observations and conclusions in an accredited journal.

Each resident is expected to seek certification as a specialist in anesthesiology following satisfactory completion of the examination offered by the Joint Council on In-Training Examinations.

The department is staffed by six anesthesiologists, each of whom is a Diplomate of the American Board of Anesthesiology or a Fellow of the American College of Anesthesiologists. In addition to the full-time staff, there are four anesthesiologists with clinical appointments.

The basic philosophy is to make this residency program an educational experience for the trainee. The goal is the development of a physician consultant in anesthesiology.

Inquiries concerning this program should be directed to

G. W. N. Eggers Jr., MD, chairman
Department of Anesthesiology.

CHILD HEALTH (PEDIATRICS)

The Department of Child Health offers a graduate training program in child health covering the first, second and third years after graduation from medical school.

The first-year residency is devoted to general pediatric training on the ward, newborn nursery and outpatient clinic, with major responsibility for patient care. The house officer supervises the work of medical students and makes daily rounds with attending staff. Emphasis is placed on continuing follow-up care of well and sick children by the same house officer.

During the second year, general pediatrics experience continues with increasing independent responsibility and with more intensive experience in the pediatric specialties for short periods of time.

The third year is a further development of the second year, with additional responsibility of supervision of first- and second-year resident staff and medical students. Third-year resident staff members participate to a greater extent in the specialty clinics and electives.

Research is encouraged during the third year, with

emphasis on community health and working experience with other health agencies.

Throughout the three year residency, special emphasis is placed on teaching and experience in general pediatrics with increased time allotted for supervised patient care in continuous care clinics. Other unique components of this program are its broad emphasis on growth and development and ongoing evaluation procedures.

Fellowships for two or three years are available in several subspecialties: neonatology, cardiology, gastroenterology and hematology-oncology.

Facilities: The pediatric service, which operates as a referral center for a wide area, assures an excellent variety of clinical material. The children's floor in the hospital includes 42 beds. There are over 100 admissions to the newborn nursery each month, 10 percent of which are transported neonates. Total admissions to the intensive care newborn nursery are over 700 per year.

A hospital school for inpatients who are elementary through high school age is maintained as a supportive, therapeutic component of hospitalization. An active play and recreational program is also part of a child's treatment.

The pediatric outpatient department has approximately 16,000 patient visits per year. In addition to daily general clinics, the following clinics are held weekly: general pediatrics, neurology, cardiology, hematology, gastrointestinal, cystic fibrosis, diabetic, endocrine, renal, pulmonary, high-risk adolescent, rheumatology, genetics counseling and counseling for children with school problems. A developmental evaluation program provides a multidisciplinary approach for the management of children with complex problems. A birth defects program provides for the diagnosis and comprehensive care of selected patients. A Muscular Dystrophy Clinic, sponsored by the Muscular Dystrophy Association of America, serves patients from a 23-county area of central Missouri.

Conferences and Rounds. Teaching rounds are conducted daily on the pediatric ward and in the nurseries with attending staff physicians. The staff also participates in frequent conferences devoted to discussions of problem patients from both inpatient and outpatient services. Weekly grand rounds and a daily radiology conference are held. Research seminars and journal review conferences are held twice monthly. Clinical pathological conferences, pediatric surgery grand rounds, neonatology conferences and mortality conferences are conducted at regular intervals.

The full-time staff has 30 members whose subspecialty interests include cardiology, endocrinology, hematology, neurology, allergy, diabetes, infectious disease, gastroenterology, pulmonary, developmental disabilities, social pediatrics, nutrition, rheumatology, genetics and birth defects, child abuse, neonatology, metabolism and renology.

For further information concerning this program, write to:

Giulio J. Barbero, MD, chairman,
Department of Child Health.

DERMATOLOGY

This medical service, concerned with all aspects of the human skin, is a small group in which students, residents and faculty work closely together in all

projects.

A three-year residency in dermatology includes both clinical and scientific training in accordance with the recommendations of the American Board of Dermatology. Two or three trainees may be accepted each year, receiving the same stipend as do residents in medicine. All residents are expected to teach, carry on some research, write a thesis and take the Board examination.

Clinical Training. Both children and adults may be hospitalized under the direct care of the Dermatology Service. In addition, numerous consultations provide inpatient experience in every specialty of medicine. Outpatients are seen at the University Clinics and the adjacent Veterans Hospital by appointment, providing a means by which cases of high teaching value may be selected. Outpatient and consultation experience is available in all three years of residency.

Exceptional training in diagnosis and management of visible tumors is available through an affiliation with Ellis Fischel State Cancer Hospital in Columbia. The University's Student Health Service, the Marshall (Mo.) State Hospital, and an "out-reach" consulting service to private clinics offer further diverse clinical experience.

Academic Training. Organized seminars are required in clinical dermatology, as well as in the applied sciences applicable to dermatology. Weekly conferences are held in mycology and histopathology. Training for an academic career is available. This program includes both research training and instructorship. Dermatology in context with general medical problems of all types is emphasized and a comprehensive scientific base extending beyond traditional dermatology is presented.

Research Training. Facilities for research include the departmental laboratories which can be involved in tissue culture, immunology and histocompatibility, mycology, biochemistry and electron microscopy. Clinical research can be evaluated on outpatients and in the Clinical Research Center. Computer equipment is available as a separate unit in the hospital.

For further information concerning the residency program, write

Philip C. Anderson, MD, director
Dermatology.

FAMILY MEDICINE

The Department of Family and Community Medicine has responsibility for teaching, research and service activities covering the spectrum from primary medical care to community medicine. Department activities include the training of family medicine residents. Organizational units of the department include sections of behavioral sciences, community health education and family medicine.

UMC has an approved three-year residency leading to board eligibility in family medicine. Ten positions are currently available at each level of the program. Appointments at the first-year level are provided through the National Residents Matching Program.

The program is fully integrated into the UMC Hospital and Clinics. Faculty consists of a core staff of 15 physicians, a psychologist, five nurse practitioners, a nutritionist and a social worker—plus physician consultants from each major specialty area.

The program is designed to facilitate the education of highly qualified family physicians who are competent to

The Newborn Intensive Care Unit is a major referral center for high-risk newborns. About 700 are treated here each year.

deal with 90 percent of the problems in their practice. It is recognized that the program must vary from resident to resident, based upon the location in which each wishes to practice and upon individual desires. Consequently, flexibility is the key. The core of the program lies in family medicine with approximately one-third of the first year and one-half of the subsequent years within family medicine.

Residents practice in three centers. The Family Medical Care Center is located as a separate facility within the UMC health sciences complex and offers an ongoing program of preventive and acute care for families who reside within the Columbia area. The Callaway Family Medical Care Center is located in the rural community of Fulton, 25 miles east of Columbia, and the Fayette Medical Clinic is located 25 miles northwest in the rural community of Fayette. More than 3,500 patients are seen monthly in the three model units. Patients are hospitalized at the University Hospital, Keller Memorial Hospital in Fayette and Callaway County Hospital in Fulton.

In addition to the core program in the Family Medical Care Center, rotations are available on each inpatient service, as well as ambulatory areas, both within the UMC Hospital and Clinics and in other locations. Residents function as teams when assigned to inpatient services. Each team of two residents is responsible for approximately 15 inpatient beds on each service, as well as for their own patients in the Family Medical Care Center. With continuing care responsibility for their own patients, they are in a better position to use the inpatient rotations for their specific needs as family physicians.

During the first year of the training program, the trainees divide their time between inpatient services in internal medicine, child health, surgery, and obstetrics and gynecology while maintaining major responsibilities in the Family Medical Care Center program. The second and third years of the residency permit opportunities in surgery, psychiatry, child health, medical subspecialties and surgical subspecialties, both on University services and in affiliated practices in the community.

For additional information write

Jack M. Colwill, MD, director
Family Medicine.

GENERAL PREVENTIVE MEDICINE

The residency program in general preventive medicine provides residents with training which would make them eligible for certification by the American Board of Preventive Medicine. This includes 12 months of academic training leading to a Master of Science in Public Health (MSPH) degree, 12 months of clinical training in one or more specialties related to preventive medicine, and 12 months of field experience in preventive medicine. There are positions for six residents, two in each of three years of the program.

During the three years of training, the resident completes the total time required in each component of the program. However, two or more of these activities may be carried on at any one time. For example, academic training may be spread over a two- or three-year period. The resident may be on a research assignment while taking some formal course work. In other words, this residency is not conducted using a

rigid block system of assignments. However, the block system is provided to an occasional resident who feels more comfortable with it.

Clinical Training. The clinical phase of the training totals one year; however, it can be spread over a two-year period. Ordinarily, clinical training begins in the first year of the residency. No clinical assignment is shorter than three months or longer than 12 months. The nature of the clinical assignment is based on the resident's clinical interests. Arrangements can be made for the resident to have training in one or more of the following specialties: internal medicine, child health, obstetrics and gynecology, psychiatry, physical medicine and rehabilitation, and family medicine. The percentage of time spent on each service is determined according to the resident's needs and interests.

Academic Training. Formal academic training for the resident is provided through the approved graduate program which leads to the MSPH degree. This is a 32 semester-hour degree. Each resident is required to complete a research project which is presented as a formal thesis for this degree.

Field Training. During the field training experience, the resident spends approximately six months at an institution in which preventive medicine is practiced and six months gaining additional experience, skill and practice in epidemiology, or some other area of preventive medicine research.

When assigned to an institution for the practice of preventive medicine a resident spends no less than one day or more than seven days for a general orientation of that agency. Assignments are made to an area of practice consistent with each resident's academic, clinical and research interests and needs. In this setting, they see the application of their academic training and research to the everyday practice of preventive medicine. Service in this institutional setting is of at least three months' duration.

The following Missouri institutions have agreed to provide field training: Missouri Division of Health, Jefferson City; Columbia City Health Department, Columbia; and the Kansas City Department of Health, Kansas City.

Occasionally, a resident may wish to spend 12 months at one or more institutions in which preventive medicine is practiced. This is possible within the framework of the residency program.

Research skill, experience and practice is supervised by a faculty member. The School of Medicine probably will be the center from which this research is conducted. If research is conducted elsewhere, a faculty adviser maintains close communication with the resident.

For additional information write

William C. Allen, MD, director
Preventive Medicine.

MEDICINE

Graduate education in the Department of Medicine represents a progression from medical school experiences to increasing responsibility and competence in the care of patients. Twenty new postgraduates may be appointed each year. The residency emphasizes general internal medicine and is approved for three or more years of training.

Rotations are available in the division of cardiology, infectious disease, hematology and oncology, gastroenterology, endocrinology and metabolism, immunology

gy and rheumatology, nephrology, pulmonary and environmental medicine, ambulatory care, the Arthritis Center and the emergency room.

Fellowships are available after completion of residency in all major subspecialty areas.

For further details concerning this program, write Michael Perry, MD, chairman
Department of Medicine.

Neurology

There is no neurology residency for the first year of graduate medical education. Individuals interested in the approved neurology residency for the second, third and fourth years of graduate medical education must complete their first year in an approved internal medicine or pediatrics program. The Department of Medicine gives consideration to medical students applying for a first year of graduate education in internal medicine and already accepted by the Department of Neurology for the subsequent year.

The residency in neurology is approved for three years of training. Usually two residents from each level of training are appointed each year for a total of six residents annually.

The resident's first year is spent largely on the neurology wards of the University and Veterans hospitals, with approximately three months devoted to the consultation service. The second year includes rotations on neuropathology, electromyography, pediatric neurology, electroencephalography and the consultation service. The physician usually spends half of the third year as the chief resident and pursues elective activities during the remaining six months. Electives may include neuroradiology, psychiatry, physical medicine and rehabilitation, research, experience with a practicing neurologist(s) etc.

For further details concerning this program, write James Dexter, MD, chairman,
Department of Neurology.

OBSTETRICS AND GYNECOLOGY

An accredited four-year postgraduate residency program is offered to medical school graduates with firm career goals in obstetrics and gynecology, which results in American Board eligibility.

Six months of extra-disciplinary elective time is made available to the first-year resident physician. Electives include but are not limited to: internal medicine, anesthesiology and child health. The remaining six months are divided equally between obstetrics and gynecology.

The second year of the resident's time is divided equally between obstetrics and gynecology. Residents assigned to obstetrics assume responsibility for the care of patients on the obstetric ward and in the labor and delivery rooms. They conduct both nonoperative and operative deliveries under appropriate supervision.

Residents assigned to gynecologic services are responsible for the pre-operative and post-operative care of patients and perform minor gynecologic operative procedures.

The third year resident obstetrician-gynecologist assumes primary responsibility in the outpatient clinic under direction of a chief resident. During the year, the resident consults with first-year residents on both

obstetrics and gynecology, manages the more complicated problems, gains surgical experiences as first assistant, and performs major gynecologic operative procedures.

During the last year, the chief resident obstetrician-gynecologist is responsible for the operation of the entire service, consulting as necessary with attending faculty. Liberal surgical experience is acquired.

Scheduled rounds are conducted with the attending staff at least three times weekly. Departmental conferences, as well as joint conferences with radiotherapy and pathology staff, are held weekly. A joint conference with pediatricians is held monthly.

All residents participate actively in the teaching of medical and nursing students. Participation in departmental research programs, as well as in projects of the resident's choosing, is encouraged. Opportunities are provided for attendance at regional and national medical meetings.

Physical facilities for the Department of Obstetrics and Gynecology consist of an obstetric wing providing 32 beds for ante- and post-partum patients, and labor and delivery room suites. Rooming-in facilities are available to patients who request them. This medical center is designated a Level III High Risk Maternity Referral Center.

A separate 25-bed area is reserved for gynecologic patients. Additional facilities of the department include the out patient clinic, operating rooms, administrative offices and research laboratories.

Occupancy rates in the obstetric-gynecology units average 75 to 90 percent capacity. Births at the UMC Hospital totaled more than 1,200 last year, and approximately the same number of gynecologic operative procedures were carried out. A high proportion of the obstetric census (75 percent) is complicated, referred for consultation or therapy. More than 15,000 patients are seen in the department's outpatient clinics each year. These patients are referred from all sections of Missouri and thus provide a variety of problems for teaching purposes.

For information contact
David G. Hall, MD, chairman,
Department of Obstetrics and Gynecology.

OPHTHALMOLOGY

A three-year residency in ophthalmology is offered by UMC. Beginning residents are added to the program on July 1 of each year. Candidates apply through the Ophthalmology Matching Program, sponsored by the Association of University Professors of Ophthalmology, P.O. Box 7999, San Francisco, California 94120.

During the first year, residents are required to attend a formal postgraduate course in ophthalmology as approved by UMC. The ophthalmology postgraduate courses conducted by the Harvard University Graduate School of Medicine, the University of Pennsylvania Graduate School of Medicine, the Stanford University Graduate School of Medicine, or the Lancaster Course in Ophthalmology given at Colby College are examples of approved programs for this purpose. The resident is given leave of absence with pay for the time required to complete the course.

Facilities for training include well-equipped clinics, operating rooms and laboratories at the Veterans Hospital and the Eye Research Foundation of Missouri. Conferences, seminars and teaching rounds are con-

ducted daily. General ophthalmology clinics are held on Monday, Wednesday and Friday, and surgery is performed on Tuesday and Thursday. Subspecialty clinics are being developed. Specialty teaching seminars, photography sessions, and problem case sessions are conducted weekly.

All residents are expected to enroll for the Home Study Course as given by the Academy of Ophthalmology and Otolaryngology and to engage in a continuous and systematic reading program as outlined by the staff.

All residents are encouraged to participate in research in the laboratories or clinics. This may take the form of assistance to the research interests of the staff, or residents may develop their own independent project under staff approval and supervision.

Residents have a minimum of independent responsibility for care of patients during the first year. They are instructed in the details of ophthalmological examination, inpatient and outpatient care, and surgical procedures. During the second year, they assume more responsibility in diagnosis and treatment and begin major eye surgery. Extensive experience in surgery is provided in the third year.

Close and readily available supervisory or consultative guidance is provided by the full-time staff throughout the whole program.

Clinical and research fellowships are available for a fourth year of training. Post-doctoral fellowships and graduate assistantships for candidates for advanced degrees are made possible through collaboration with the Department of Biochemistry or Division of Biological Science.

For further information, contact
Robert Patrick Burns, MD, chairman
Department of Ophthalmology.

PATHOLOGY

The Department of Pathology is committed to its residency training program; residents are welcomed into all aspects of departmental activities. The residency is a categorical program and the first year is an integral part of the training offered. Designed primarily to provide a broad basis of knowledge, experience and technical ability for those who wish to practice pathology, the program provides opportunity, as well as encouragement from the staff, for those interested in academic pathology to gain experience in teaching and research. While the residency program follows a general scheme, it is flexible enough to be adapted to the needs and interests of the individual through elective opportunities. Satisfactory completion of the four-year program satisfies the training requirements for admission to the qualifying examination for certification by the American Board of Pathology in anatomic and clinical pathology (AP/CP 4 certificate).

The department has been approved for a total of 16 residents in the general pathology AP-CP program. Generally, four are accepted per year. Residents are usually accepted through the National Resident Matching Plan to start on July 1 following their graduation from medical school. On occasion, highly qualified individuals may be accepted to start at other times if positions are available. Applicants who have had experience in other clinical disciplines are considered on an equal basis with current graduates.

Rotations schedules provide for six months of anatomic

pathology and six months of clinical pathology during each of the four years. In anatomical pathology the resident will gain experience in all aspects, including autopsy and surgical pathology, cytology, aspiration cytology and electron microscopy. Clinical pathology rotations are arranged so that the resident will spend at least two periods in each of the major areas of chemistry, microbiology, hematology (including blood bank and coagulation), immunology and serology.

The first rotation period emphasizes basic principles and methodology of the objective measurement of disease by laboratory techniques. The second rotation extends the resident's basic knowledge and introduces troubleshooting problems. The resident serves as a consultant to the clinician and manages that section of the laboratory. A rotation through the Ellis Fischel State Cancer Hospital introduces the operation of a smaller laboratory, more comparable to most community hospital laboratories, and affords experience in the highly specialized anatomical pathology seen in such a specialty hospital. Fourth-year residents are accorded increased professional and managerial opportunities and participate in the organizational mechanics and problem solving of the hospital laboratory. Through proper use of elective time an individual can acquire considerable knowledge in an area of special interest.

Conferences and Teaching. Residents have a daily morning didactic conference in which lectures are presented by pathology faculty, invited speakers or residents themselves. Equal time is devoted to anatomical pathology and to clinical pathology subjects. Once weekly this conference is devoted to a review of the organs and tissues from interesting autopsy cases of the preceding week. Residents also participate in interdepartmental teaching conferences and patient care conferences on a regular basis. Case presentations at morbidity and mortality conferences of other departments are given by the residents closely associated with the cases. Pathology faculty members are available to assist the residents in preparing to present the anatomical or clinical laboratory findings and to discuss the disease mechanisms involved.

Because teaching at various levels for different groups is frequently a responsibility of the practicing pathologist, residents are required to gain experience by assuming some responsibility for teaching the pathology courses for second-year medical students. The minimum requirement is supervision of a number of laboratory sessions during the academic year. This teaching experience is largely based on the case-study approach and involves general, special and clinical pathology subject matter. Residents who wish to gain more teaching experience may become involved in planning laboratory sessions and sections of the course, or may give lectures by invitation of the faculty member in charge of a section of the course. Further opportunities for teaching may be found in the medical technology, cytotechnology and histotechnology programs.

Research Opportunities. Research is not required of residents, but is encouraged by the staff. Opportunities to become involved in existing projects for the staff are available. Within the limited space and budgetary constraints of the department, it may be possible for a highly motivated resident to establish a research project with a member of the faculty assigned as a guide. Research may be in an aspect of basic science or in

applied clinical research. Research interests of the faculty are listed in the Graduate Studies section of this *Catalog*.

Within budgetary constraints, opportunity will be provided to residents to attend regional or national meetings of their choosing in the field of pathology. Residents are encouraged to submit case reports or results of research to national organizations for public presentation or publication.

For application or additional information regarding this program, write:

John F. Townsend, MD, chairman
Department of Pathology.

PHYSICAL MEDICINE AND REHABILITATION

Two positions are approved for each of three years in the residency training program in physical medicine and rehabilitation.

The first year is spent in the inpatient rehabilitation service, in the physical medicine and rehabilitation outpatient clinics, and in the elective services, e.g., orthopedics, internal medicine, neurology or child health.

To be eligible for the second year of residency, the physician must have completed one year of residency in a physical medicine and rehabilitation program, or have at least one year of approved training in another recognized residency program, or have completed four or more years of general practice. This year is devoted to anatomy, kinesiology, biophysics, research and electives.

The resident must have completed a two-year residency program in physical medicine and rehabilitation to be eligible for the third year of training in this program. This final year is spent on the inpatient rehabilitation service, the outpatient clinic and inpatient consultation of the Section of Physical Medicine and Rehabilitation.

A million-dollar expansion program has been completed in the Howard A. Rusk Rehabilitation Center. The enlarged facility handles 600 outpatient visits a month and has 40 beds for inpatients.

For further details regarding this program write
Agnes H. Moon, MD, director of Educational Programs,
Department of Physical Medicine and Rehabilitation.

PSYCHIATRY

The Department of Psychiatry currently offers a four-year, approved residency program, with academic and clinical training in all requisite phases of psychiatry necessary to produce competent specialists. In accordance with guidelines set by the American Board of Psychiatry and Neurology, the department offers a first post-MD year categorical program, including an internship equivalent year which is flexible in content to meet the educational needs and interests of the individual resident. The first year includes a four-month rotation on those medical services of particular value to the psychiatrist in training. This initial year is followed by three years of general psychiatry residency. Those having sufficient training begin at the second post-MD year level. The first three and one-half years of the four-year training sequence are devoted to core experience with the remaining six months devoted to elective work.

Facilities. The Mid-Missouri Mental Health Center,

a 71-bed, comprehensive-care state unit adjoining the health sciences complex, functions under the educational supervision of the Department of Psychiatry. Active outpatient, psychosomatic, consultation, child psychiatry and rehabilitation divisions operate jointly with sections in clinical psychology, psychiatric social work, psychiatric nursing and ancillary therapies to provide the highest level of education and patient service.

An additional 60 beds for psychiatry are included in the Veterans Hospital.

On the clinical services, acutely ill and some chronically ill patients demonstrating all types of major psychopathology are evaluated and treated. All operationally useful therapeutic techniques are used. These include individual and group psychotherapy; psychopharmacologic treatment; behavior modification techniques; biofeedback; hypnosis; sexual, marital and family therapy; and electro-convulsive therapy. Provision also is made for evaluation of forensic cases. Generic principles and basic techniques are identified and stressed in the teaching program so that residents obtain experience in many types of diagnostic and therapeutic procedures, including interviewing techniques, psychological testing, brief psychotherapy and others.

Research. The health sciences complex provides a setting for intensive psychiatric, psychological and sociological investigation of mental and emotional disorders. Facilities and equipment include psychiatric research facilities, electroencephalographic recording equipment, electronic brain wave analyzers, a computer center, advanced equipment and laboratories for biochemical investigation and quarters for animal investigation. Also, sound-proof, air-conditioned interviewing rooms equipped with one-way mirrors and high fidelity tape recording apparatus are provided for research and training in psychotherapy and interviewing techniques. Closed-circuit television and other new audiovisual facilities are available within the health sciences complex. Consultants from all relevant medical school and other UMC departments participate in educational programs.

Special research training in psychiatric biochemistry and mental health information systems is available in the years following basic residency training at the Missouri Institute of Psychiatry in St. Louis, an affiliate of the Department of Psychiatry at Columbia.

Clinical Training. A basic principle of this department is that, within the structure of the residency training program, continuity of patient care is not sacrificed to expediency. The same resident, throughout the training period, follows and treats at least some of the same patients, both adults and children.

In keeping with modern educational principles and changing demands on the psychiatric profession, this department has created a residency program which permits considerable flexibility, and which emphasizes a project-oriented and problem-solving approach tailored to individual needs whenever possible. Our didactic program consists of a core curriculum including lectures, seminars, rounds and tutorials, as well as individual and group supervision. The first phase of the clinical program consists of four months of internal medicine or pediatrics and 12 months of inpatient psychiatry. The second phase includes 12 months of adult outpatient and child psychiatry training, three months of clinical neurology and five months of

The Department of Psychiatry publishes its own nationally-distributed journal.

consultation/liason psychiatry. In addition, residents spend approximately one-half day per week in community psychiatry functioning as consultants (with faculty supervision) to various community agencies. The third phase of the program consists of six months of supervisory experience on inpatient wards or in the outpatient clinic and six months of elective time. Additional experience in medicine, family practice or pediatrics may be arranged in the elective period. Special scheduling arrangements are available during the second and later years for residents who are also homemakers.

Throughout the clinical training experience, each resident is assigned patients for intensive individual and group psychotherapy, with appropriate supervision provided by senior staff members and consultants. The team approach to psychiatric care receives special emphasis. Under supervision the resident also evaluates and treats patients on general medical, surgical, pediatric and other wards who present emotional or mental problems to their ward physicians. The resident also assists in consultation to state and local agencies and institutions, courts and prisons. A portion of this time may be spent at affiliated state hospitals working with patients suffering from acute psychotic reactions and chronic disorders.

In the fourth year, a variety of electives are offered for varying amounts of time. Electives include: child psychiatry, alcoholism and drug abuse, forensic psychiatry, geriatric psychiatry, marital and family therapy, hypnosis, treatment of sexual disorders, student mental health, inpatient service (ward administration), community psychiatry, psychosomatic medicine, neurosciences, psychiatry in family practice, mental retardation, psychophysiology, advanced psychotherapy, psychiatric applications of clinical psychology, biochemistry, pharmacology and others.

In addition to acquiring basic knowledge and clinical skills, the psychiatric resident should develop scientific curiosity and critical inquiry into existing or newly formulated concepts and methods. In order to acquire new skills and demonstrate scientific acumen, all general psychiatry residents are expected to engage in a project and present it in a formal paper which must meet the approval of the Educational Committee before a certificate of completion of training is issued. The project may involve research, a critical review of the literature or some other creative endeavor approved by the education committee.

Special fifth-year academic fellowships in advanced clinical psychiatry, community psychiatry, research or a variety of other subspecialty areas also are offered.

The Department of Psychiatry also has developed, as a portion of the residency program, an optional program of academic work leading to a Master of Science in community mental health and behavioral science, mediated through the medical school's Department of Family and Community Medicine.

Other combined programs leading to advanced degrees in relevant basic science or psychological science areas may be similarly arranged on an individual basis.

Teaching. All members of the Department of Psychiatry participate in educational activities, as well as in the clinical research programs. Organized instruction (including individual tuition), seminars and clinical conferences in psychiatry, psychopathology, psychotherapy, psychology, neuroanatomy, neurophysiology,

neuropathology, neuroradiology and the behavioral sciences are provided by members of the department and health sciences complex staff and by guest instructors and lecturers.

Appointments Available. Four first-year residency positions are offered. Service generally begins on July 1 or January 1, but the program allows exceptions to these starting dates. Candidates must meet standard prerequisites for admission to residency programs, and those with prior residency training will be considered for admission to advanced standing. Residency positions also are open to selected graduates of foreign medical schools who have met requirements of the ECFMG and the Immigration and Nationality Act.

As members of the academic staff, residents are eligible for insurance (including medical coverage for the entire family at a nominal cost) and other benefits.

For additional information, write

David Davis, MD, associate chairman and chief
Psychiatry.

CHILD PSYCHIATRY

The child psychiatry program uses facilities of the Mid-Missouri Mental Health Center and the University health sciences complex.

A close working relationship, with provisions for mutual consultation and training, is maintained with the Department of Child Health.

Community mental health programs offer residents supervised experience with group homes, juvenile courts, nurseries, public and correctional schools and mental retardation facilities. As a part of the School of Medicine and the total University, the program has access to academic psychology, special education, reading clinics, sociology, bioengineering and computer services.

Staff. The teaching staff includes seven full-time child psychiatrists, social workers, psychologists, speech pathologists, a child development specialist, special education teachers, guidance counselors, occupational and recreational therapists, and a full complement of nurses and psychiatric aides.

Program. Supervised experience is provided in the evaluation and treatment of emotionally disturbed children, ages six through 16. Similar experience with preschool children is provided through the Child Development Unit. The advanced fellow does consultation for a variety of community agencies and participates in the medical student teaching program. Regular conferences, staffings, grand rounds, seminars and colloquia occupy a significant portion of the resident's training experience. Participation in research programs, worked out on an individual basis, is encouraged.

The child psychiatry section is eclectic in orientation and uses and teaches all standard treatment modalities. The biopsychosocial interrelations of mental illness are stressed.

Four residency positions are offered. Candidates must meet the same standards outlined in the general psychiatry program. Special arrangements can be made for part-time training.

Additional information may be secured from
Syed Arshad Husain, MD, director
Child Psychiatry Residency Training, or
James L. Chapel, MD, chief,
section of Child Psychiatry.

RADIOLOGY

The Department of Radiology is divided into three major divisions, each of which offers residency training: diagnostic radiology, radiation therapy and nuclear medicine.

The Diagnostic Radiology residency program accepts applicants at either the PGY-1 or PGY-2 level and correspondingly offers four-year or three-year residency training programs. Included in the diagnostic radiology rotation are four preceptorships in the first year in the basic fundamentals of radiology, chest radiology, gastrointestinal radiology and genito-urinary radiology.

The second year is devoted to subspecialty training including pediatric radiology, ultrasonography, visceral and peripheral angiography and neuroradiology training. CT scanning is included as a separate rotation. In addition, two months of nuclear medicine are provided in either the second or third years.

The third year of diagnostic radiology for those residents who entered at the PGY-2 level consists of three to six months of electives and the remaining is diagnostic "rounding out" or completion of training in the areas where needed as designated by the faculty. For those entering as a PGY-1, additional training in regular diagnostic radiology, re-emphasizing strengths in the basics and the subspecialties is carried out during the third year. The fourth year for those individuals entering as a PGY-1 consists of three to six months of electives and additional experience in general radiology.

Included in the third and fourth years is rotation through the Ellis Fischel State Cancer Hospital Diagnostic Radiology Department under the supervision of the chairman, and opportunities to participate in research in computer applications within radiology are available.

The Mid-America Bone Diagnostic Center and Tumor Registry has existed in this department since 1971 under the sponsorship of the American College of Radiology. It is one of only three such registries in the United States and is a center of excellence for bone tumor and other bone disease diagnostic studies by X-ray method. Outstanding teaching in this area is provided by virtue of the great variety of case material available.

The emphasis in the program is on teaching, both on an individual preceptor level and by active participation in conferences. Ten resident conferences are held each week and include a full course in radiation physics and radiobiology each year. Our residents have scored well in their written boards, this past year in the top 90th percentile.

The Radiation Therapy residency program is certified for four years and provides eligibility to the American Board of Radiology Therapy examination for certification. These four years of training include three years of training in radiology plus a year of internship or a year in another specialty or within radiology itself. A fifth year of training can be arranged to meet special needs and desires on an individual basis.

A Nuclear Medicine residency program has been approved for certification by the American Board of Nuclear Medicine. A fourth year in radiology designated as nuclear radiology is an established and certified program which provides eligibility for the certification examination of the American Board of Radiology in Nuclear Radiology. Training is available in *in vivo* imaging as well as in *in vitro* analysis if desired.

Therapy with radionuclides is also included in the program.

Applications for radiology residency positions should be addressed to David Witten, MD, chairman, Department of Radiology.

SURGERY

Each division of surgery has an established, approved resident training program. Residents may be admitted into the plastic surgery training program after three or more years of general surgery residency and into the cardiothoracic training program after completion of a general surgery residency. Residents advance into the other surgical training programs after completing a one-to two-year period designed to enhance their knowledge of surgical physiology and basic surgical skills. Thirteen first-year surgical residents are accepted each year. The residency training programs are tailored within the guidelines established by the respective residency boards, and each resident is encouraged to spend additional time in laboratory investigation and clinical fellowships.

Facilities available to the Department of Surgery include 150 adult beds and 20 children's beds in the UMC Hospital and Clinics, surgical outpatient clinics, operating suites and recovery room, intensive care units, burn unit, emergency suite, animal quarters and animal operating suite, research laboratories, and comparable facilities (including 158 surgical beds) in the Harry S. Truman Memorial Veterans Hospital.

Members of the full-time staff share the responsibilities of teaching rounds, conferences, lectures and outpatient consultations. Research is being conducted on cardiovascular surgery, vascular physiology, burn metabolism, renal physiology, gastrophysiology, neurophysiology, trace metal metabolism, parenteral nutrition, obesity, bladder physiology, thromboembolic disorders, oncology and transplantation.

GENERAL SURGERY

General surgery offers a five-year residency training program. Satisfactory completion of the program enables the individual to apply for examination by the American Board of Surgery. The major portion of the training is obtained in the UMC Hospital and Clinics and in the adjacent Veterans Administration Hospital.

The first two years of the program are designed to provide basic experience in the field of surgery, irrespective of ultimate career goals, and are recommended as initial steps for all surgical training programs. During the first two years residents are assigned to the general surgery service and may also spend time on other surgical specialties, surgical pathology and anesthesiology. The final three clinical years are devoted to expanding the surgical resident's knowledge and skills as they relate to general surgical problems. Residents are expected to be involved in clinical investigations and are encouraged to spend additional time in the surgical research laboratories or in the basic science laboratories.

The resident staff, with help from the full-time faculty, is responsible for the clinical management of all surgical patients. Daily rounds, grand rounds, mortality and morbidity conferences, resident clinical and basic science seminars, and other appropriate clinical and research conferences—all of which promote an active

teaching program—are held at regular intervals. Throughout their training program, the residents assume increasing operative responsibilities which culminate in a rich experience with a wide variety of surgical conditions during the chief resident year. **For additional information**, contact

Donald Silver, MD, chairman
Department of Surgery.

CARDIOTHORACIC SURGERY

The residency program in cardiothoracic surgery at UMC offers a balanced clinical experience in general thoracic surgery and cardiac surgery including open heart procedures in children and adults. The resident rotates at both junior and senior levels of responsibility through the University Hospital and Clinics and Veterans Hospital. Selected residents are allowed an additional year, over the standard two-year program, to pursue investigational interests and obtain additional clinical exposure. Residents are encouraged to pursue clinical research and are given the opportunity to participate in the teaching of medical students, nurses and paramedical personnel.

Applicants to the program must be eligible for examination by the American Board of Surgery. One or two residents are selected each year.

Direct inquiries for additional details to

Jack Curtis, MD, chief
Cardiothoracic Surgery.

NEUROLOGICAL SURGERY

The Division of Neurological Surgery offers an accredited five-year training program. Applicants should have had at least one postgraduate year of general surgery training. Upon completion of the program, the candidate is eligible for certification by the American Board of Neurological Surgery.

Applications and inquiries should be directed to
Clark Watts, MD, chief
Neurological Surgery

ORTHOPAEDIC SURGERY

The University of Missouri-Columbia offers an approved residency program in orthopaedic surgery which leads to board certification. Two applicants are accepted into the program each July.

The program includes children's orthopaedics, adult orthopaedics, fractures, reconstructive orthopaedic surgery and instruction in the basic sciences. One year of general surgery or a comparable year of training is required for the orthopaedic residency program. **For further details** write

William C. Allen, MD, chief
Orthopaedic Surgery.

OTOLARYNGOLOGY

The Division of Otolaryngology offers an approved program leading to board certification. One year of general surgery training is required in addition to the four years of training in otolaryngology.

A broad surgical experience in all aspects of otolaryngology, including head and neck lesions and maxillofacial trauma, is provided. Weekly conferences cover pathology, radiology and associated basic science topics. Residents rotate between the University Hospital and Clinics and the adjacent Veterans Administration Hospital.

Address correspondence to
William E. Davis, MD, chief
Otolaryngology.

PLASTIC SURGERY

The Division of Plastic and Reconstructive Surgery offers a fully accredited two-year training program. Applicants must have had a minimum of three years of training in surgery, with the third year at a senior resident level (as required by the American Board of Plastic Surgery). Sufficient general surgery training to meet the requirements of the American Board of Surgery is desired.

The training program offers experience in congenital deformities, maxillofacial trauma, head and neck cancer, burns, hand, and cosmetic surgery. Conferences on general plastic surgery, hand, cleft lip and palate, burns, and head and neck cancer are held regularly. A microvascular laboratory is fully staffed and actively engaged in research. It is also available for basic microsurgical training. Clinical and basic research in the areas of cleft deformity, burns, wound problems and microvascular surgery is encouraged. Two residents a year are accepted for a two year residency.

Applications should be directed to

Charles L. Puckett, MD, chief
Plastic Surgery.

UROLOGY

The approved residency program in urology at the UMC health sciences complex provides training and experience at the contiguous University and Veterans Administration hospitals.

The two years of postgraduate education required by the American Board of Urology, prior to the three years of urology, are offered by the Department of Surgery and are tailored to the requisites of the urology residency. Two appointments to the residency program are made each year.

The clinical services of urology offer a broad experience of gradually increasing responsibility for patient care and management. The surgical approach to all phases of genito-urinary disease, including renal transplantation, is under the direct supervision of a full-time staff, and a strong liaison is maintained with Nephrology and the Rusk Rehabilitation Center. Pediatric urology is a vigorous component of the clinical experience.

During the clinical years specific periods may be set aside for research activity in the urological laboratories. The completion of a basic or clinical research project is encouraged.

Applications should be directed to

Gilbert Ross Jr., MD, chief
Urology.

STATEMENT OF COURSES

INTERDISCIPLINARY COURSES

- 205M Social and Behavioral Sciences I (3).**
206M Social and Behavioral Sciences II (2).
207M Social and Behavioral Sciences III (2).
208M Social and Behavioral Sciences IV (1).
220M Introduction to Clinical Medicine I (1).
221M Introduction to Clinical Medicine II (2).
222M Introduction to Clinical Medicine III (2).
240M Neurosciences I (5).
241M Neurosciences II (3).

ANATOMY

- 202 Elementary Anatomy (5).** Prerequisite: 5 hours biological science or equivalent. f, w.
205M Medical Gross Anatomy (8). f.
206M Medical Developmental Anatomy (2). f.
207M Medical Histology (4). w.
240M Neurosciences I (5).
300 Problems (cr. arr.)
301 Human Gross Anatomy (8). Prerequisites: 201, comparative anatomy or equivalent and instructor's consent. f.
303 Human Developmental Anatomy (2). Prerequisites: vertebrate embryology and instructor's consent. f.
304 Human Histology and Organology (4). Prerequisite: 10 hours of biology & instructor's consent. w.
305 Anatomy of the Human Nervous System (3). Prerequisites: 201, comparative anatomy or equivalent, & instructor's consent. w.
306 Autonomic Nervous System (2). Prerequisites: 201, comparative anatomy or equivalent, & instructor's consent. f.
308 Hematopoietic Organs (2). Prerequisite: basic histology & instructor's consent. w.
312 Biology of the Endocrine Organs of Man I (2). Prerequisites: advanced standing in biological sciences, instructor's consent. f.
313 Biology of the Endocrine Organs of Man II (2). Prerequisite: 312, instructor's consent. w.
405 Mammalian Reproduction (3). Prerequisite: graduate standing in one of animal, biologic, medical, or veterinary sciences, instructor's consent, Biochemistry 304 or equivalent. w.
410 Seminar (1). f, w.
450 Research (cr. arr.)
490 Research (cr. arr.)

ANESTHESIOLOGY

A Anesthesiology Elective (10). Junior and senior students. The goals are to provide students (a) an understanding of certain truths associated with the anesthetic state (e.g., the inability of a person to protect himself from the environment; concomitant and common depression of systems of the body other than the nervous system); (b) an opportunity to learn to think and react quickly and correctly in times of stress; (c) to develop knowledge and skills at maintaining artificial ventilation and circulation; (d) to develop technical skills (e.g., insertion of endotracheal catheters, intravenous infusions); (e) to understand some of the rationale in the choice of an anesthetic agent or technique; (f) to relate the morbidity and mortality of anesthesia to surgical patients; (g) to inform students of the functions of anesthesiologists in the care of nonsurgical patients (e.g., respiratory therapy, pain problems); and (h) to attract students to the specialty of anesthesiology. Eight-week peri-

ods are preferred although four-week electives are available. Actual participation in anesthetic evaluation and administration for surgical procedures is combined with close individual supervision. Arrangement for electives is with the department chairman.

P Postgraduate Instruction. Formal training is established and accredited. The residency is of two or three years duration. Goals: an understanding of certain truths associated with the anesthetic state; an opportunity to learn to think and react quickly and correctly in times of stress; to develop knowledge and skills at maintaining artificial ventilation and circulation; to develop technical skills; to understand some of the rationale in the choice of an anesthetic agent or technique; to relate the morbidity and mortality of anesthesia to surgical patients; to inform students of the functions of anesthesiologists in the care of nonsurgical patients. Objectives are reached by close supervision by the staff during administration of anesthesia by students to patients undergoing surgery, by preoperative discussion of anesthetic management for every patient. Didactic lectures and morbidity and mortality conferences. Exposure to visiting professors and anesthesia-oriented research, with directed reading and adequate time for study.

BIOCHEMISTRY

- 10 Biochemistry, the Field and the Profession (1).**
110 Introductory Biological Chemistry (3). Prerequisite: 5 hours general chemistry. f, w.
193 General Biochemistry (3). Prerequisites: Chemistry 1; Biochemistry 110 or Chemistry 210-211 or Chemistry 205; sophomore standing. f, w.
195 General Biochemistry Laboratory (2). Prerequisite: same as 193. f, w.
203 Elementary Biochemistry (3). Prerequisite: 3 hours organic chemistry. w.
204 Elementary Biochemistry Laboratory (2). Prerequisite: organic chemistry. w.
206 Medical Biochemistry (8). Prerequisites: 8 hours general chemistry, 5 hours organic chemistry. Some quantitative chemistry recommended. f.
240M Neurosciences I (5).
270M Biochemistry (3). Prerequisites: one year inorganic chemistry, 5 credits organic chemistry with laboratory. Recommended: quantitative analysis. f.
272 Biochemistry (3). Prerequisite: 270. w.
274 Biochemistry Laboratory (4). Prerequisites: 270 and 272, or 272 concurrently. f, w.
299 Seminar (1). Prerequisites: senior standing, a minimum of 10 hours chemistry including a biochemistry course with laboratory.
300 Problems (1-3).
301 Biophysics (3). Prerequisites: general chemistry & physics, calculus & a biological sciences course. f.
303 Techniques in Nutritional Biochemistry (3). Prerequisite: six hours biochemistry or concurrent with 272 or 322. w.
304 General Biochemistry Lectures (5). Prerequisites: organic chemistry and quantitative chemistry & biology. f.
305 Biochemistry Laboratory (3). Prerequisites: organic chemistry and quantitative chemistry. f.
310 Trace Analysis (3). Prerequisite: quantitative analysis. w.
312 Instrumental Methods of Analysis (4).
320 Biochemistry (3). Prerequisites: Chemistry 210-211-212, Chemistry 221, Chemistry 230 & 5 hours biology; concurrent registration on last two acceptable. f.
322 Biochemistry (3). Prerequisite: 320. w.

350 Chromatography (3). Prerequisite: one semester physical chemistry or instructor's consent.

375 Topics in Biochemistry (cr. arr.) Prerequisite: general biochemistry; others specified by instructor each semester course is offered.

400 Problems (1-6).

401 Plant Biochemistry (3). Prerequisite: 272 or 320-322 or 304 or instructor's consent. alt. f. odd yrs.

403 Topics in Biochemistry (2-3). Prerequisite: general biochemistry, other as specified by instructor each semester course is offered.

410 Seminar (1). f, w.

413 Reproductive Biology Seminar (1). f, w.

420 Chemistry of Enzyme Cofactors (3). Prerequisites: 8 hours organic chemistry; 8 hours biochemistry.

422 Analytical Biochemistry—Chromatography (2). Prerequisite: graduate standing or instructor's consent. f.

423 Analytical Biochemistry—Multiple Automatic Microanalysis (1). Prerequisite: graduate standing or instructor's consent. f.

424 Analytical Biochemistry—Mass Spectrometry (2). Prerequisites: two courses in organic chemistry, one course in physics, and instructor's consent. w.

450 Research (2-8).

461 Advanced Carbohydrate Metabolism and Biological Oxidations (2). Prerequisite: 304 or equivalent. alt. w. odd yrs.

462 Advanced Metabolism: Proteins and Nucleic Acids (2). Prerequisite: 304 or equivalent. alt. f. odd yrs.

463 Advanced Lipid Metabolism (2). Prerequisite: 304 or equivalent. f.

464 Physical Biochemistry: Proteins, Enzymes, Nucleic Acids (2). Prerequisites: 320 or equivalent and physical chemistry and differential integral calculus. w.

465 Advanced Metabolism: Amino Acids (2). Prerequisite: 304 or equivalent. alt. w. even yrs.

466 Regulation of Energy Metabolism (2). Prerequisite: 304 or 322 or equivalent. alt. w. odd yrs.

490 Research (cr. arr.)

CHILD HEALTH

A Pediatrics, Third Year (10). During the clinical years, an 8-week full-time clerkship is required. Students are assigned patients on the ward and newborn nursery and in the diagnostic outpatient clinics for independent history taking, examination, and clinical and laboratory evaluation, followed by discussion with a member of the staff. In addition to general pediatric clinics, subspecialty clinics are held in the fields of prematurity, diabetes, endocrinology, nutrition, gastroenterology, hematology, allergy, cardiology, neurology, and rheumatology. Clinical experience is supplemented by participation in daily conferences, lectures, and seminars.

B Pediatrics, Elective (10). All fourth-year students are encouraged to spend elective time in pediatrics. During this period there will be extensive exposure to everyday pediatric problems in the outpatient clinics, and a shorter period of intensive inpatient training, with increasing responsibility in both areas. Preceptorship with a practicing pediatrician, laboratory and clinical research, or a combination of these may also be arranged. These programs should not be confused with research fellowships which are available during the student's clinical years. Arrangements for such fellowships may be made through the department chairman.

P Postgraduate Instruction. Advanced post-

graduate instruction in pediatrics (both short-term programs, up to 4 years in duration) and residencies are available to qualified physicians by arrangement.

348 Human Genetics (3).

FAMILY AND COMMUNITY MEDICINE

A Community Health Preceptorship (10). Four-week assignment to a family physician in private practice.

Postgraduate Medical Instruction. A residency program in family medicine is offered to qualified physicians. Postdoctoral programs in medical faculty development in family medicine and social gerontology are offered.

25 Community Health (2). f, w. cor.

300 Problems (1-3). Prerequisite: instructor's consent. cor.

305 Introduction to Community Health Education (3). Prerequisite: senior standing.

315 Group Process in Community Health (2). Prerequisite: instructor's consent.

317 Planning for Change in Community Health (3). Prerequisites: senior standing and instructor's consent.

330 Statistical Aspects of Public Health (3). Prerequisite: concurrent registration in 420 or instructor's consent. f.

347 The Sociology of Community Health (3). Prerequisite: Sociology 1 or Rural Sociology 1.

350 Special Readings (1-3). Prerequisite: instructor's consent.

400 Problems (1-3). Prerequisites: graduate standing & instructor's consent.

410 Principles of Community Health Education (3). Prerequisite: f. graduate standing; w. senior standing and instructor's consent.

411 Methods in Community Health Education (3). Prerequisite: 410.

412 Planning for Change I (2). Prerequisites: graduate standing and instructor's consent.

415 Health Aspects of the Environment (3). Prerequisites: 330 & 420, or equivalent, or instructor's consent.

420 Principles of Epidemiology (3). Prerequisite: concurrent registration in 330 or equivalent, or instructor's consent. f.

421 Advanced Epidemiology (3). Prerequisite: 420 or instructor's consent.

422 Research and Evaluation in Community Health Education (3). w.

431 Statistical Epidemiology (3). Prerequisites: 330 & 420, or instructor's consent.

440 Public Health Administration (3). Prerequisites: 330 & 420, or instructor's consent. w.

441 Medical Care and Chronic Diseases (2). w.

443 Public Health Social Work (2). Prerequisites: 330 & 420, or instructor's consent. w.

444 Community Health in Developing Societies. (2-3). Prerequisites: 330 & 420, or instructor's consent. f.

449 Epidemiology of Zoonoses (3).

450 Research (cr. arr.)

490 Research (cr. arr.)

491 Field Experience in Community Health (cr. arr.) f, w, s.

492 Field Experience in Community Health Education (cr. arr.) Prerequisite: consent of community health education faculty.

MEDICINE

A Medicine, Third Year (15). Students are assigned to medical wards for 12 consecutive weeks of intensive instruction in basic internal medicine. During the first six weeks of the rotation emphasis is placed upon the fundamental skills of history taking, physical diagnosis and case presentation. Emphasis during

the second six weeks is on acquisition of a solid data base in internal medicine, development of skills in problem solving and clinical diagnosis, and principles of patient management and therapeutics. The level of student responsibility for patients increases as the rotation progresses. A thorough knowledge and understanding of all the patient's problems are stressed. Third-year students participate in daily patient-teaching rounds and a series of morning seminars which cover key topics in general internal medicine.

C Elective Medicine (15). Upon completion of the 12-week, third-year medicine rotation, the student is provided with a wide variety of clinical elective programs. Elective and/or free time may be spent in any of several areas, including: cardiology, dermatology, endocrinology, gastroenterology, geriatric medicine, hematology and immunology and rheumatology, infectious diseases, nephrology, and pulmonary medicine. In addition, there are extensive elective and free time opportunities available within the Department of Medicine for experiences in research. The director of the respective division should be contacted for details of opportunities available.

P Postgraduate Instruction. A fully accredited straight Internal Medicine residency program for three or more years is offered by the Department of Medicine. Fellowships are available after completion of residency in all major subspecialty areas.

MICROBIOLOGY

205 Fundamentals of Medical and Public Health Microbiology (4). f,w. Primarily for students in the School of Allied Health Sciences or School of Nursing.

301 Medical Microbiology (8). For graduate students and sophomore medical students. Prerequisite: organic chemistry; general bacteriology recommended. f.

304 Immunology (3). An introductory course that describes the chemistry and biology of antigens, antigen reactive cells, immunoglobulins, serology, immunity, autoimmunity, transplantation and tumor immunity. Prerequisites: organic or biochemistry. f.

314 Advanced Immunologic Techniques (3). Lecture and laboratory with primary emphasis on practical and theoretical aspects of modern immunologic techniques. Prerequisites: 304 or consent of instructor. w, odd.

315 Bacterial and Viral Genetics (4). Role of bacteria and viruses in study of molecular genetics. Prerequisites: course in microbiology and in biochemistry. w.

400 Problems (cr. arr.) Students assigned individual problems in microbiology for library or laboratory investigation. Prerequisite: strong background in microbiology. f,w,s.

401 Topics in Microbiology (cr. arr.) Current topics, highly specialized topics taught infrequently or courses taught by visiting professors.

402 Virology (4). Includes comparative survey of viruses, with emphasis on biochemical, biophysical and genetic nature of viruses and their interrelationships with their hosts. Lecture and lab. Prerequisites: medical microbiology and biochemistry. w.

403 Advanced Medical Microbiology (cr. arr.) Similar to 301 but treats medical microbiology and immunology in a more advanced manner. Methods of preparation and instruction stressed. Prerequisite: 301 or equivalent. f,w.

404 Pathogenic Mechanisms (cr. arr.) Pathogenic microbes, their toxins, virulence factors and interactions with the host. w.

405 Advanced Animal Virology (3). Replication, biological, biochemical and biophys-

ical properties of animal viruses. The subject material will be covered through lectures and discussion of the literature. w, even.

406 Medical Mycology (3). Covers the superficial, subcutaneous and systemic fungi pathogenic to man. Stress placed in lecture and laboratory on isolation and identification of the pathogens, as well as contaminant saprophytes. Prerequisite: medical microbiology. w, odd.

407 Advanced Immunology (2). Discussions and conferences emphasizing theoretical aspects of immunology and detailed considerations of the more involved areas of this science. Prerequisite: 304 or consent of instructor. w, even.

410 Seminar (1). Presentation and critical discussion of student and staff research, current literature, and guest lectures on subjects in various areas of microbiology. f,w.

490 Research (cr. arr.) Original investigation in various areas of microbiology and molecular biology related to bacteria, fungi, rickettsia, viruses and animal parasites, or immunology relating to antigens and antibodies of infectious and noninfectious nature. Designed for graduate thesis research. f,w,s.

NEUROLOGY

B Medical/Surgical Neurology (5). Fourth year students are assigned to the neurology wards for 5 weeks of instruction in the care of patients with medical and surgical neurologic diseases. Emphasis is placed on developing skills in history taking, neurologic diagnosis and case presentation. Attention is focused on learning the principles of neurologic diagnosis and on developing a core knowledge of diseases of the nervous system and general principles of caring for patients. The students participate in daily patient care/teaching rounds and a series of weekly lectures and conferences.

C Neurology Elective—Third and Fourth Years. Students who have completed Medical/Surgical Neurology may elect an experience in which the student participates in consultations rendered to other hospital services by the Department of Neurology. Additionally, elective opportunities exist for students at all levels after satisfactory completion of the first year of medical school. Details may be obtained from the chairman of the Department of Neurology.

OBSTETRICS AND GYNECOLOGY

A Obstetrics and Gynecology, Clinical Experience (10). Students are assigned to the clinical service in groups of varying size. Normal and complicated obstetrics and gynecology are taught by lecture, ward rounds, seminars and attendance in clinics, wards, delivery rooms and operating rooms. Weekly conferences with radiotherapy and pathology and seminars on maternal mortality, infertility and gynecologic endocrinology are held twice weekly.

B Obstetrics and Gynecology, Elective (10). Any student in the clinical elective period may make special arrangements with the department to do special work on a subject of interest.

P Postgraduate Instruction. Advanced graduate and postgraduate instruction in obstetrics and gynecology (both short-term and long-term, varying from 1 to 4 years) and residencies are available to qualified physicians by special arrangement.

OPHTHALMOLOGY

C Ophthalmology Elective—Senior Students—8 Weeks. Senior students who choose this elective are assigned to the service as

junior residents, so that they may take part in all clinical and teaching functions of the department.

P Postgraduate Instruction. The department is approved for a formal three-year residency training program.

PATHOLOGY

A Pathology Elective (10). Any medical student in the elective period may make special arrangements with the department to do research on a subject of interest.

P Postgraduate instruction. Advanced graduate and postgraduate instruction in pathology (both short term and long term, varying from 1 to 4 years), and residencies are available to qualified physicians by arrangement.

193 Cytology Female Genital Tract (10). Prerequisite: instructor's consent.

194 Respiratory Cytology (4). Prerequisite: instructor's consent.

195 Cytology of Body Fluids (4). Prerequisite: instructor's consent.

196 Gastrointestinal Cytology (4). Prerequisite: instructor's consent.

197 Oral Cytology (2). Prerequisite: instructor's consent.

198 Urinary Cytology (4). Prerequisite: instructor's consent.

199 Special Problems in Cytology (2).

200 Basic Pathology (2). Prerequisite: 5 hours biological science or equivalent and 5 hours chemistry or Physiology 201. w.

210M General and Clinical Pathology, Second Year (8). Prerequisite: first year Medical School or equivalent. f.

212M Systemic and Clinical Pathology, Second Year (8). Prerequisite: 210M or equivalent. w.

251 Interpretations of Lab Procedures in Primary Health Care (1). Prerequisites: graduate level physiology course and departmental consent. f.

310 General Pathology (5). Prerequisites: Biochemistry 206, Physiology 250; Anatomy 301, 302, 304, 305; & instructor's consent. f.

311 General Pathology Laboratory (3). Prerequisites: Biochemistry 206, Physiology 250; Anatomy 301, 302, 304, 305; or the equivalents; & instructor's consent. f.

312 Advanced Pathology (5). Prerequisites: 310 & 311 or equivalent & instructor's consent. w.

313 Advanced Pathology Laboratory (3). Prerequisite: 310 & 311 or equivalent & instructor's consent. w.

404 Advanced Pathology (cr. arr.) Prerequisite: instructor's consent.

430 Comparative Pathology (3).

491 Research (cr. arr.)

PHARMACOLOGY

130 Drugs and Behavior (3).

204 Elements of Pharmacology (3). Prerequisite: Physiology 201 or equivalent. f.

305 Topics in Pharmacology (cr. arr.) Prerequisite specified by instructor each semester course is offered.

320 Pharmacology (8). Prerequisites: 5 hours biochemistry & Physiology 305 or equivalent. w.

328 Principles of Toxicology (3).

330 Introduction to General Pharmacology (2). Prerequisites: general and organic chemistry and functional biology. f.

332 Pharmacology Laboratory (2). Prerequisites: 10 hours physiology & 5 hours biochemistry & 330 (may be taken concurrently) or equivalent.

334 History of Pharmacology (1). Prerequisite: 320 or equivalent. w.

400 Problems (cr. arr.)

410 Seminar (1). f,w.

420 Pharmacological Methods of Analysis (2). Prerequisites: Biochemistry 304 or 320, and instructor's consent. alt. f. odd yrs.

427 Fate of Drugs in the Animal Body (2).

431 Effects of Drugs on Enzymes (1). Prerequisite: 320 or equivalent. alt. f. odd yrs.

434 Pharmacodynamics of Autonomic Drugs (2). Prerequisite: 320 or equivalent. alt. f. odd yrs.

436 Pharmacodynamics of Cardiovascular Drugs (1). Prerequisite: 320 or equivalent. alt. f. odd yrs.

437 Endocrine and Metabolic Pharmacology (2). Prerequisites: Biochemistry 304, Physiology 305 or equivalent courses and instructor's consent. alt. f. odd yrs.

438 Neuropharmacology (3). Prerequisite: 320 or equivalent. alt. f..

450 Research (cr. arr.)

490 Research (cr. arr.)

PHYSICAL MEDICINE AND REHABILITATION

A Physical Medicine and Rehabilitation (5). A four-week clinical elective is available to develop an overall concept of restorative care and the principles of rehabilitation. Experience gained in working with the allied health professions in the delivery of comprehensive health care.

B Research in Physical Medicine and Rehabilitation (10). Original research requiring formal research report.

C Clinical Fellowship in Physical Medicine and Rehabilitation (10). Eight-week experience in the clinical practice of rehabilitation medicine for selected students. Prerequisite: clinical clerkship in physical medicine & rehabilitation.

D Medical Aspects of Vocational Rehabilitation (2).

PHYSIOLOGY

201 Elements of Physiology (5). Prerequisite: 5 hours general zoology or equivalent.

208 Human Physiology (3). Prerequisites: 201, Anatomy 201, or equivalent, and departmental consent.

240M Neurosciences I (5).

250 Medical Physiology (7). w.

305 Mammalian Physiology (6). Prerequisite: instructor's consent. w.

335 Systems Analysis of Physiological Processes (3). Prerequisite: 201 or an equivalent college-level biology course.

400 Problems (cr. arr.)

410 Seminar (1). f,w.

418 Advanced Mammalian Physiology (3). Prerequisite: instructor's consent. w.

420 Mammalian Membrane Physiology (3). Prerequisites: 305 or Veterinary Physiology 220V, 221V or Biol. Sci. 371 or equivalent. alt. summers.

430 Cardiovascular Physiology (2). Prerequisite: 305 or Veterinary Anatomy-Physiology 220V & Veterinary Anatomy-Physiology 221V or equivalent. alt. f. odd yrs.

439 Renal Physiology (2). Prerequisites: 305, Veterinary Anatomy Physiology 220V & Veterinary Anatomy-Physiology 221V or equivalent. alt. f. even yrs.

450 Research (cr. arr.)

490 Research (cr. arr.)

PSYCHIATRY

A Psychiatry, Third and Fourth Years (clinical clerkships) (10). Experience in the clinical study and care of psychiatrically disordered adults and children. Under supervision, students participate with increasing responsibility in selected activities of the psychiatric inpatient, outpatient, and liaison and consultative services, including work in

other departments of the hospital and affiliated public mental hospitals and community mental health agencies. Eight weeks full time during the third or fourth years; required for all medical students.

B Psychiatry Elective Third and Fourth Years (10). Special work in Department of Psychiatry on a subject of the student's choice, during the elective and free periods in the junior or senior year. Such work may include experience in additional clinical clerkship service; preceptorship under practicing psychiatrists in psychiatric hospitals, clinics or community mental health services; laboratory or clinical research; or a combination of these. Joint programs with other clinical or basic science departments can be arranged. Open to all students in third and fourth years. Subject to approval of department chairman and staff members who will supervise student's work.

P Postgraduate Instruction. A fully approved residency program in general and child psychiatry is offered to qualified physicians, with the University of Missouri-Columbia health sciences complex and the Mid-Missouri Mental Health Center providing facilities for academic and clinical training in all requisite phases of psychiatry. A

Master of Science program in community mental health and behavioral science is offered on an optional basis, and special third, fourth and fifth year academic fellowships are available in child psychiatry, community psychiatry, research and other sub-specialty areas. Individualized training permits flexible starting dates.

RADIOLOGY

A Radiology Elective (10). An eight-week elective assignment to the diagnostic section of the Department of Radiology to provide a clinical experience in the principles of radiographic examination and interpretation. Elective experiences are also provided in radiation therapy and nuclear medicine.

B Radiology Block. One-week assignment to department for practical experience on radiotherapy ward and in clinical radiotherapy practice, with optional time in diagnostic radiology.

P Postgraduate Instruction. Advanced graduate instruction of three years duration (with an elective fourth year) in radiology is available to qualified physicians. Instruction includes diagnostic, nuclear medicine and therapeutic radiology; radiopathology; and radiation physics. Special experience is pro-

vided for those interested in pursuing careers in teaching and research. Research Training Fellowships in academic radiology and its basic sciences also offered.

152 Treatment Planning (5).

153 Clinical Education in Radiation Therapy I (3).

154 Radium Therapy (2).

155 Radiation Therapy Pathology (2).

156 Clinical Education in Radiation Therapy II (3).

186 Radiation Therapy Physics (5).

201M Radiology (1).

227 Radioisotopes in Medicine and Biology (4). Prerequisites: Chemistry 11 & Physics 11 & instructor's consent. f.

328 Introductory Radiation Biology (3). Prerequisite: junior standing sciences/engineering; one course in biological sciences & physics/chemistry; or instructor's consent.

400 Problems in Radiological Science (1-3).

410 Seminar (1).

SURGERY

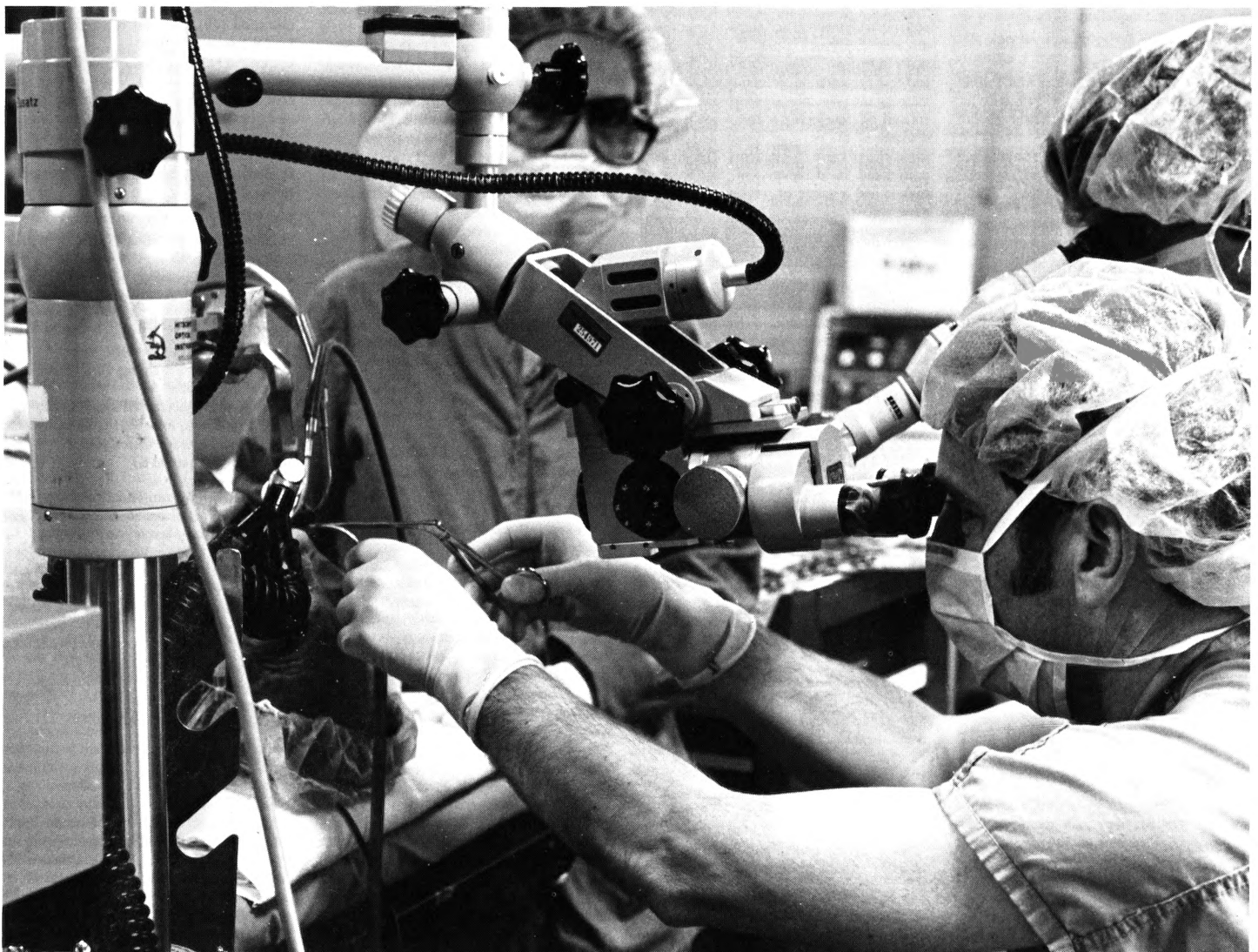
A Surgery Clerkship Block I (10). A required general surgical clerkship of 8 weeks is offered to students throughout the junior year. Emphasis is placed upon the principles of diagnosis and treatment of common surgical

disorders. Students are an integral part of the surgical team and participate in the preoperative examination and evaluation of patients, assist in surgical procedures and aid in postoperative management. Clinical responsibilities are increased in proportion to the student's knowledge and ability. Teaching rounds are supplemented by lectures, seminars and conferences.

B Surgery Clerkship Block II (5). A required surgical rotation of 4 weeks is offered to students who have completed Block I. Rotations are available in Orthopaedic Surgery, Otolaryngology, Plastic Surgery, Urology and Thoracic Surgery. The student is usually assigned to his/her first or second choice.

C Surgical Electives (5). Each of the surgical divisions offers electives in clinical and investigational surgery. These electives offer the student an opportunity to obtain an in-depth experience with close supervision.

P Postgraduate Instruction. Formal training programs are established in the following divisions of surgery: General Surgery, 5 years; Genito-urinary surgery, 5 years; Neurosurgery, 6 years; Orthopaedic Surgery, 5 years; Otolaryngology, 5 years; Plastic Surgery, 2 years; Thoracic Surgery, 2 years; and Vascular Surgery, 1 year.



FACULTY

SCHOOL OF MEDICINE ADMINISTRATION AND SUPPORT STAFF

Barbara S. Uehling, PhD, Chancellor
William D. Bradshaw, MD, Interim Dean, School of Medicine
Jerry A. Royer, MD, Associate Dean, School of Medicine; Associate Director, University Hospital and Clinics
Wallace A. Rogers Jr., MD, Interim Associate Dean for Education, School of Medicine
Douglas M. Griggs Jr., MD, Interim Associate Dean for Research, School of Medicine
Daniel H. Winship, MD, Associate Dean for Veteran's Affairs, School of Medicine; Chief of Staff, Harry S. Truman Veterans Administration Hospital
Robert B. Smith, MBA, Associate Dean for Hospital Affairs, Director of University Hospital and Clinics
Sandra McCurdy, MS, Admissions/Records Coordinator
Weldon Webb, MA, Interim Director, Continuing Education for the Health Professions
Merlyn C. Herrick, EdD, Director, Education Resources Group
Ronald M. McLaughlin, DVM, Director of Laboratory Animal Medicine
Dean Schmidt, MA, Director, Health Sciences Library

ANATOMY

David E. Scott, Chairman, Prof. PhD, Southern California
J. Harry Cutts, Prof. PhD, Western Ontario
William J. Krause, Prof. PhD, Missouri-Columbia
Willis K. Paull, Prof. PhD, Southern California
Edward W. Lowrance, Prof. Emeritus. PhD, Stanford
Milton D. Overholser, Prof. Emeritus. PhD, M.D., New York
Herbert E. Brown, Assoc. Prof. PhD, Utah
John D. Decker, Assoc. Prof. PhD, New York Upstate
Gary B. Dunkerley, Assoc. Prof. PhD, Texas (Medical Branch-Galveston)
Finley Gibbs, Assoc. Prof. PhD, Oregon
William R. Goode, Assoc. Prof. PhD, Washington
Barrie D. Smith, Assoc. Prof. PhD, Iowa
Larry Petterborg, Asst. Prof. PhD, Texas (San Antonio)
Kevin Rudeen, Asst. Prof. PhD, Texas (San Antonio)

ANESTHESIOLOGY

G.W.N. Eggers Jr., Chairman, Prof. MD, Texas
Herbert A. Ferrari, Prof. MD, University of Buenos Aires (Argentina)
Kenneth Keown, Prof. MD, Hahnemann
E. Scott McCord, Assoc. Prof. MD, Missouri-Columbia
Gary Blanchard, Instr. MD, Louisiana
Greg A. Love, Instr. MD, Missouri-Columbia
David E. Maltry, Instr. MD, Nebraska
Kareem Rasheed, Instr. MD, Bangalore Medical College (India)
Sameena Rasheed, Instr. MD, Coimbatre Medical College (India)

Robert H. Miller, Cl. Prof. MD
R. Louise Lowry, Cl. Assoc. Prof. MD
James Alyea, Cl. Assoc. Prof. MD
Thomas G. Johans, Cl. Asst. Prof. MD
Richard Sargent, Cl. Asst. Prof. MD

BIOCHEMISTRY

Milton S. Feather, Chairman, Prof. PhD, Purdue
Eric G. Brunngraber, Prof. PhD, Wisconsin
Benedict J. Campbell, Prof. PhD, Northwestern
George B. Garner, Prof. PhD, Missouri-Columbia
Charles W. Gehrke, Prof. PhD, Ohio State
Camillo A. Ghiron, Prof. PhD, Utah
Thomas D. Luckey, Prof. PhD, Wisconsin
Merle E. Muhrer, Prof. Emeritus, PhD, Missouri-Columbia
Boyd L. O'Dell, Prof. PhD, Missouri-Columbia
Edward E. Pickett, Prof. PhD, Ohio State
Douglas D. Randall, Prof. PhD, Michigan State
Arnold A. White, Prof. PhD, Georgetown
Robert L. Wixom, Prof. PhD, Illinois
John M. Franz, Assoc. Prof. PhD, Iowa
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