This is the M.D. Program section of the 1997-1999 University of Minnesota Medical School Bulletin.
M.D. Program

The Medical School provides the faculty and facilities for instruction of students in medicine. The primary goal of medical education is to produce physicians possessing sound training in quantitative human biology who have achieved mastery of the competencies requisite to entering graduate education in one of the primary care specialties. Beyond Medical School and awarding of the M.D. degree, all graduates are obliged, by requirements for specialization and/or licensure, to undertake additional formal education or training. And beyond these formal programs are the continuing education activities in which individuals in practice must participate to keep abreast of developments in medicine. Much of the success of the sequence of undergraduate-graduate-continuing education, called the continuum of medical education, is dependent on individual responsibility and initiative. Therefore, to encourage such development in medical students, the concept of the student as an independent learner is emphasized in the curriculum.

The course of study for the M.D. degree requires completion of 151 weeks of academic work in the Medical School.

The number of quarters in each year and the approximate calendar location are:

- Year One 4 quarters September—end of July (43 weeks required)
- Year Two 3 quarters September—early May (32 weeks required)
- Years Three and Four 8 quarters June—June (76 weeks required)

The first four quarters, termed Year One, include coursework in basic medical sciences, behavioral science, and introductory experiences with patients. The next three academic quarters of the core program, termed Year Two, consist of both department and integrated interdepartmental courses organized and taught along organ system and topical lines. Years Three and Four comprise a total of 76 weeks of academic requirements. Before beginning the Years Three and Four program, the student selects a faculty adviser and develops a plan for the two calendar years. For most students this period begins in June following Year Two and ends in June of the senior year, with graduation and awarding of the M.D. degree. This two-year program includes 52 weeks of required clinical courses: 12 weeks of internal medicine; 6 weeks each of surgery, obstetrics-gynecology, pediatrics, and psychiatry; 4 weeks of neurology, 4 weeks in one of the surgical specialties, and an 8-week outpatient clinical experience with 4 weeks in family practice and 4 weeks in either general medicine, general pediatrics, or geriatrics. The balance of the program includes two quarters (24 weeks) of electives and 20 weeks of free time. The curriculum outlined in the chart on page 29 depicts one of many possible arrangements of this two-year Years Three and Four portion of the M.D. program. Students must pass Steps 1 and 2 of the United States Medical Licensing Examination (USMLE) as a requirement for graduation and the M.D. degree. Students must pass the USMLE Step 1 to continue full-time work in Year Three.

Year One

Year One study is focused on structure and function of the human body and includes an introduction to the emotional and psychological development of the individual. Instruction begins with normal structure in anatomy and histology courses together with an integrated course in biochemistry, molecular and cellular biology that provides an in-depth study of modern concepts in this expanding field. In winter, spring, and summer quarters the focus shifts to the normal functions of body systems, reaction of the human organism to disease processes, and study of microorganisms and their relationships to humans and disease. These topics are presented in neuroscience, physiology, and microbiology courses, with clinical correlations as important components of each. Also in Year One there are courses in genetics, human sexuality, human behavior, and preventive medicine. In the summer, courses in pharmacology and pathology begin and continue through Year Two. A clinical medicine sequence extends throughout the entire year. It begins in fall quarter with an introduction to biomedical ethics, environmental medicine, and cultural diversity. In winter, spring, and summer quarters students learn communication skills needed to obtain a medical history and also physical diagnosis techniques.
The required courses in Year One are (quarter abbreviation follows in parentheses):

- Gross Anatomy (f, w)
- Human Histology (f)
- Biochemistry, Molecular and Cellular Biology (f)
- Human Nutrition (w)
- Medical Physiology (w, s)
- Neurosciences (w, s)
- Microbiology (w, s)
- Human Behavior (s)
- Human Sexuality (s)
- Human Genetics (su)
- Foundations of Preventive Medicine (su)
- Pathology (su)
- Clinical Medicine I (f, w, s, su)
- Pharmacology (su)

Students can establish an informal adviser relationship with a faculty member. The Year One program ends in late July and is followed by a four- to five-week vacation before the Year Two program begins the following September.

Year Two

The three-quarter sequence of Year Two begins in the fall and consists of lectures and laboratories in organ system pathology, pharmacology, and interdisciplinary courses in pathophysiology and practice tutorials in clinical medicine. The pathophysiology course examines the basis of disease mechanisms, signs, and symptoms through lectures, small group discussions, and assigned readings. Problem-based learning exercises are included in several organ system courses. Topics in pharmacology and pathology run concurrently in sequence with organ system pathophysiology.

The clinical medicine tutorials begin with a continuation of the general principles of history taking and physical examination begun in Year One. It is followed by four six-week tutorials in internal medicine, family practice, pediatrics, and neurology in which the student begins to learn the diagnostic skills used in these disciplines. During these tutorials students spend a full day each week evaluating and discussing assigned patients with their tutors.

The required program in Year Two consists of (credits in parentheses):

- Phcl 5111–Pharmacology (7)
- LaMP 5102, 5103, 5104–Organ System Pathology (10)
- InMD 5201–Pathophysiology I (13)
- InMD 5202–Pathophysiology II (10)
- InMD 5203–Pathophysiology III (11)
- InMD 5204–Pathophysiology IV (8)
- InMD 5290–Laboratory Medicine (1)
- InMD 5101–Clinical Medicine II (4)
- InMD 5102–Clinical Medicine: Internal Medicine (4)
- InMD 5103–Clinical Medicine: Family Practice (4)
- InMD 5104–Clinical Medicine: Pediatrics (4)
- InMD 5105–Clinical Medicine: Neurology (2)

Medical students Michelle Shariff and Anne-Marie Cole with Dr. Steven Nelson (center) consult with a patient.
Curriculum Outline

### Year 1 (Total 78 credits)

<table>
<thead>
<tr>
<th>Fall (1) — 14 weeks</th>
<th>Winter (w) — 10 weeks</th>
<th>Spring (s) — 9 weeks</th>
<th>Summer (su) — 6 weeks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clinical Medicine I: Ethics (2 cr)</td>
<td>CMI: History Taking (2 cr)</td>
<td>CMI: Physical Exam (s &amp; su-5 cr)</td>
<td></td>
</tr>
<tr>
<td>Gross Anatomy (f-8 cr, w-4 cr)</td>
<td>Neuroscience (w-3 cr, s-3 cr)</td>
<td>Human Sex (2 cr)</td>
<td>Genetics (2 cr)</td>
</tr>
<tr>
<td>Histology (7 cr)</td>
<td>Nutrition (1 cr)</td>
<td>Physiology (w-3 cr, s-4 cr)</td>
<td>Human Behavior (3 cr)</td>
</tr>
<tr>
<td>Biochemistry, Molecular and Cellular Biology (MDBC-9 cr, CBN-1 cr)</td>
<td>Microbiology (w-5 cr, s-5 cr)</td>
<td>Pathology (5 cr)</td>
<td>Pharm (2 cr)</td>
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</tbody>
</table>

### Year 2 (Total 75 credits)

<table>
<thead>
<tr>
<th>Fall (1) — 16 weeks</th>
<th>Winter (w) — 12 weeks</th>
<th>Spring (s) — 4 weeks</th>
<th>Board Review — 4 weeks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pathophysiology I, II &amp; III-Organ System (f-6 cr, w-3 cr)</td>
<td>Pharmacology (f-3 cr, w-4 cr)</td>
<td>Lab Med (w &amp; s-1 cr)</td>
<td>Board Review</td>
</tr>
<tr>
<td>Cardiovascular</td>
<td>Respiratory</td>
<td>Neurology</td>
<td>Psychiatry</td>
</tr>
<tr>
<td>Renal/Electrolytes</td>
<td>Endo/Repro</td>
<td>Psyche</td>
<td>Neurology</td>
</tr>
<tr>
<td>Gut</td>
<td>Blood</td>
<td>Lab Medicine</td>
<td>Psychiatry</td>
</tr>
<tr>
<td>ENT</td>
<td>Eye</td>
<td>Skin</td>
<td>Intern. Disease</td>
</tr>
</tbody>
</table>

### Year 3

<table>
<thead>
<tr>
<th>Summer — 12 weeks</th>
<th>Fall — 12 weeks</th>
<th>Winter — 12 weeks</th>
<th>Spring — 12 weeks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medicine</td>
<td>Ob/Gyn</td>
<td>Surgery</td>
<td>Elective</td>
</tr>
<tr>
<td>*</td>
<td>*</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>Pediatrics</td>
<td>Psychiatry</td>
<td>Free</td>
<td>*</td>
</tr>
<tr>
<td>*</td>
<td>*</td>
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<td>*</td>
</tr>
<tr>
<td>Neuro</td>
<td>Surg Specl</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Year 4 (Total 114 credits with Year 3)

<table>
<thead>
<tr>
<th>Summer — 12 weeks</th>
<th>Fall — 12 weeks</th>
<th>Winter — 12 weeks</th>
<th>Spring — 12 weeks</th>
</tr>
</thead>
<tbody>
<tr>
<td>*</td>
<td>*</td>
<td>*</td>
<td>*</td>
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<tr>
<td>Clin Med IV: Primary Care</td>
<td>Advanced Medicine</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>*</td>
<td>Elective</td>
<td>Free</td>
<td>*</td>
</tr>
<tr>
<td>*</td>
<td>Elective</td>
<td>Free</td>
<td>*</td>
</tr>
</tbody>
</table>

*The arrangement of courses, electives, and free time shown is one example of many possibilities.

**Required courses.

() Numbers indicate course credits. Letters indicate quarter.

### Years Three and Four

The student in Years Three and Four works to extend knowledge of medicine through full-time clinical work, participating in the care of patients in hospitals, clinics, and office practice settings. The student has three short-term goals during this period of clinical study: achieve competencies permitting entry to a specialty in primary care or other specialty training, select a specialty field for further and continued study beyond medical school, and prepare for the duties and responsibilities to be assumed in the first year of a residency program beginning after graduation from medical school.

The balance of the academic program required for the M.D. degree comprises 76 weeks of required work taken during the eight academic quarters in Years Three and Four. The schedule thus provides for 20 weeks of free time during Years Three and Four, which students may take as quarters or in smaller portions scattered throughout the two years. Planning the sequence of required courses and electives for the wisest possible uses of free time, while progressing toward long-term career goals, is an important activity, which requires the student to work closely with a faculty adviser and faculty in administrative positions in the Dean’s Office, as well as those coordinators who are responsible for programs in specialty and serial career opportunity offices.

The required courses in Years Three and Four are:

- Internal Medicine Externship I (6 weeks)
- Internal Medicine Externship II (6 weeks)
- Surgery Externship (6 weeks)
- Pediatrics Externship (6 weeks)
- Obstetrics and Gynecology Externship (6 weeks)
- Psychiatry Externship (6 weeks)
- Neurology (4 weeks)
- Surgical Specialty (4 weeks)
- Ambulatory Care Externship (8 weeks)
The remaining clinical work is individualized, relating specifically to personal interests and career goals. Courses are selected from an extensive list of elective courses offered by each Medical School department. With special permission, students may take a maximum of one quarter of credit in elective work at other medical schools in this country or abroad but must include at least 12 weeks of full-time elective clinical work in caring for patients in the affiliated metropolitan area hospitals and clinics as part of their total program. Students who have taken programs with coursework away from the metropolitan teaching hospital units are permitted less of such elective experience. The flexibility of the elective program provides an opportunity for all students to pursue creative interests and to further their professional growth through diverse experiences.

Students are eligible to begin the program in Years Three and Four upon completion of work in Year Two and after taking and passing Step 1 of the United States Medical Licensing Examination (USMLE). Students with any remaining academic deficiencies or those who do not pass Step 1 are reviewed by the Student Scholastic Standing Committee for a decision regarding arrangement of their remaining academic program. Each student’s Years Three and Four program is subject to review and approval by a student-selected adviser who will operate under general policy guidelines developed by the Years Three and Four faculty committee. Special programs, such as those combining the M.D. with the master’s degree, and special requests will be reviewed for approval by this committee.

Rural Physician Associate Program

Each year through the Rural Physician Associate Program (RPAP) of the Medical School, up to 40 third-year medical students, accompanied by their spouses and families, study primary health care in Minnesota communities under the experienced supervision of the community physicians, RPAP staff, and Medical School faculty, including many physician-preceptors who devote their time and resources to this unique medical/educational/community partnership.

November through July, these selected students work closely with community health care professionals. They learn through daily experiences the values, systems, and environment of patient care and medical practice in non-metropolitan settings throughout Minnesota. Since the inception of the RPAP in 1971, 823 medical students have participated in the program under the tutelage of experienced physician-preceptors in 102 Minnesota communities.

The RPAP office is located at 5-255 Phillips-Wangensteen Building, 516 Delaware Street S.E., Minneapolis, MN 55455 (612/624-3111; fax 612/624-2613; e-mail rpapumn@tc.umn.edu; Web site http://www.rpap.umn.edu/).

Evaluation and Academic Progress

Examinations and other methods, both subjective and objective, to evaluate performance of medical students, are administered by the various departments and interdepartmental teaching sections. All students will receive feedback regarding their performance on examinations. Each student has an opportunity for personal review of clinical work with a faculty supervisor. Written evaluations of each student’s clinical performance are submitted so that students may be informed of their educational progress and may take steps to improve areas in which deficiencies may exist.

Grades are reported as O (outstanding), E (excellent), S (satisfactory), I (incomplete), and N (no credit, fail). Selected courses are graded on a P-N (pass-fail) system, including all courses in Year One and Year Two. Students in the top 20 percent of the class for each of these year’s work receive a special letter of commendation that is placed in their official record. Students who receive I or N grades in courses are reviewed by the Student Scholastic Standing Committee. Opportunity for makeup work is one option that permits students to satisfy course requirements and continue their progress toward the M.D. degree. On admission to the program in medicine, students sign and pledge to abide by provisions of an honor code that is detailed in the Statement of Intellectual Responsibility. According to these provisions, the faculty does not monitor Medical School examinations, and students are strictly on their individual honor to
maintain ethical personal conduct during examinations. The statement is also a guide to professional conduct for medical students in their years in Medical School and beyond.

**Scholastic Standing and Dismissal**

Students may be dismissed from Medical School if, in the opinion of the Student Scholastic Standing Committee, they have not performed at a satisfactory academic level in individual courses or if there are other factors, such as personality, attitude, or emotional instability, that would prevent the individual from responsibly undertaking the duties of a physician.

**Graduation**

Requirements for graduation and award of the M.D. degree include satisfactory performance in all courses in the Year One and Year Two programs plus satisfactory completion of the Years Three and Four program, approved by an adviser and faculty group. Passing scores on Steps I and II of the United States Medical Licensing Examination (USMLE) must be earned. Final review and approval by the Student Scholastic Standing Committee must be obtained before a recommendation that the M.D. degree be granted by the Board of Regents.

Most students elect to graduate in June, just before beginning their specialty training. Students who wish to graduate in mid-year must make special arrangements through the Medical School Office of Admissions and Student Affairs.

**Combined M.D./Ph.D. Program**

This program is one of 33 national programs funded by a Medical Scientist Training Program grant from the National Institutes of Health. The program combines, in about seven years, coursework, fundamental biomedical research, and clinical training culminating in a dissertation, a Ph.D. degree, and an M.D. degree. Students accepted into the program receive a yearly stipend in addition to tuition remission throughout the training period. The program trains future academic physician/scientists. Note: A separate application is required and interviews are coordinated by the M.D./Ph.D. program office. For more information or an application, contact Susan Shurson, Combined M.D./Ph.D. Program, Box 293, 3-111 Owre Hall, 420 Delaware Street S.E., Minneapolis, MN 55455 (612/625-3680; fax 612/626-4200; e-mail mdphd@lenti.med.umn.edu; Web site http://www.med.umn.edu/mdphd/).

**Graduate Degree Programs in Biomedical Disciplines**

Students may also pursue the M.D. and Ph.D. degrees by enrolling in the Graduate School with a major in one of the basic sciences after completing some portion of the M.D. curriculum in the Medical School. Funding of stipends may be available for such students enrolled in the Graduate School even though not available while students are registered in the Medical School pursuing the M.D. degree. Information concerning this type of combined medical and graduate degree program can be obtained by contacting the Medical School Office of Admissions and Student Affairs or the individual department heads.

Under the aegis of the Graduate School, all the basic health sciences departments conduct active and extensive programs of graduate student research and study leading to the master’s or Ph.D. degree. Some research fellowships, teaching assistantships, or scholarships are available to academically qualified students for advanced study in these or other disciplines related to the biomedical and health sciences. Inquiry should be directed to a faculty member or the department office of the student’s field of interest.

More than 1,000 physicians are enrolled each year in post-M.D. graduate training programs (residency or clinical fellowship programs) in the clinical departments of the Medical School and its affiliated hospitals. These physicians are engaged in advanced training as specialists in their chosen medical or surgical fields. They have qualified for appointments and registration as medical fellow specialists in the Medical School or as medical fellows in the Graduate School and receive academic credit during their residency training.