

MEDICINE, DOCTOR OF (M.D.)

The program for the M.D. degree is divided into four phases. The Scientific Foundations of Medicine emphasizes the basic science concepts within a clinical context every student must master to progress with a medical education. The Applied Medical Sciences integrate basic science principles with pathophysiology and treatment using an organ-system approach. The last two years include the Clinical Concentrations and Advanced Clinical Concentrations. Students are expected to successfully complete clerkships in eight core areas in addition to advanced training that assesses their competency to practice with supervision. There are opportunities for students to enroll in electives throughout the clinical concentrations to enrich their medical experience and to assist them in planning a career within a specific field of medicine.

Admissions

medschool.vcu.edu/admissions (<http://www.medschool.vcu.edu/admissions/>)

The School of Medicine participates in the American Medical College Application Service. The AMCAS application forms can be obtained from AMCAS, 2450 N. St., N.W., Washington, D.C. 20037-1126. The electronic application is available on the AMCAS website (<http://www.aamc.org/students/amcas/>). Updated information is available at the School of Medicine website (<http://www.medschool.vcu.edu>). Application for the School of Medicine should be made during the first week of June of the year preceding intended matriculation. Letters of recommendation can now be submitted with the AMCAS application.

The closing date for filing applications for this institution is Oct. 15 of the year preceding the enrollment date. Priority for admissions is given to Virginia residents; however 45 percent of each class is from out of state. Members from disadvantaged populations are encouraged to apply to the School of Medicine. Students previously dismissed from a medical school will not be considered. All applicants must be U.S. citizens, permanent residents of the U.S. or Canadian citizens at the time of application. Permanent residents must submit their cards prior to file review.

A nonrefundable \$80 application fee and supplemental information, including letters of recommendation, are required with all applications accepted for further consideration. The final date for returning supplemental information is Jan. 31 of the year of possible enrollment in the School of Medicine. Students are given individual deadlines which are 60 days from the date the Supplemental Application is granted.

The School of Medicine will not matriculate students from other health sciences schools at VCU or any other school until such students have completed the degree program for which they are enrolled.

The School of Medicine participates in the Early Decision Plan. This program permits an applicant to file a single application through AMCAS by Aug. 1. All applicants filing under the Early Decision Plan will receive consideration for admission and a response on or before Oct. 1. All applications for the Early Decision Plan must be supported by the results of the new MCAT test at the time the application is made.

The early notification date of this plan ensures that those who are unsuccessful have ample time to request further distribution of their applications to other medical schools. Further information on the Early Decision Plan is available with the AMCAS application.

Requirements for entrance

The MCAT is required as part of the application. It is necessary that the test be taken no later than September of the year of application. This test is produced by the American College Testing Program, P.O. Box 414, Iowa City, IA 52240, and is administered in colleges and universities throughout the country. Information about the MCAT is available through premedical advisers or directly from the American College Testing Program.

Applicants may be admitted on the basis of 90 semester hours of outstanding achievement. The majority of successful candidates have a college degree at the baccalaureate level or higher. The college major for premedical students should be selected in accordance with the individual student's aptitude and interest. The prerequisites for the School of Medicine have been reduced to a minimum in order to permit the widest possible latitude in preparation for medical education.

Prerequisites for admission include a minimum of 90 semester hours (or the equivalent) in a U.S. or Canadian college or university accredited by the regional accrediting agency. This program of study must include a minimum of:

1. English – two semesters (one semester to include grammar and composition);
2. College mathematics – two semesters;
3. Biological science – eight semester hours, including laboratory experience. This requirement may be satisfied by general biology, general zoology or botany. No more than half may be botany;
4. General or introductory chemistry – eight semester hours, including laboratory. An appropriate portion of this requirement may be met by courses in analytical chemistry or physical chemistry;
5. Organic chemistry – eight semester hours, including laboratory. This course should be equivalent to and acceptable for continued studies in a chemistry major;
6. General or introductory physics – eight semester hours, including laboratory experience.

Students are encouraged to pursue their own intellectual interests in college in order to obtain a broad education consistent with their major program. Courses in medically related science areas will not relieve the student of his/her responsibility for these subjects in the medical curriculum.

Selection factors

Demonstrated academic ability, as well as attributes of character and personality, are of significance to the admissions committee in the selection process. A review of academic achievement as represented by the standard academic record and summaries, MCAT scores, evaluations and interviews are all sources of information on which the comparative evaluation process is based. A review of the completed application file and interviews with members of the admissions committee are an integral part of the admissions process.

Noncognitive variables also are sought in all candidates. These qualities include, but are not limited to, health care experience, community service and social concern, communication skills both written and oral, leadership, ethical and moral behavior, creativity, compassion and empathy, altruism, personal maturity, self-confidence without arrogance, appropriate motivation, the ability to realistically self-appraise, and a demonstrated ability to work as a team member. These qualities and characteristics are judged by references within the letters of recommendation and from a careful review of the student's essays and extracurricular activities, as well as the interviewers' assessment

during the interview. The School of Medicine hopes to create a learning environment where students will meet colleagues whose life experiences and views differ significantly from their own. A physician must be at home and at ease in a wide variety of environments and with a wide variety of people. Students frequently comment that the aspect of the school they appreciate most is the diversity of their class. The admissions process seeks to foster that diversity of perspective and background by admitting students from a wide range of backgrounds — socioeconomic, cultural, geographic and educational. Health care experience is also examined as a true evaluation of the motivation of the candidate for a career in medicine.

The interview is an opportunity for the applicant to become acquainted with the institution and it offers additional information for the selection process. Only on-campus interviews in Richmond are available. Each year more applicants are interviewed than can be accepted in the class. Therefore, an interview is not an indication of acceptance to the School of Medicine.

Offers for admission are made in the Early Decision Plan on Oct. 1 and on the uniform acceptance date after Oct. 15, with admissions occurring at several points thereafter until the class selections have been completed. The approximate dates for acceptance decisions are Oct. 16, Dec. 15, Feb. 1 and March 15. At the time the class is filled, an alternate list of applicants is compiled from which replacements are drawn for any vacancies that may occur in the selected class between notification and the third week of class attendance.

Since selections are made in advance of actual attendance, all acceptances are made on condition of satisfactory completion of courses planned or in progress. It is expected that candidates will maintain acceptable standards of deportment. Students offered acceptance into a class are expected to respond within two weeks of the offer. If such a response presents a problem, extension of the time for the response should be requested. After March 31, students are selected from a wait list of very good candidates until the first day of orientation in August.

The enrollment of accepted candidates is considered complete only after payment of the \$100 deposit toward the first tuition payment. This deposit will be returned to the candidate should withdrawal occur prior to May 15 of the year of attendance. By the act of matriculation into the School of Medicine, the student accepts the responsibilities related to this opportunity and agrees that during the time that he/she is a registered student he/she will follow the rules and regulations established by the governing bodies of the School of Medicine and the university.

Transfer in advanced standing

The VCU School of Medicine does not typically consider applications for transfer admission. In the rare instance where a transfer student would be considered, the student must demonstrate rare and extraordinary personal or educational circumstances. Applicants for transfer admission will only be considered for transfer into the clerkship (M3) year of the curriculum.

Application

In instances where there are demonstrable rare and extraordinary personal or educational circumstances, applicants for transfer must also meet the following criteria in order to be considered for admission:

- Demonstrate a compelling reason to be at the VCU School of Medicine

- Be transferring from an LCME-accredited medical school
- Be in good academic and professional standing within their current medical school
- Have the written approval of the dean of the transferring institution
- Have premedical and medical school credentials comparable to those of students in the class they will join

Students who meet the defined criteria should submit a letter to the SADA describing the compelling reason for the requested transfer no later than Sept. 1 prior to the start of the anticipated enrollment. If the student meets criteria for transfer, the SADA will confer with the SADMESA to determine if there is availability to accommodate an additional learner.

Acceptance

To be accepted for transfer into the first clinical (clerkship) year, students must have successfully applied as above and subsequently meet the following criteria:

- Successfully completed all preclinical course work at an LCME-accredited medical school
- Passed Step 1 of the USMLE licensing examination

It is a rare circumstance to have positions available for transfer. If there are more acceptable candidates than positions, selection will be based on the strength of the application. The decision of a transfer application is at the discretion of the Admissions Committee after consultation with the SADMESA regarding equivalency of educational experiences and clinical availability.

Disability support services

Virginia Commonwealth University in agreement with Section 504 of the Rehabilitation Act of 1973 and The Americans with Disabilities Act of 1990 provides reasonable accommodation to any individual who advises us of a disability. We wish to provide new and current students who have a disability the opportunity to voluntarily identify themselves.

Early identification permits the Division for Academic Success the opportunity to acquire verification of the disability, if required, and the opportunity to get appropriate accommodations in place as soon as possible. All accommodations request are handled on an individual basis. Examples of some accommodations are; extended test taking time, alternative testing format, note takers, readers, scribes, quiet testing area, sign language interpreters, assistive technology and computer software programs which are located in the library for student use.

If you are an individual with a disability and wish to identify yourself as such, please contact the Division for Academic Success. It is important to note that all disclosures are confidential and are released only with your permission. A comprehensive VCU Handbook for Students with Disabilities is available upon request. **Be sure to include your name, address and phone number if you write.** We also are available to answer questions about accommodations and services.

Mail: Director, VCU Division for Academic Success, Box 980124, Richmond, VA 23298-0124; phone: (804) 828-9782 or VTDD (804) 828-4608; FAX (804) 828-4609; or das.vcu.edu (<http://das.vcu.edu/>)

Medical education curriculum

The curriculum for the M.D. degree is divided into four phases:

- Scientific Foundations of Medicine
- Applied Medical Sciences
- Clinical Concentrations (also called Clerkships)
- Advanced Clinical Concentrations

In addition, there are multiple longitudinal courses throughout the curriculum:

- Diagnostic Reasoning (pre-clinical phase)
- Geriatrics Education
- Interprofessional Education
- Physician, Patient and Society
- Point of Care Ultrasound (pre-clinical phase)
- Population Health and Evidence-based Medicine
- Practice of Clinical Medicine (pre-clinical phase)
- Telehealth (clinical phase)

M1: The Scientific Foundations of Medicine – These sections comprise the first semester and provide the foundational knowledge of the basic sciences necessary for the practice of medicine.

- Molecular Basis of Health and Disease (Biochemistry and Genetics)
- Fundamentals of Physiology
- Principles of Autonomics and Pharmacology
- Infection and Immunity (Microbiology and Immunology)
- Foundations of Disease

M1-M2: Applied Medical Sciences – These sections are taught during the second and third semesters. Using an integrated, organ-system approach, normal functioning is taught in tandem with disease and its treatment.

- Marrow (Hematology/Oncology)
- Movement (Musculoskeletal Systems) and Anatomy
- Gastrointestinal and Anatomy
- Endocrinology
- Reproduction and Anatomy
- Cardiovascular
- Pulmonary
- Renal
- Neurosciences
- Behavioral Sciences
- Anatomy Rounds

M3-M4: Clinical Concentrations – Covering the remaining two and one-half years, the clinical concentrations include traditional clinical clerkship training, electives and advanced clinical training in field(s) of interest. Scheduling flexibility permits students to intersperse elective opportunities immediately to promote exploration of career interests and maximize individual learning needs. Specialty-specific choices such as electives and advanced clinical training opportunities are selected with the guidance of a specialty adviser. All students complete eight core clerkships, two acting internships and a variety of electives related to speciality interests:

- Core clerkships
 - Ambulatory (4 weeks)
 - Family medicine (4 weeks)
 - Internal medicine (8 weeks)
 - Neurology (4 weeks)

- Obstetrics/gynecology (6 weeks)
- Pediatrics (6 weeks)
- Psychiatry (4 weeks)
- Surgery (8 weeks)
- Advanced clinical training
 - Inpatient acting internship (4 weeks)
 - Critical care acting internship (4 weeks)
- Specialty-driven electives
 - Foundational (up to 4 weeks in clerkship phase)
 - 48 weeks of electives (28 weeks minimum of clinical elective time/20 weeks maximum on non-clinical elective time)

Transition courses: Each phase of the curriculum commences with a transition course. The Transition to Medical School course is as a comprehensive introduction to the expectations and responsibilities inherent in the medical profession. Over a two-week period, students gain essential insights into curricular requirements, faculty, teamwork dynamics, support services and facilities. The Transition to M3 course is a comprehensive three-week course featuring instructional sessions and simulation exercises aimed at equipping students for the challenges of the clinical setting and the academic demands of the clerkship year. The Transition to M4 course occurs before the commencement of clinical electives and acting internships at the start of the fourth year of the curriculum. This course focuses on topics and skills necessary to successfully navigate the required components of the M4 year. Sessions include topics on ICU management, electrolyte emergencies, transitions of care, escalation of care and calling consultants. As part of their final preparations for graduation, students engage in the Transition to Residency course, which will prepare students for a successful intern year in their respective residency programs.

Geriatrics education: Developed using the core competencies as defined by the American Geriatrics Society and the Association of American Medical Colleges, this four-year curriculum includes interactive case-based sessions, patient and caregiver panels and online case simulation. By the end of M4, students will be able to evaluate older patients that exhibit acute and chronic illness in a manner consistent with the patients' prognosis, values and goals. The management of older patients will be informed by a core-defined knowledge of age-related changes in human biology and pharmacology, as well as systems of care. Students also learn how to manage common geriatric syndromes and conditions, including (but not limited to): delirium, dementia, immobility, falls, under-nutrition, polypharmacy, pre- and post-operative complications, social isolation, failure to thrive, discharge planning, and elder abuse.

Practice of Clinical Medicine: This longitudinal course begins the first week of medical school where students participate in an intensive "boot camp" to learn the essentials of obtaining a history and physical examination. The week culminates with students performing their first complete history and physical examination on a standardized patient. Throughout the first two semesters, students learn to develop communication skills, how to ask patients about specific types of historical information and detailed organ-specific examinations. Students practice these skills using standardized patients in our state-of-the-art simulation center. The third semester, students are placed with community preceptors to practice these skills with actual patients.

Physician, Patient and Society: This course encompasses the humanistic, ethical and legal responsibility of physician to their patients and society. Topics covered include the physician-patient relationship, integrative/complementary medicine, palliative care, spirituality, health disparities,

physician bias and cultural competency, and the practical application of ethics and law to the practice of medicine.

Population Health and Evidence-based Medicine: During the first three semesters, students develop an understanding of the determinants of health such as socioeconomic, educational and environmental circumstances, the assessment and measurement of health status at the population level, the ability to effectively evaluate the quality of medical literature, and biostatistics. During the clerkship phase, the course focuses on the application of prior knowledge in analyzing evidence which contributes to decision-making in patient care.

Interprofessional Education: This course involves learners from the various health professions schools. Introductory course work encompasses topics such as team formation, defining quality, improving quality, leadership, complexity and error, measuring error, error-prevention tools and techniques, and an independent quality/safety improvement project. During the clinical and advanced clinical concentrations students will study and analyze in real time the impact of safety/quality improvement projects within the various health systems where clinical rotations are performed.

Ultrasound: The VCU Point-of-Care Ultrasound course is a longitudinal course throughout the pre-clinical curriculum. The course gives students the opportunity to learn bedside clinical ultrasound at the same time they are learning basic physical exam and history skills in their Practice of Clinical Medicine course. The course consists of sessions with ultrasound-trained practicing clinical faculty that provide direct feedback and guidance to the learner. Each session will have a standardized patient to scan, and pathology will be discussed or displayed on the simulators.

Diagnostic Reasoning: An 18-month longitudinal course that has two distinct but related purposes: 1) to help medical students prepare for M3 and beyond by honing their critical-thinking and diagnostic skills by building their differential diagnosis capabilities and 2) to help prepare for Step 1 examination by both improving critical-thinking skills and making the student practice with USMLE-style multiple choice questions. Students interview a standardized patient to obtain the pertinent histories and then utilize the case system to “order” physical exam and diagnostic studies to go from their broad differentials based on history alone, and narrow down to a final diagnosis and two plausible diagnoses that they have ruled out using their exam and diagnostic studies. Students also form clinical questions about their cases utilizing medical literature.

Telehealth: Telehealth is both the present and future of medicine. Prior to the COVID-19 pandemic, there were already advances in the delivery of virtual health care. With the emergence of COVID-19, those advances were accelerated, and this included the involvement of learners in telehealth delivery. In recognition of the increased need for telehealth, the AAMC has developed telehealth competencies that span the spectrum from new graduate to experienced physician. During the clerkship phase of the curriculum, students participate in telehealth visits as well as attend lectures that address updates in telehealth regarding initiatives to address disparities, regulatory and legal requirements, or other emerging issues, and additional opportunities for skill sessions practice.

U.S. Medical Licensing Examination

All students are required to pass the U.S. Medical Licensing Examination Step 1 prior to the start of the clinical concentrations (clerkships).

Students who do not pass the examination on the first attempt will be placed on a leave of absence. During this time the student will be allowed two additional attempts to pass the examination. Failure to pass the examination after three attempts will result in immediate dismissal. Students who fail Step 1 on the first attempt may request additional financial aid to take a commercial board preparation course. These funds will be granted one time only.

All students are required to take the USMLE Step 2 CK for the first time after completion of their core clerkships or by the annual established date by the Office of Medical Education. Failure to do so will result in dismissal. Students are required to pass USMLE Step 2 CK for graduation. Students are allowed three attempts to pass Step 2 CK. If they do not pass by the third attempt, they will be automatically dismissed.

Withdrawal from the School of Medicine

Students may withdraw after meeting with the senior associate dean for medical education and student affairs and submitting a letter requesting withdrawal.

Requirements for graduation

The VCU School of Medicine has established the following requirements students must satisfy in order to complete the Doctor of Medicine (M.D.) program.

Advancement to the clinical curriculum

To progress to the core clerkships and electives in the M3 year, students must:

- Pass all courses in the Scientific Foundations of Medicine phase of the curriculum
- Pass all courses in the Applied Medical Sciences phase of the curriculum
- Pass the USMLE Step 1 Exam

Advancement to graduation for the M.D. program

Candidates for graduation from the four-year curriculum must:

- Pass all required and elective coursework in the four-year curriculum
- Complete and log all required clinical experiences
 - Specific requirements regarding the required clinical experiences that must be logged prior to graduation can be found in the Completion of Required Clinical Experiences Policy.
- Be in good academic standing
- Pass specified qualifying examinations including USMLE Step 1 and Step 2 CK
- Satisfactorily complete VCU CSE
- Satisfactorily complete required curricular experiences
- Demonstrate satisfactory compliance with the Technical Standards for Medical Students, including exhibiting the professional characteristics expected of a physician
 - Specific requirements regarding technical standards can be found in the Technical Standards for the M.D. Program Policy.
- Adhere to all VCU SOM and university policies

Competency-based graduation track

Candidates for graduation from the three-year CBG curriculum must:

- Pass all required and elective coursework in the three-year CBG curriculum
- Complete and log all required clinical experiences
 - Specific requirements regarding the required clinical experiences that must be logged prior to graduation can be found in the Completion of Required Clinical Experiences Policy.
- Be in good academic standing
- Pass specified qualifying examinations including USMLE Step 1 and Step 2 CK
- Satisfactorily complete VCU CSE
- Satisfactorily complete required curricular experiences
- Demonstrate satisfactory compliance with the Technical Standards for Medical Students, including exhibiting the professional characteristics expected of a physician
 - Specific requirements regarding technical standards can be found in the Technical Standards for the M.D. Program Policy.
- Adhere to all VCU SOM and university policies

VCU's clinical skills exam

All students are required to take and pass a CSE at the beginning of the fourth year of medical school to assess the core clinical skills of communication, data collection (history and physical exam), clinical reasoning (differential diagnosis, diagnostic therapeutic plan) and other institutional learning objectives. A passing score on this exam is required for graduation, and failure of this exam requires remediation, which may include retaking the exam.

Time to completion of requirements

Students must complete all required components to advance to graduation within six years of initial matriculation, including any academic leave of absence.

Sample plan of study

Course	Title	Hours
M1 year		
Fall semester (MEDI 100)		
Transition to Medical School		
Practice of Clinical Medical Bootcamp		
Molecular Basis of Health and Disease		
Principles of Physiology		
Principles of Autonomics and Pharmacology		
Immunity and Infection		
Foundations of Disease		
Practice of Clinical Medicine		
Patient, Physician and Society		
Population Health and Evidence Based Medicine		
Ultrasound		
Diagnostic Reasoning		
Geriatrics		
Spring semester (MEDI 150)		
Marrow (Hematology / Oncology)		
Movement (Musculoskeletal)		
Gastrointestinal		
Endocrine		
Reproduction		
Practice of Clinical Medicine		

Patient, Physician and Society

Population Health and Evidence Based Medicine

Ultrasound

Diagnostic Reasoning

Geriatrics

IPEC 502	Interprofessional Quality Improvement and Patient Safety	1
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M2 year

Fall semester (MEDI 200)

Cardiovascular

Pulmonary

Renal

Neuroscience

Practice of Clinical Medicine

Patient, Physician and Society

Population Health and Evidence Based Medicine

Ultrasound

Diagnostic Reasoning

Geriatrics

Spring semester (MEDI 250)

Behavioral Sciences

Practice of Clinical Medicine

Step 1 Study

M3 year

Fall and spring semesters (MEDI 300)

M3 Transition to Clerkships

Internal Medicine Clerkship

Surgery Clerkship

OB/GYN Clerkship

Pediatrics Clerkship

Family Medicine Clerkship

Neurology Clerkship

Psychiatry Clerkship

Ambulatory Clerkship

Foundational Career Exploratory electives

Patient, Physician and Society

Population Health

Telehealth

M4 year

Fall and spring semesters (MEDI 400)

Transition to M4 - Clinical Concentrations

Two acting internships, one ward and one critical care (four weeks each)

Step 2 Clinical Knowledge exam

28 weeks of clinical electives

Up to 20 weeks of non-clinical electives

Patient, Physician and Society

Interprofessional Critical Care Simulations

IPEC 561	IPE Virtual Geriatric Case	2
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Transition to Residency

The competency-based graduation program allows students to complete the medical curriculum in three years instead of four and gain a head

start in the chosen specialization. The program assesses competency through rigorous assessments of entrustable professional activities and specialty-specific milestones. In addition to a continuum of education, training and practice, goals of implementing a three-year graduation program include the reduction of student debt and retaining students at VCU Health who will ultimately practice medicine in Virginia. Having students rapidly enter the workforce will aid in the impact of the impending physician shortage.

Students may express interest in the program at the end of the first year of medical school. Students are selected for the program through a rigorous review process including assessment of pre-clinical grades; audit of feedback from patient encounters, preceptors and small group leaders in the Practice of Clinical Medicine course; an interview with the specialty residency director; and an essay of interest. Approximately halfway through the third-year clerkship phase, there will be an intensive review to determine if the student is on track with their competency achievement to be able to graduate after their clerkship year (May of their third year or summer of their fourth year.) The student will apply to VCU Health or a VCU Community Family Medicine residency program and enter the match in December of their third year.

Students accepted into the competency-based graduation program follow the same third-year curriculum with the exception of the foundational elective period being replaced by the fourth-year acting internship requirement and the first block of the traditional fourth year is replaced with a critical care elective. Students are assigned to a specialty coach with whom they meet regularly to review assessment data as well as set and achieve performance and wellness goals. Students also complete the Step 2 Clinical Knowledge and Clinical Skills exams in the third year instead of the fourth.

The goal of the program is multifaceted in that it will 1) attract high-achieving students to the VCU School of Medicine, 2) improve the transition from undergraduate medical education to graduate medical education through a transparent handover including the coach, program director and student, 3) retain high-achieving students as residents at VCU Health and 4) address the physician shortage in that students who remain in Virginia for residency are more likely to stay and practice in the state.

VCU's School of Medicine participates in the Consortium of Accelerated Medical Pathway Programs, which includes more than 25 medical schools that offer an accelerated curriculum.