MEDICINE, DOCTOR OF (M.D.)/ HEALTHCARE POLICY AND RESEARCH, DOCTOR OF PHILOSOPHY (PH.D.) [DUAL DEGREE]

Graduate study in healthcare policy and research in the School of Medicine is a highly individualized undertaking and required course work represents only one component. Each student's program is tailored to meet his or her particular interests, with the primary emphasis on developing research skills and the capacity for independent scholarship and with the recognition that career goals for many M.D.-Ph.D. physician-scientists are distinct from those of most Ph.D. trainees.

Program goals

The objectives of this dual degree program are:

- Students in the M.D.-Ph.D. program in healthcare policy and research will acquire the foundational skills to allow them, after further clinical specialty and postdoctoral research training, to become independent physician-scientists. Program graduates ultimately pursue careers in academic medicine, government agencies, research institutes, and the pharmaceutical industry as clinicians, scientists, educators and administrators.
- Students will gain a progressive mastery of concepts in health services research and related disciplines, including economics, statistical methods, decision sciences, organizational theory and public health domains. They will gain an understanding of the current state of research investigations in the field, an ability to synthesize information and apply foundational concepts to identify key areas for innovative investigation and experimentation, and the knowledge to design, execute and interpret research studies, publish findings in peer-reviewed journals, and disseminate reports and policy briefs that address the questions identified.
- Students will develop skills in various means of communicating core knowledge in the field and the details of experimental design, results, and interpretation to a variety of potential audiences.

Among the many benefits offered by participation in the dual-degree program are the following:

- Students will have the foundation and training in healthcare policy and research and in medicine to conduct basic and translational research that will enable them to take bedside observations to inform policy research and practice, as well as apply the results of policy research and practice to the bedside to advance both the underlying science and patient health.
- Students have the opportunity to participate in clinical research during the M4 year.
- Students with M.D.-Ph.D. training are highly competitive for positions in leading physician-scientist clinical training programs, faculty positions in academic medical centers, and are well-positioned to ultimately take on leadership roles in academic medicine, industry and government.
- Tuition, fees and a stipend are provided throughout both the medical and graduate phases of training.

The diplomas for this dual degree program are awarded simultaneously upon completion of the requirements for both degrees.

Student learning outcomes

The student learning outcomes described on the healthcare policy and research Ph.D. program page (http://bulletin.vcu.edu/graduate/school-medicine/healthcare-policy-research-phd/) also apply to M.D.-Ph.D. students.

Admission requirements

To be considered for the VCU M.D.-Ph.D. program, prospective students must apply to the medical school through the American Medical College Application Service (https://students-residents.aamc.org/applying-medical-school/applying-medical-school-process/applying-medical-school-amcas/). Please designate "Combined Graduate/Medical Degree" on your AMCAS application. The deadline for application to the program for admission in the fall semester is listed on the AMCAS web site.

In rare situations when resources allow, students matriculated in the medical school class may be considered for admission to the M.D.-Ph.D. program, usually near the start of the M1 academic year. For additional details, see the M.D.-Ph.D. dual degree opportunities page (http://bulletin.vcu.edu/professional-studies/medicine/md-phd-opportunities/).

Degree requirements

The dual-degree program is designed to allow students to complete the first two-years of medical school and the USMLE Step 1 examination (M1, M2) before undertaking graduate training (G1 and subsequent years). After successfully defending the Ph.D. dissertation, students complete the remaining clinical years (M3, M4) of medical training. Nevertheless, important aspects of dual-degree training are integrated across the program. These include M.D.-Ph.D. specific graduate courses during M1 and M2 that supplement the medical curriculum and emphasize research and translational aspects of M.D. course topics and required M3 clinical rotations integrated into the graduate phase. Opportunities for research experience begin prior to entering the graduate phase (pre-matriculation and summers after M1 and M2), when students spend time working in several faculty laboratories of their choice. These laboratory rotations enable students to examine faculty research projects, experimental approaches and laboratory environments, and to select an area for specialization. After completing M2, students are required to take the USMLE Step 1 exam, followed by one or two required M3 clinical rotations lasting six to eight weeks total. They then transition into graduate studies.

During the first two year of graduate training (G1 and G2), students take graduate courses selected to optimize their training and devote time to independent research under the guidance of a faculty adviser. Additionally, it is expected that M.D.-Ph.D. students engage in 20 hours per week of mentored research under the direction of the faculty adviser in order to build the skills necessary to successfully complete their dissertation-related research in years G3+. On satisfactory completion of course work, students must pass written and oral comprehensive examinations to qualify for degree candidacy. At the end of G2, students will take a written comprehensive examination designed to evaluate the student's ability to:

- Integrate course material
- Demonstrate critical thinking and evaluation of the literature in healthcare policy and research
- Demonstrate quantitative analysis skills

After passing the written comprehensive examination, the student will schedule the proposal defense within six months. Following successful defense of the proposal, the student will prepare three manuscripts of publishable quality that will comprise the body of the dissertation and will orally defend the dissertation. During G3 and subsequent years, most effort is devoted to dissertation-related research.

In addition to completing VCU School of Medicine requirements for the M.D. degree and the general VCU Graduate School graduation requirements (http://bulletin.vcu.edu/academic-regs/grad/graduation-info/), students must maintain a minimum cumulative GPA of 3.0 and must receive a minimum grade of B for all required courses. A student who receives a grade of C in a required course shall repeat the course. A second grade of C in a required course may result in dismissal from the program. At the discretion of the HCPR committee, a student who is retaking a required course may still be eligible to take the comprehensive examination and to start the dissertation prior to repeating the course. M.D.-Ph.D. students must complete a minimum of 59 credit hours for the Ph.D., including directed research.

Department-sponsored seminars and other activities give students opportunities to discuss their research interests with visiting scientists and to present their research both internally at national professional meetings.

The Ph.D. component of training in healthcare policy and research for M.D.-Ph.D. students normally takes at least three years to complete. Courses taken during the M1 and M2 years of medical school satisfy a number of core course requirements, and additional elective courses are completed in the G1 year. M.D.-Ph.D. students, if eligible under NIH rules, are required to prepare and submit an NIH F30 predoctoral training grant application, which may be based on the dissertation proposal defended during the oral comprehensive examinations. Students also are encouraged to submit predoctoral training grant applications to other funding sources. Acceptance of a peer-reviewed first-author (or co-first-author) manuscript in a scientific journal indexed in PubMed or Web of Science that is based on experimental research conducted during Ph.D. training (rather than a review, commentary, case note or similar publication) is required of all M.D.-Ph.D. students prior to returning to the M3 phase of medical school.

Curriculum requirements for the M.D.

Based on the equivalent knowledge acquired by successfully completing MEDI 100, MEDI 150, MEDI 200 and MEDI 250, IBMS 651 and IBMS 652 during the M1 and M2 years, and IBMS 653, 16 credits are satisfied (nine credits of electives, HCPR 699 and EPID 571). Courses taken to satisfy Ph.D. requirements do not satisfy M.D. requirements.

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
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
Transition to Residency		

Curriculum requirements for the Ph.D.

Based on the equivalent knowledge acquired by successfully completing MEDI 100, MEDI 150, MEDI 200 and MEDI 250, IBMS 651 and 652 during the M1 and M2 years, and IBMS 653, 16 credits are satisfied (nine credits of electives, HCPR 699, and EPID 571). M.D.-Ph.D. students complete five credits of IBMS 697 (http://bulletin.vcu.edu/search/?P=IBMS%20697) in the summers after M1 and M2. Students are required to take additional credits of M.D.-Ph.D.-specific courses listed below.

Course	Title	Hours
Required core courses		
ECON 501	Introduction to Econometrics [1]	3
ECON 612	Econometrics	3
ECON 642	Panel and Nonlinear Methods in Econometrics [2]	3
EPID 571	Principles of Epidemiology (satisfied by M1-M2 study)	3
HCPR 699	Departmental Seminar (repeated four times; two credits satisfied by IBMS 653)	4
HCPR 701	Health Services Research and Policy I	3
HCPR 702	Health Services Research and Policy II	3
HCPR 703	Health Economics: Theory and Principles	3
HCPR 720	Social and Economic Determinants of Health Disparities	3
HCPR 730	Survey Research Methods and Analysis for Health Policy	3
HCPR 732	Research Design and Proposal Preparation	3
HCPR 733	Statistical Methods in Analysis of Healthcare Research	3
HCPR 734	Economic Evaluation and Decision Analysis in Health	3
Additional required courses		
IBMS 624	Research Reproducibility and Transparency	1
IBMS 651	M.D.-Ph.D. Journal Club (one-credit course, required fall and spring semester of M1; satisfies elective)	2
IBMS 652	M.D.-Ph.D. Science and Disease (satisfies elective)	1
IBMS 653	M.D.-Ph.D. Research Seminar (0.5 credit course, required fall and spring of M1, fall of M2, and during G phase except in semester of defense)	2
IBMS 697	M.D.-Ph.D. Directed Research (taken summers after M1 and M2)	5
OVPR 601	Scientific Integrity	1
or OVPR 602	Responsible Scientific Conduct	
or OVPR 603	Responsible Conduct of Research	
Electives		
Six credits satisfied by M1-M2 study; two credits by IBMS 651 and one credit by IBMS 652		9
Dissertation research		
HCPR 899	Directed Research	9
Total Hours		**59**

[1] BIOS 553 may be substituted with approval.

[2] BIOS 625, BIOS 631 or BIOS 647 may be substituted with approval.

The minimum number of graduate credit hours required for this degree is 59.

Plan of study timeline

The dual-degree program blends medical and graduate training supplemented with M.D.-Ph.D.-specific course work and opportunities during the medical (M) and graduate (G) phases of the curriculum that culminates in the simultaneous awarding of the M.D. and Ph.D. degrees. The timeline of medical and graduate training is as follows:

Year 1 (M1): Mostly preclinical medical course work, some research

- Preclinical medical courses
- M.D.-Ph.D. Journal Club (two semesters)
- M.D.-Ph.D. Seminar (two semesters)
- Research rotations (and pre-matriculation research opportunity)

Year 2 (M2): Mostly preclinical medical course work, some research and clinical rotation

- Preclinical medical courses
- M.D.-Ph.D. Science and Disease (one semester)
- M.D.-Ph.D. Seminar (one semester)
- Research rotations
- Preparation for USMLE Step 1
- Required M3 clinical rotation(s) (one or two, lasting six to eight weeks total)

Year 3 (G1): Graduate course work and research, some clinical experiences

- Graduate program course work
- M.D.-Ph.D. Seminar (two semesters)
- Directed research (begin dissertation research)
- Opportunities for clinical experience

Years 4-5 (G2-G3) and additional year if needed: Primarily research, some clinical experiences

- Ph.D. Qualifying Examination, admission to candidacy
- Submit NIH F30 fellowship application
- Directed research (completion of dissertation research)
- Graduate program course work
- M.D.-Ph.D. Seminar
- Required M3 ambulatory care rotation
- Publication of peer-reviewed first-author paper
- Dissertation defense

Years 6-7: M3-M4: Completion of clinical training, clinical research experience

- Clinical rotations
- Clinical and non-clinical elective
- Preparation for USMLE Step 2
- M4 Clinical research capstone project

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