Medical Education Program Highlights

The curriculum at Washington University School of Medicine (WUSM) is in transition. The legacy curriculum is traditional, with an emphasis on inquiry and flexibility. The MD-PhD program is one of the largest and most successful in the nation. Over 98% of students participate in research during medical school. About 50% spend a year or more in advanced study, often graduating with additional degrees including PhD, MSCI, MPH, MPH, and MBA. The Office of Medical Student Research and robust grant- and school-based funding support student research. Students have the ability to participate in a large variety of selectives, electives, student groups, and community-engaged experiences.

Planning for curriculum renewal, we committed to these strengths while incorporating best practices in evidence-based medical education. The new curriculum—called the Gateway Curriculum—begins in 2020–2021. It will:

• Be competency based and outcomes oriented
• Enhance horizontal and vertical integration of basic, clinical, social, and health systems sciences
• Ensure early and meaningful clinical exposure
• Incorporate evidence-based active learning methods
• Enhance community engagement and health systems science learning
• Expand opportunities and focused training in academic career development

Curriculum


Curriculum changes since 2010

The Gateway Curriculum intends to inspire learners to create the future of medicine, science, and society by supporting the development of physicians who are leaders in academic medicine including research, education, innovation, and advocacy. The curriculum consists of 3 phases over 4 years.

Phase 1 (Gateway to the Foundations) will last 16 months with 7 integrated modules, training students in the foundational basic, social, behavioral, and health systems sciences using a functions (physiological organization) and forms (anatomical organization) framework. Evidence-based active learning and technology will maximize student engagement and learning. Phase 1 will contain three 3-week clinical immersions where students rotate through inpatient, outpatient, and procedural settings. Students will practice clinical skills and develop professional identity while learning about health systems, all framed by patient and interprofessional provider perspectives. Students will also spend 4 weeks exploring academic careers in research, education, innovation, and/or advocacy.

Phase 2 (Gateway to Clinical Medicine) will last 12 months and consist of six 8-week clinical clerkships: internal medicine, surgery, pediatrics, obstetrics–gynecology, neurology, and psychiatry. Each clerkship will begin with foundational science, purposeful reiteration, and expansion of prior and new material (helical learning) taught in a signs and symptoms framework to facilitate knowledge transfer to clinical reasoning. Clerkships will end with 1 week for assessment, reflection, coaching, and communities. Students interested in research/scholarship can delay up to 16 weeks of Phase 2 to pursue this work.

Phase 3 (Gateway to Specialization) will last 20 months with schedules tailored to academic interests and career aspirations. Students will complete a 4-week internal medicine subinternship and three to four 4-week advanced clinical rotations. Phase 3 students will complete three 4-week Keystone Integrated Science courses exploring foundational and clinical science in important or emerging areas, including societal implications. A required 4-week capstone course (Gateway to Residency) will occur early in the graduation year focusing on competencies necessary to ensure readiness for internship. The remaining months are elective.

Coaches will support student learning and career development through all 4 years, teaching professional identity formation, reviewing longitudinal performance, and supporting individual student learning goals. Two additional longitudinal elements include students engaging in a Washington University or St. Louis community. Examples of these experiences include student government, research/scholarship, or longitudinal partnership with a St. Louis community organization. Finally, students will have the opportunity to pursue academic interests in research, education, advocacy, or innovation through all phases, including the ability to pursue dual degrees and other yearlong experiences if they desire (e.g., PhD, MSCI, MPH, MPH, MBA, MA bioengineering, education, health policy fellowship).

Assessment

See Table 1—Program Objectives and Assessment Methods.
### Table 1
**Program Objectives and Assessment Methods**

<table>
<thead>
<tr>
<th>Program objective</th>
<th>Assessment method</th>
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<tbody>
<tr>
<td><strong>Foundational knowledge of practice</strong></td>
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<tr>
<td>Demonstrate knowledge of normal human structure and function at the molecular, genetic, cellular, tissue, organ-system, and whole-body level in growth, development, and health maintenance.</td>
<td>MCQ&lt;br&gt;Short answer</td>
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<tr>
<td>Demonstrate knowledge of the basic mechanisms involved in the pathogenesis of common human diseases and their influence on clinical presentation and therapy.</td>
<td>MCQ/Shelf&lt;br&gt;Short answer&lt;br&gt;OSCE</td>
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<tr>
<td>Demonstrate knowledge of the epidemiology of common and clinically significant diseases.</td>
<td>MCQ/Shelf&lt;br&gt;Short answer&lt;br&gt;OSCE&lt;br&gt;Mini-CEX</td>
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<tr>
<td>Demonstrate basic knowledge of the impact of ethnicity, culture, socio-economic status, patient and provider biases, and other social factors on health and disease.</td>
<td>MCQ/Shelf&lt;br&gt;Short answer&lt;br&gt;OSCE&lt;br&gt;Reflections with feedback</td>
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<tr>
<td>Demonstrate basic knowledge of the ethical principles and professional values that underpin the medical profession.</td>
<td>Short answer&lt;br&gt;Reflections with feedback</td>
</tr>
<tr>
<td>Demonstrate basic knowledge of the common scientific methods used to study health and disease.</td>
<td>MCQ&lt;br&gt;Short answer&lt;br&gt;EBM rubric</td>
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<tr>
<td>Demonstrate basic knowledge of the methods and principles used for improving quality, safety, and costs of health care delivery for patients and populations.</td>
<td>MCQ&lt;br&gt;Short answer&lt;br&gt;Reflections with feedback</td>
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<tr>
<td><strong>Patient care</strong></td>
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<tr>
<td>Obtain appropriate medical histories that include psychosocial and behavioral factors that influence health.</td>
<td>Direct observation of clinical performance&lt;br&gt;OSCE&lt;br&gt;Mini-CEX</td>
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<tr>
<td>Perform accurate physical examinations.</td>
<td>Direct observation of clinical performance&lt;br&gt;OSCE&lt;br&gt;Mini-CEX</td>
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<tr>
<td>Discuss the indications, risks, and benefits of common medical procedures, demonstrate proficiency in performing the required procedures of the WUSM graduate.</td>
<td>Direct observation of clinical performance&lt;br&gt;OSCE/simulation&lt;br&gt;Mini-CEX</td>
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<tr>
<td>Formulate a prioritized differential diagnosis for the patient’s presenting symptoms, discuss expected physical examination findings based on the differential, and identify diagnostic testing required.</td>
<td>MCQ&lt;br&gt;Chart documentation&lt;br&gt;Direct observation of clinical performance (rubric/checklist)&lt;br&gt;OSCE&lt;br&gt;Mini-CEX</td>
</tr>
<tr>
<td>Interpret common physical examination, laboratory, and radiographic studies to inform the differential diagnosis and treatment plan.</td>
<td>MCQ&lt;br&gt;Short answer/chart documentation&lt;br&gt;Direct observation of clinical performance (rubric/checklist)&lt;br&gt;OSCE&lt;br&gt;Mini-CEX</td>
</tr>
<tr>
<td>Develop and carry out with supervision, appropriate, individualized diagnostic and treatment plans for patients across the broad spectrum of acute and chronic conditions.</td>
<td>Direct observation of clinical performance</td>
</tr>
<tr>
<td>Assess individual patient risk factors for common clinical conditions.</td>
<td>Direct observation of clinical performance&lt;br&gt;OSCE&lt;br&gt;Mini-CEX</td>
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<tr>
<td>Educate patients and families on strategies to reduce risk and promote health.</td>
<td>Direct observation of clinical performance&lt;br&gt;Multisource feedback&lt;br&gt;OSCE&lt;br&gt;Mini-CEX</td>
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### Table 1 (Continued)

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<td><strong>Interpersonal and communication skills</strong></td>
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<tr>
<td>Demonstrate respectful and effective verbal and nonverbal interpersonal and communication skills with patients, families, colleagues, and all members of the health care team.</td>
<td>Multisource feedback Direct observation of clinical performance OSCE</td>
</tr>
<tr>
<td>Discuss diagnostic and treatment options in a manner that will facilitate the participation of patients and their families in shared decision-making.</td>
<td>Multisource feedback Direct observation of clinical performance OSCE</td>
</tr>
<tr>
<td>Maintain accurate and thorough medical records.</td>
<td>Multisource feedback Direct observation of clinical performance</td>
</tr>
<tr>
<td><strong>Professionalism</strong></td>
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<tr>
<td>Maintain a professionally appropriate demeanor.</td>
<td>Multisource feedback Direct observation of clinical performance OSCE Mini-CEX Reflection</td>
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<tr>
<td>Exhibit high standards of professional integrity.</td>
<td>Multisource feedback Direct observation of clinical performance Reflection</td>
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<tr>
<td>Demonstrate an awareness of potential conflicts of interest.</td>
<td>Reflection</td>
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<tr>
<td>Apply legal and ethical principles governing the physician–patient relationship.</td>
<td>Multisource feedback Direct observation of clinical performance Short answer Reflection</td>
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<tr>
<td>Act in the patient's best interest and serve as a patient advocate.</td>
<td>Multisource feedback Direct observation of clinical performance Reflection</td>
</tr>
<tr>
<td>Recognize, monitor, and address psychological and physical factors in oneself that may affect professional performance.</td>
<td>Reflection</td>
</tr>
<tr>
<td><strong>Systems-based practice</strong></td>
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<td>Work collaborative and effectively in interprofessional teams.</td>
<td>Multisource feedback Direct observation of clinical performance OSCE/simulation Reflection</td>
</tr>
<tr>
<td>Recognize the roles of various members of the interprofessional health care team and the scope of their practice.</td>
<td>MCQ Direct observation of clinical performance Multisource feedback OSCE/simulation Reflection</td>
</tr>
<tr>
<td>Demonstrate the ability and willingness to adapt to various health care delivery settings (e.g., inpatient, ambulatory, OR, labor and delivery, ED).</td>
<td>MCQ Direct observation of clinical performance</td>
</tr>
<tr>
<td>Recognize barriers to and facilitators of safe, high-quality patient care.</td>
<td>MCQ Short answer Direct observation of clinical performance (rubric/checklist) OSCE/simulation Reflection</td>
</tr>
<tr>
<td>Describe individual, team, and system challenges that may contribute to medical errors; demonstrate the ability to identify medical errors when they occur.</td>
<td>MCQ Short answer Reflection</td>
</tr>
<tr>
<td><strong>Practice-based learning and improvement</strong></td>
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<tr>
<td>Demonstrate the skills needed for lifelong learning including the ability to identify and address personal strengths and weaknesses, to incorporate formative feedback, and to self-assess knowledge and performance to develop a self-improvement plan.</td>
<td>Reflection Multisource feedback</td>
</tr>
<tr>
<td>Apply an evidence-based approach to selecting, appraising, and using evidence from scientific studies related to clinical questions and patients’ health problems.</td>
<td>MCQ EBM rubric</td>
</tr>
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</table>
Assessment framework: We created our current program objectives based on the ACGME competencies, adapted through a local Delphi process. The Delphi process (open to all faculty engaged in the current curriculum, program directors from all residency and fellowship programs at Washington University/Barnes-Jewish Hospital/St. Louis Children’s Hospital, and all department chairs or their designees) set measurable, required graduation competencies.

Assessment changes since 2010
In 2010, we incorporated self assessments and peer assessments and narrative feedback of professional behaviors in the preclerkship courses. Within the Gateway Curriculum, we will implement a variety of assessments. These assessments will appear in dashboards and portfolios for review by learners and coaches.

Parallel curriculum or tracks
Not applicable.

Pedagogy
Pedagogical approaches:

• Case-based learning
• Clinical experience: ambulatory
• Clinical experience: inpatient
• Discussion: large group (>12)
• Discussion: small group (≤12)
• Games
• Laboratory
• Lecture
• Mentorship
• Patient presentation
• Peer teaching
• Preceptorship
• Reflection
• Self-directed learning/tutorial
• Service-learning activity
• Simulation
• Standardized/simulated patients
• Team-based learning
• Video/podcast

Changes in pedagogy since 2010
We emphasize instructional activities requiring students to work in teams, applying concepts, and problem-solving. We did not adopt a single pedagogy, instead relying on a variety of approaches applicable to a given learning activity, supported by technology such as videos, e-learning resources, and audience response systems.

Clinical experiences
Required clinical experiences occur in inpatient, acute care, and outpatient clinics; operating rooms; and labor and delivery facilities.

Required longitudinal experiences
None.

Clinical experience first encounter
Students encounter clinical experiences during the first year as part of the Practice of Medicine curriculum. Beginning in 2020, students will participate in 3 immersion blocks in Phase 1.

Required and elective community-based rotations
There are no required community-based rotations. Students have multiple options for core rotations and electives including the VA, outpatient clinics, community-based clinics, and hospitals. All students work with patients from underserved backgrounds through federally qualified health centers, Barnes-Jewish Hospital, and St. Louis Children’s Hospital.

Challenges in designing and implementing clinical experiences for medical students
Identifying interested, qualified preceptors is a challenge, although retention has been high. Recently, we created new partnerships with 2 federally qualified health centers in the St. Louis region. We also expanded our engagement with Barnes-Jewish Hospitals to meet this need.

Curricular Governance
The curriculum is overseen by the Committee on Medical Student Education (COMSE). COMSE includes representatives from the education leadership team, department chairs, course directors, at large faculty, and students. COMSE’s charge includes oversight of curricular content including program and course objectives, content integration, policies and procedures, program evaluation, and continuous quality improvement. COMSE also ensures ongoing compliance with the standards and elements of the LCME. COMSE charges subcommittees, task forces, and work groups for particular purposes such as policy development, curricular subcommittees, focused curricular reviews, specific LCME standards/elements, and the learning environment. COMSE is a subcommittee of the Academic Affairs Committee (AAC), which is the academic subcommittee of the Executive Faculty (EF), the governing body of the school of medicine. COMSE refers matters of broader policy to the AAC and EF.

Decentralized curricular governance
Course directors and other administrative leaders receive appointments via a cooperative process between the Office of Education (OE) and the departments. Compensation for course directors is shared between the OE and the departments. Operational budgets and administrative support for nonclerkship courses reside in OE. The departments provide operating costs and administrative support for clinical clerkships.

Education Staff
Currently funded support includes:

• Office of Medical Student Education (15 FTE): OMSE provides oversight of the curriculum for the MD program, including schedule management, evaluations, assessments, course planning, and material support for all course directors.
• Core teaching faculty (16.9 FTE): We protect and support time for about 50 faculty teaching and administrative roles. This $4.2 million effort ($2.6 million in education support, $1.6 million to departments) allocates 13 FTE across our curriculum. For the Gateway Curriculum, we will increase to over 85 faculty members with supplemental protected time reaching 16.9 FTE paid through a mix of medical education and department funding.
• Coaching and assessment programs (9.4 FTE): Launching in 2020, our coaching program (7.3 FTE) will train students in professional identity formation, communication, and professional development. A competency committee (2.1 FTE) will review and adjudicate learner progress.
• Educational technology and innovation (4 FTE): This unit collaborates with students, faculty, and staff to support and enhance educational technology integration.
• Instructional design studio (2 FTE): This unit adds internal capacity and a dedicated studio for creation and design of educational materials. Using state-of-the-art technology, the instructional designer and videographer collaborate with faculty on content development, video production, and screencast recording.
• Program evaluation and continuous quality improvement (3.5 FTE): This unit oversees the evaluation of the MD program, synthesizing and presenting data that drives change that aligns with accreditation requirements and institutional strategic planning.
• Medical student research and scholarship (3.4 FTE): This unit supports the design and implementation of the academic career development curriculum and the scholarly work of medical students including alignment with mentors, stipends, and dissemination.
• Immersive learning centers (3.5 FTE): These centers include the standardized patient and high-fidelity simulation centers, which provide comprehensive simulation-based training and assessment for medical students.
• Medical education research unit (2.5 FTE): This unit supports the development and dissemination of education scholarship.
• Academy of Educators (1.7 FTE): The academy provides faculty development, small grants, an awards program, advocacy, and a learning community for educators.
• Center for Interprofessional Practice and Education (CIPE, 2 FTE): CIPE provides coordination and support for interprofessional education and serves as the home for the collaboration between WUSM, Goldfarb School of Nursing, and St. Louis College of Pharmacy.
• Career counseling (2 FTE): This unit provides career, match counseling, and support including creation of the MSPE.

Medical education leadership
See Figure 1—Organizational chart.

Department of Medical Education
The primary medical education staff and administrative faculty in the undergraduate medical education (UME) educational
Faculty Development and Support in Education

Professional development for faculty as educators
The Office of Faculty Affairs and the Academy of Educators host regular workshops for faculty aimed at learning new skills and honing existing ones as academicians and educators.

Role of teaching in promotion and tenure
Teaching and/or educational contributions are expected and are considered significant components of the promotion dossier for faculty members in the investigator or clinician tracks. Faculty in clinician tracks must submit a clinician–educator portfolio for promotion to the associate and professor ranks.

Teaching academy
The Academy of Educators:
• Fosters an environment where education is highly valued and conducted at the highest level
• Encourages and recognizes innovative approaches to teaching, learning, and assessment

• Provides advocacy for education in the promotion process
• Organizes mentorship and faculty development programs in medical education
• Supports exceptional educational research and scholarship in the health sciences

Programming includes:
• Faculty development certificate programs in teaching skills, learner assessment, curriculum development, program evaluation, and educational scholarship
• Workshops on teaching, mentoring, and other elements of education and leadership
• Faculty recognition through the Teaching Awards Program that includes competitive 2-year fellowships to fund time to work on innovative teaching projects and curricular development
• Education research and innovation support through a small-grants program

Regional Medical Campuses
Not applicable.

Initiatives in Progress
Our curriculum is undergoing a comprehensive renewal set to launch in fall 2020. Setting the stage for curriculum renewal has included reorganization of the management structure as well as new units and staff, all aimed at ensuring support for and central oversight of the curriculum.

Missouri program (OMSE) are responsible for course content and all relevant material support needed to execute the curriculum for UME. There are separate offices with administrative and faculty support for admissions, student affairs, pre-UME, graduate medical education, and continuing professional development, all of which fall under the Office of Education, run by the senior associate dean for education.