University of Missouri–Columbia School of Medicine
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Medical Education Program Highlights

Patient-based learning curriculum

The University of Missouri (MU) School of Medicine implemented a hybrid problem-based learning (PBL) curriculum in 1993, which we renamed “patient-based learning.” Almost 30 years later, our school is noted for USMLE Step 1 and 2 examination scores consistently above the national means, 96%–99% residency match rates, and positive responses to a survey of program directors who supervise our recent graduates (interns).

In 2019, a study summarized variables associated with USMLE scores and identified institutions’ curricula that deviated from trend lines by producing higher USMLE scores despite having lower entrance grade point averages and MCAT scores.1 Several medical schools outperform or underperform trend line expectations for USMLE, irrespective of entering student qualifications. The University of Missouri School of Medicine was found to significantly outperform in both Step 1 and 2, which may be explained by curriculum and administrative differences. We acknowledge the core faculty dedicated to our PBL model and the many students who choose MU, in part, because of the curriculum.

Integrated simulation activities

• Simulation activities throughout the 4-year curriculum
• Integrated simulated participant cases and the technological delivery of patient findings added a more realistic dimension to PBL cases
• Established a robust Step 2 Clinical Skills exam preparation and remediation course
• Implemented a fourth-year simulation elective prep-for-residency skills course

The MU Rural Track Pipeline Program

• Has academic–community partnerships with 9 health systems throughout Missouri.
• Provides students with sequential, ongoing exposure to rural medicine over the course of 4 years. Programs include the Lester R. Bryant Scholars Pre-Admissions Program, the Rural Scholars Program, the Rural Track Summer Community Program, the Rural Track Clerkship Program, and the Rural Track Elective Program.2,3

Diversity and inclusion initiatives

• Expanded pipeline programs to include the “Called to Academic and Leadership Excellence and Building Character and Confidence” science club, which allows us to attract students as young as fifth grade
• Added inclusion symposiums to applicants’ interview day, which improved view of diversity and inclusion
• Added diversity and inclusion primer to prematriculation Med Prep 3 program
• Increased numbers of underrepresented minority matriculants from 4% in 2016 to 17% in 2019
• Work with students in implementing diversity and inclusion programs throughout the school year (Diversity Dialogues) with discussions on microaggressions, implicit bias, and inclusion
• Support and encourage faculty and staff to participate in a daylong diversity and inclusion training, Building Inclusive Clinics and Classrooms

Curriculum

Curriculum description

• Years 1 and 2 focus on basic science education and early clinical experiences; year 3 focuses on core clerkship experiences; and year 4 offers specialty-specific general electives, advanced clinical electives (e.g., subinternship), and advanced basic science experiences (e.g., facilitating, tutoring, writing, and research).
• Years 1 and 2 are structured in 10-week blocks (8 weeks of content, 1 week of examinations, and 1 week off). Each week includes approximately 10 hours of lecture, 10–12 hours of small-group activities, and time for independent learning. Early outpatient clinical experiences start in the first year. The clerkship phase consists of 7 core clerkships. The elective phase consists of 30 weeks of elective courses. The Contemplating Medicine, Patients, Self, and Society (COMPASS) course runs longitudinally across all 4 years.


Curriculum changes since 2010

• The Next Level of Excellence initiative identified 3 gaps in medical students’ educational experience: culturally effective care, population and public health, and professional identity formation. We implemented several strategies to address these gaps. Our key characteristics and overall education goals were updated to include these content areas.
• We implemented COMPASS, a 4-year longitudinal course to enhance students’ learning about topics related to professional formation such as transitions, physician roles and vision, stress...
and coping strategies, the impact of culture on health care delivery, and professional/personal choices and boundaries. Learning strategies include group discussion, reflective writing, storytelling, reading, and case problem solving.

- We formed the Incorporating Wellness into the Curriculum Committee, comprising medical students, staff, faculty, and associate deans, to integrate strategies that reduce student burnout and increase resilience.
- The neurology clerkship increased from 2 weeks to 4 weeks in length.
- The Springfield Clinical Campus (SCC) opened in 2016 as part of our class expansion to educate third- and fourth-year medical students.
- We added more active learning strategies including the flipped classroom.
- Block 8 content (at the end of year 2) was shortened to 5 weeks, and more independent study time for USMLE Step 1 exam preparation was added during the block.

Class size changes since 2010

- We increased our class size to 128 students in AY 2017–2018 and constructed a new medical school building (the Patient-Centered Care Learning Center), which includes a high-tech, flat-style classroom, a high-fidelity simulation center, 32 PBL small-group meeting rooms, and an anatomy lab for student learning.
- Up to 64 third- and fourth-year medical students per year complete their clerkship and elective phases at the SCC.

Assessment


Assessment changes since 2010

- Implemented a new computer-based testing platform for exams during the preclerkship phase
- Changed the clinical reasoning exam (CRE) format to reflect a developmental approach of assessing clinical reasoning; changed the CRE grading criteria to satisfactory, marginal, and unsatisfactory and made it a closed resource exam.
- Developed a centralized system to track students’ completion of required direct observations of the history and physical exams during their clerkship.
- Updated the monitoring process to ensure students receive midblock feedback during every clerkship.
- Changed our end-of-clerkship faculty evaluation of students’ clinical performance from a 9-point scale to a 3-point scale (exemplary, meets expectations, and needs improvement).
- Added a COMPASS capstone assignment during the fourth year to assess students’ ability to apply the knowledge and skills learned in COMPASS to a self-described health care encounter where their values were challenged.

Pedagogy

See Table 1—Pedagogical Approaches.

Changes in pedagogy since 2010

- Implemented the longitudinal, blended, small-group learning experience (COMPASS course), which includes students from each of the 4 classes and 2 faculty guides to address topics related to professional formation.
- Incorporated more active learning sessions in lieu of live lectures.
- Added a service learning component to IPC in blocks 3 and 4.
- Reorganized anatomy content to align with PBL and IPC block content with more focus on the clinical correlation and application.

Clinical experiences

- The main campus primarily uses the University of Missouri Health Care facilities and the Harry S. Truman Memorial Veterans Hospital for outpatient and inpatient clinical training.
- The Springfield regional campus uses CoxHealth System and Mercy Health System facilities for clinical training. Students may also rotate at the local federally qualified health center and the Federal Bureau of Prisons facility.
- The MU Rural Track Pipeline Program has 9 academic–community partnerships with hospitals in Missouri, where approximately 25% of students complete up to 3.5 core clerkships in a rural community.
- The family medicine clerkship uses several community-based practices across Missouri.

Required longitudinal experiences

The MU AHEC Rural Track Pipeline Program received a grant to develop a longitudinal integrated clerkship at a rural track training site set to begin in June 2021.

Clinical experience first encounter

- Students are assigned to work with 1 primary care and 1 specialty care preceptor as part of the ACE experience during their first year (required).
- Students may participate in additional clinical experiences during the summer after their first year and during their second year.

Required and elective community-based rotations

Students have opportunities to train in a variety of community-based clinical settings, including:

- VA hospital
- Rural and primary care community-based clinics throughout Missouri
- Federal Bureau of Prisons
- Federally qualified health centers
- Psychiatry community-based clinics

Challenges in designing and implementing clinical experiences for medical students

- Recruiting and adequately training community-based faculty to maintain our clinical rotation capacity.
Shrinking training opportunities due to significant increases in placement requests for health professions students
Physician burnout attributed to higher productivity expectations by their health system

Curricular Governance
The Curriculum Board is charged with primary policy-making authority for medical student academic programs. Subcommittees of the Curriculum Board include the Preclerkship Steering Committee, which oversees the years 1–2 curriculum, and the Clinical Curriculum Steering Committee, which oversees the years 3–4 curriculum.
The Curriculum Board membership includes 15 elected members (10 voting faculty and 5 nonvoting students) with representation from both the main campus and the SCC. The Curriculum Board meets monthly and the dean and associate deans attend as ex officio members.

Decentralized curricular governance
The simulation center is administratively under the Medical Education Office and the director reports to the senior associate dean. The possibility of the simulation center becoming an independent self-sustaining resource is under study.
The SCC budget has been separate during its first 5 years of operation, but folding this budget into the overall school of medicine budget for education is being contemplated.

Education Staff
The Medical Education Office provides support and resources to the Curriculum Board and its subcommittees to fulfill their charge of curriculum oversight, as well as to faculty in their teaching roles.
We have a team of dedicated and talented student program coordinators and instructional design specialists with expertise to support our mission: “to educate physicians to provide
effective patient-centered care for the people of Missouri and beyond.”

- We have a business technology analyst and a team of programmers who provide support and maintenance of data systems used to support curriculum delivery, monitoring, and management.
- The Medical Education Office provides support to faculty and students for all aspects of medical education, including pipeline programs, preadmission programs, medical school admissions, basic science and clinical curriculum, faculty development, student assessment, rural health experiences, student support, advising, residency match assistance, and graduation.

See Figure 1—Organizational chart.

**Faculty Development and Support in Education**

**Professional development for faculty as educators**

We support professional development of our faculty educators in several ways:

- Annual Education Day includes guest speakers on medical education topics, a teaching awards ceremony, and poster presentations highlighting curricular innovations.
- Local activities and workshops are hosted by faculty leaders and the Medical Education Office.
- Support is provided to participate in national conferences and faculty development programs.
- A mentoring program has been established.
- We are updating our faculty development resource center, including online modules and articles highlighting our curriculum and best teaching practices, which will be available to all onsite and offsite teaching faculty.

**Role of teaching in promotion and tenure**

Faculty can demonstrate excellence in teaching criteria for promotion by presenting evidence of exemplary teaching evaluations by learners, teaching awards, and scholarship such as presentations and publications.

**Regional Medical Campuses**

See Table 2—Clinical Regional Campus.

**Educational experiences across sites**

- Clerkship leadership and medical school administration track and monitor required patient experiences through our centralized patient log system.
- SCC and main campus clerkship faculty directors and administrative leadership participate in an annual retreat to review annual reports and data and to discuss innovations and challenges.
- The same course learning objectives and assessment methods are used across all learning sites.
- We compare grade distribution and student ratings on end-of-block evaluations across all learning sites.
- Clerkship directors orient all new faculty to learning objectives and evaluation tools.

**Table 2**

**Clinical Regional Campus**

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<thead>
<tr>
<th>Regional campus name</th>
<th>Type</th>
<th>Enrollment number</th>
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<tbody>
<tr>
<td>Springfield Clinical Campus (SCC)</td>
<td>Clinical</td>
<td>Up to 64 third- and fourth-year students per year</td>
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References


