University of Michigan Medical School
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Medical Education Program Highlights
The University of Michigan Medical School (UMMS) was founded in 1850. For much of its existence, the curriculum followed a traditional Flexnerian model. Over time, the preclinical curriculum shortened, and the clinical curriculum lengthened. In 2016, the curricular structure inverted. A 17 + 12 + 12-month model transitioned to a 12 + 12 + 17-month model to provide a robust integrated foundation with early clinical immersion, followed by an expanded postclerkship phase for impact-focused work and deliberate professional and leadership development. The new curriculum consists of a “trunk” and “branches,” in honor of the oak trees for which Ann Arbor is named.

See List 1—Program Highlights.

Curriculum

Curriculum description
The preclinical phase, the scientific trunk, consists of 12 months of foundational learning focused on basic and health system sciences. The core clinical phase, the clinical trunk, consists of the 1-month Transition to Clerkships course and 12 months of departmentally based clinical clerkships. The advanced phase, the professional development branches, is 17 months of required and elective activities. Longitudinal courses are integrated across all 3 phases.


Scientific trunk
The scientific trunk comprises 6 integrated blocks. Normal functioning is taught concurrently with pathophysiology in a single-pass curriculum. Disciplines (e.g., anatomy, pathology, pharmacology) are threaded throughout all or portions of the year. Basic science content is longitudinally integrated with other courses (e.g., as students learn about the cardiovascular system, they simultaneously learn to perform a cardiac history and physical exam in the Doctoring program). In the scientific trunk, instruction occurs through a combination of lectures (~50%), small groups (~30%), labs, standardized patient (SP) interactions, patient presentations, tutorials, and online modules (~20% combined).

Clinical trunk
Transition to Clerkships prepares learners to think deeply about basic science connected to clinical care through case-based learning and multiple SP assessments. The clerkships include internal medicine, pediatrics, obstetrics–gynecology, family medicine, psychiatry, neurology, and surgery and applied sciences. Learning on clerkships primarily occurs through immersion on inpatient and outpatient care teams. Clerkship didactics supplement clinical learning using a variety of pedagogies (e.g., flipped classroom, simulation, lecture, case-based learning). Three specific initiatives emphasize foundational science in the clinical phase: applied sciences—a 4-week rotation during surgery comprising anatomy, radiology, pathology, and pathophysiology; Science and Practice of Medicine—a longitudinal, case-based learning course on core and cutting-edge science topics; and Health Systems Science—a 1-week course on health disparities, ethics, quality improvement (QI), patient safety (PS), and value-based care.

Professional development branches
The branches constitute the third and final phase of the UMMS curriculum. Students select 1 of 4 branches:

- Patients and populations (primary care, population health, patient-centered medical homes, longitudinal clinic experience)
- Systems- and hospital-based care (hospitalized patients, health systems, QI, PS, value-based care)
- Procedure-based care (patients requiring diagnostic and therapeutic procedures, technical and nontechnical skills)
- Diagnostics and therapeutics (technologies to diagnose and treat disease; disease-based electives)

The branches aim to ensure clinical excellence, so learners are “ready day one” for residency, while providing flexible, individualized professional development pathways to launch students on impact-focused careers. Students can pursue any elective or residency from any branch. A branch advisor helps learners align their schedule with professional goals. Students use abundant elective time to engage in research or other scholarly pursuits. Branches culminate in specialty-specific residency preparatory courses containing high-yield topics for incoming interns, using a number of pedagogies.

Longitudinal elements
Doctoring is a 4-year longitudinal clinical skills and coaching program. Small groups are cotaued by 2 physician faculty. One serves as the primary instructor/assessor and the other serves as a coach, helping learners reflect on competency development, work–life integration, professional identity formation, and well-being. Chief Concern is a 1-year longitudinal clinical reasoning course teaching students how to think through clinical problems.
and mentors. Examples of capstones include research on sustained self-directed learning with guidance from advisors aimed at creating new knowledge and/or delivering a solution.

The Capstone for Impact is a longitudinal experiential project in which ~80% of the student body participates. Students choose from ethics, global health and disparities, health policy, innovations and entrepreneurship, medical humanities, PS/QI/complex systems, scholarship of learning and teaching, or innovation and entrepreneurship, medical humanities, PS/QI/complex systems, scholarship of learning and teaching, or scientific discovery. Learners engage in small-group didactic sessions to deepen knowledge and build community and receive 1:1 mentorship on a capstone.

The Capstone for Impact is a longitudinal experiential project aimed at creating new knowledge and/or delivering a solution, improvement, or innovation to a real-world issue, requiring sustained self-directed learning with guidance from advisors and mentors. Examples of capstones include research on postcholecystectomy opiate prescribing practices, a podcast on the Detroit water shortage, and invention and marketing of a “neovent” (an affordable neonatal bubble continuous positive airway pressure device for resource-poor settings).

Curriculum changes since 2010

Triggered by a charge from the dean to better prepare learners as leaders and change agents of the future, in 2015, the faculty voted for a sweeping curricular transformation made up of 8 elements: scientific trunk, clinical trunk, branches, Paths of Excellence Program, Leadership Development Program, IPE, M-Home learning community, and competency-based assessment. The first 6 elements have been described above.

The M-Home emphasizes connections, community, personal authenticity, and meaning and purpose to enhance well-being and work–life integration. The M-Home is organized into 4 houses, serving as the anchor for Doctoring small groups, where personal and professional support is provided by a network of peers, counselors, faculty, and directors.

The approach to assessment transitioned from a higher-stakes, course/clerkship-based model, with a heavy emphasis on medical knowledge, toward a competency-based model, with frequent lower-stakes assessments across multiple competency domains. While students still have graded courses on their academic transcript (exclusively pass/fail in the preclinical phase, mostly honors/high pass/pass/fail in the clinical phase), overall progression through the curriculum is assessed through the lens of competency development.

Assessment

The medical school identified and reviewed competencies from multiple sources (e.g., ACGME objectives, the Physician Competency Reference Set) and constructed 8 UMMS competency domains, 6 aligned with ACGME objectives. Leadership, teamwork and interprofessionalism, and critical thinking and discovery were added to complete the vision of the new UMMS graduate.


Organizational and structural changes were implemented to support the shift toward competency-based medical education (CBME). A robust electronic learning outcomes dashboard was developed to capture multisource competency assessment data and present them visually, facilitating review and decision making. Data include quantitative measures, Likert-scale assessments of competency development, and narrative descriptions. Competency development is monitored by Competency Committees, with broad representation from faculty, allied health professionals, patient advocates, and student services. These committees follow matriculating cohorts longitudinally and holistically review all students multiple times to ensure appropriate development in all competency domains, and identify support for students. Students have full access to their data, and periodically perform self-assessments, guided by coaches. Identified competency assessment gaps are progressively
being filled with novel assessments. For example, assessment of
the capstone projects focus on harder-to-assess domains such as
practice-based learning and improvement, leadership, teamwork
and interprofessionalism, and critical thinking and discovery.

Traditional assessments have been reorganized to support
learning. Students now take the USMLE Step 1 examination
after the clerkships, to foster deep learning of the scientific
underpinnings of clinical medicine. Multiple SP-based
assessments have been dispersed across the first 2 years to
provide frequent, low-stakes assessment and feedback. A
postclerkship multistation clinical assessment guides students’
branches work and preparation for USMLE Step 2 Clinical Skills.

We are exploring competency-based, time-independent
progression through the postclerkship phase, which may
facilitate time-variable completion of the MD degree in the
future.

**Pedagogy**

Overall, we decreased lectures and labs and increased active learning,
case-based learning, online modules, simulation, and SP encounters.

Several courses are made up almost entirely of active learning (e.g.,
Doctoring, Chief Concern, the Leadership Development Program,
IPE, Transition to Clerkships, Science and Practice of Medicine).

**Clinical experiences**

Students are first exposed to patients in fall of year 1 as part of
IPE. Learners are fully immersed in clinical care by September
year 2. The majority (~85%) of core clinical experiences occur at
Michigan Medicine hospitals. Students also rotate at 2 large urban
health care centers, 2 neighboring community hospitals, and the
Veterans Administration. The balance of inpatient and ambulatory
experiences is roughly 65:35. A 12-month longitudinal clinic is
required in the patients and populations branch where students
work with the same preceptor, often encountering the same patients.

**Curricular Governance**

Curricular governance is overseen centrally by the Curriculum
Policy Committee (CPC) and its 5 curricular subcommittees.
Competency Committees (CCs) assess competency development
and monitor academic progress. CPC and CCs report directly to
the Executive Committee (EC). Elected student representatives

![Curricular governance structure](image-url)

* Denotes student involvement
* Even / odd refer to matriculating student year

**Figure 1** Curricular governance structure.
Figure 2 Academic affairs organizational chart.
serve on all committees, except for the EC, reflecting a core value of partnering with learners.

See Figure 1—Curricular governance structure.

**Education Staff**

**Medical education leadership**

The Office of Medical Student Education (OMSE) plans, implements, evaluates, and oversees all aspects of the medical student program. The associate dean and senior director for medical student education oversee 4 central units and the M-Home, each collaboratively led by faculty (assistant dean or director) and a staff director. The OMSE sits within Medical School Administration, led by the executive vice president for medical affairs/dean.

See Figure 2—Academic affairs organizational chart.

Curricular leadership and faculty with significant teaching roles are supported by direct salary offsets from the OMSE. Smaller teaching roles are compensated via educational value unit-mediated funds flow to departments.

In addition to the OMSE, UMMS has the Department of Learning Health Sciences (DLHS), a first-in-the-nation basic science department focused on the sciences related to learning. DLHS is organized around 4 collaboratives (education, simulation, infrastructure, and implementation) to support academic and research efforts. Key offerings include the Medical Education Scholars Program (that introduces faculty to educational design and scholarship) and a competency-based Master of Health Professions Education.

**Faculty Development and Support in Education**

The Office of Faculty Development offers more than 100 unique courses annually to meet the continuing education needs of faculty. Leadership programming and coaching are notable strengths.

Two communities of practice support health sciences education. The first is the Academy for Educational Excellence and Scholarship. With over 400 members, the Academy helps augment the educational rigor and innovation of its faculty by bringing the community together to discuss important topics and engage in peer development and mentoring. The second is RISE (Research. Innovation. Scholarship. Education.), which aims to develop and implement innovative and potentially transformative education ideas. Members receive personal innovation coaching, including instruction on change management.

Faculty educational efforts are recognized in promotion and tenure decisions. The promotion criteria for the clinical track were recently revised, and a clinician–educator pathway was delineated. The definition of scholarship was expanded beyond peer-reviewed manuscripts to include book chapters, innovative teaching practices, educational modules, curriculum development, and patient and community education, among others.

**Initiatives in Progress**

As a public institution, UMMS is committed to both innovation and continuous QI to improve the health of patients and society. Three initiatives in progress will continue to guide our work:

- Fully actualizing the CBME vision, by expanding assessments of all 8 competencies and leveraging big data to make judgments. Time variability and effective educational handovers to residency programs are future goals.
- Enhancing well-being and improving the learning environment by adopting system-wide cultural transformation strategies toward kinder, civil, and health-supporting values.
- Growing communities of practice in health sciences education (e.g., RISE) that emphasize both bold innovation and responsible change management, to tackle the big issues facing medical education, and the needs of society.