The University of Kansas School of Medicine

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Medical Education Program Highlights

Following 3 years of development, we launched a comprehensively revised curriculum in 2017. We designed the revision process to involve all stakeholders in planning, development, and implementation. Using a “ground-up” evidence-based approach, we developed content, delivery methods, and assessment strategies de novo. The Active-learning, Competency-based, Excellence-driven (ACE) curriculum features:

- Learning communities providing a professional and educational home for every student
- Pervasive, longitudinal clinical engagement, including clinical enrichment weeks ending preclerkship courses
- Diverse active learning strategies promoting cognitive integration of clinical and foundational sciences
- Preclerkship curriculum “bookended” by courses enhancing clinical communication, patient assessment, and clinical reasoning
- Extensive formative assessment coordinated with frequent summative assessments and in-line remediation
- Individual “dashboards” enabling students and faculty to track progress
- Standardized objective measures to assess mastery of clerkship competencies

The educational program is implemented on 3 campuses that share the single vision, mission, and identity of the school of medicine.

Important initial ACE outcomes include:

- Improved student preparation for patient care
- Increased faculty–student interactions and enhanced, close professional relationships initiated early in training
- Enriched faculty collegiality and communication across disciplines and specialties
- Improved longitudinal learner support, including individual coaching and continuity “learner hand-offs” across course/clerkship transitions
- Improved equity of assessment across campuses
- Enhanced competency-based assessment and expansion of narrative input
- Emphasis on attainment of Entrustable Professional Activities (EPAs) related to graduation competencies
- Development of a cohort of educators prepared in ACE principles and strategies, including coaching and advising

Encouraged by positive monitoring data and initial internal and external measures of success, we continue to improve the ACE curriculum, maintaining focus on evidence-based innovation, quality enhancement, and involvement of stakeholders. These efforts will ensure our 114-year tradition of excellence in graduating outstanding physicians committed to patients and the public health, support of colleagues, and maintenance of professional vitality and resilience.

Curriculum

Curriculum description

Courses (blocks) in the first 2 years are organized around organ systems, “bookended” by clinically intensive initial and final blocks. Year 3 clerkships are aligned with the major medical specialties. The fourth year enables students to individualize experiences within required rotations in critical care, rural preceptorship, subinternship, and electives.

The learning activities of the preclerkship blocks are predominantly case based and focused on problem-solving that integrates diverse scientific and clinical concepts. The blocks incorporate extensive simulation activities to further promote integration and application of didactic material. The culture of the ACE curriculum is centered on patient care. The initial block, Introduction to Doctoring, equips students with interviewing and assessment skills necessary to complete an appropriate medical history and physical examination. This enables our doctors-in-training to participate in health care teams during the enrichment weeks of each block. Students select from a range of enrichment activities, available in diverse medical specialties and clinical environments.


Curriculum changes since 2010

In contrast to previous incremental change with periodic disruptive major revisions, curricular development is now a continuous quality enhancement process using continuous systematic assessment, improvement, and innovation. The ACE curriculum is a learner-centered, patient-focused program integrating foundational and clinical sciences with the goal of appropriate professional identify formation. We intend our students to identify and act as physicians-in-training (with all associated responsibilities) from day 1. The most significant changes since 2010 include:

- Individual coaching
- Multiple avenues for real-time feedback
- Systematic tracking of mastery of content and achievement of objectives
• Learning activities prioritizing patient care and enhancing cognitive integration
• Increased interprofessional and small-group experiences
• Expanded human and manikin simulation experiences
• Core EPA framework for the clinical skills curriculum; mapping of EPAs to graduation competencies

Class size changes since 2010
The entering class has remained at 211 students since 2011. The Kansas City campus matriculates 175 learners, of whom 48 transfer to the Wichita campus for clerkships. The Salina campus, established in 2011, focuses on preparing graduates for rural practice. With 8 students per class, Salina is the nation’s smallest 4-year medical education site. The community-based Wichita campus, established in 1971, expanded to a 4-year program with 28 students in each entering class in 2011. Wichita graduates 76 students per year and continues to lead the nation in the number of graduates entering family medicine.

Assessment
Our 35 graduation competencies are based on the AAMC’s Physician Competencies Reference Set and the Core EPA frameworks. These graduation competencies provide the framework for objectives in individual courses and clerkships.


A core feature of ACE is robust formative assessment to support learning plus frequent summative assessment to track progress toward competency acquisition. Specific assessments were developed for each objective and competency.

Assessment in the preclerkship phase features:
• Formative assessment as a core educational tool for recall-assisted learning and framing of content
• Summative assessment through biweekly multiple-choice examinations and end-of-block clinical skills assessment; in-line remediation providing opportunity to remain on track if objectives are met
• Competency-based end-of-year OSCE to evaluate clinical skills
• Small-group performance assessment of students combining checklist and facilitator narrative feedback to track milestone attainment and acquisition of competencies
• Assessment and application of knowledge via 3 spaced NBME Comprehensive Basic Science Examinations
• Pass/fail grading without reported class rank

Assessment in the clerkship phase features:
• Criterion-based grading: students must pass NBME subject exams, a standardized clinical experience, and mandated clerkship experiences
• Committee of clerkship directors responsible for summative grading that integrates narratives on student performance toward EPAs
• Pass-with-distinction/pass/fail grading with reported class rank

Option of obtaining Honors designation by:
• Attaining top quartile of the class on USMLE Step 1 examination and year 3 GPA
• Completing a research/scholarly project
• No history of remediation
• Good standing on all professionalism and personal development competencies

Pedagogy
Students participate in large- and small-group discussions, lectures, and laboratories. Application of asynchronously acquired knowledge to authentic, clinical problems is a hallmark of ACE, accomplished through diverse learning activities including case-based collaborative learning (CBCL), problem-based learning (PBL), flipped classroom, active case sessions, clinical skills and dissection laboratories, simulations, and multiple clinical experiences. Learning strategies involve peer-to-peer teaching, interprofessional education, faculty facilitation, preceptorship, self-directed learning, tutorials, video podcasts, and workshops. Teaching is complemented by individual coaching and support from learning communities.

Changes in pedagogy since 2010
Teaching strategies were changed to promote cognitive integration of foundational and clinical sciences in understanding clinical phenomena. Students are empowered to appreciate how application of scientific knowledge improves the health of patients and the public. Over 60% of preclerkship contact hours involve active learning activities. The primary active learning modalities are:

• CBCL: This novel activity combines asynchronous knowledge acquisition with small- and large-group problem-solving sessions. The closed-end inquiry of CBCL sessions aims to apply foundational and clinical science principles to understand the promotion of health and the causes, diagnosis, management, and prevention of disease.
• PBL: Expanded and standardized sessions include more cases, improved facilitator preparation, and better integration with course content.
• Flipped classroom: The number of sessions expanded significantly.
• Active case sessions: Novel, large-group discussions involving students, physicians, and foundational scientists aim to consolidate knowledge with clinical reasoning.
• Standardized patients and simulation: Sessions have been expanded, with an additional focus on interprofessional experiences.

Clinical experiences
• Third-year clerkships occur in family medicine, internal medicine, neurology, obstetrics–gynecology, pediatrics, psychiatry, and surgery.
• Clinical sites for required educational experiences include hospitals, private physician’s offices, residency clinics, rehabilitation facilities, long-term care facilities, safety net clinics, and Veterans Administration hospitals.
Initial clinical experiences occur in the Introduction to Doctoring course; learning clinical skills (history taking, physical examination) occurs through didactic teaching, standardized patient plus manikin simulation experiences, and personal study of resource materials.

Enrichment weeks have been placed at the end of each block in the first and second year of the curriculum.

Community-based learning opportunities occur in third-year clerkships. Students may complete part of their family medicine, neurology, pediatrics, psychiatry, and surgery clerkships at a rural Kansas site.

Required fourth-year rural preceptorship occurs in a Kansas community.

Curricular Governance
The Education Council is the faculty governance entity responsible for institutional oversight of the educational program. It makes recommendations to the Faculty Council and executive dean regarding program changes. The 16 voting members include elected and appointed faculty, the senior associate dean for medical education, students, and ex-officio representatives from the dean’s office. The council has 2 subcommittees: the Phase I Curriculum Oversight Subcommittee (comprising preclerkship block directors) and the Phase II Curriculum Oversight Subcommittee (composed of clerkship directors). Individual campus deans are responsible for managing resources for educational activities on their campus.

Educational Staff
The Office of Medical Education (OME) is administratively responsible for the planning, implementation, evaluation, and oversight of the curriculum; the development and maintenance of tools that support curricular delivery and management; and support of medical education research and scholarship. Key aspects of the OME include:

- Eighteen staff members and 5 faculty members
- Management of an internal educational grants program supported by the school’s medical alumni association
- Support of the Academy of Medical Educators
- Partnerships with educational staff on regional campuses and with offices and units involved in student support, faculty development, and graduate medical education

The executive dean, regional campus deans, senior associate dean, associate deans, and assistant deans on 3 campuses all contribute to managing undergraduate medical education, faculty development, and learner support.

See Figure 1—Curriculum governance.

Faculty Development and Support in Education
Faculty Development is provided by departments and the Offices of Faculty Affairs and Development on the Kansas City and Wichita campuses. Schoolwide introductory medical education intensives are offered annually along with longitudinal medical education courses, topical short courses, and a medical education scholarship course. Brief faculty development topics are also provided for departmental faculty meetings.

Intensive faculty development was critical for the success of the ACE curriculum. Specific development workshops were offered on small-group facilitation, flipped classroom, and writing NBME-style exam items. Workshops were provided at the school, campus, and departmental level to prepare for the move to competency-based assessment and integration of narrative comments.

Role of teaching in promotion and tenure
Educational activities, scholarship, and leadership are central to promotion and tenure considerations. The school has offered a nontenure clinical-scholar track since the 1980s and introduced an educator track in 2014 for educationally focused faculty.

For promotion, education is broadly defined, including teaching and assessment of learners in different educational environments, plus mentoring of trainees and others in research and education. The required documentation summarizes teaching achievements and highlights educational leadership and development of educational materials. The web-based faculty activity database system provides a robust means to document educational accomplishments. The school uses a Boyer-derived approach, recognizing educational scholarship as well as traditional biomedical research as evidence of career progression.

Building and implementing the ACE curriculum expanded leadership and curricular development roles for many faculty educators and provided multiple opportunities for educational scholarship to support academic promotion.
Academy of Medical Educators

The Academy of Medical Educators exists to develop, support, mentor, and energize a vibrant faculty to educate the next generation of physicians. The academy is made up of 35 elected medical school faculty and collaborates with the Office of Faculty Affairs and Development to improve teaching and educational scholarship. Academy members focus on educational scholarship and promoting best practices through monthly medical education journal clubs and quarterly research interest group meetings. The academy offers competitive research grants to support innovations in medical education and assessment and sponsors annual travel awards for faculty to present educational research at national and international conferences.

Regional Medical Campuses

Students complete their undergraduate medical education at 1 of 3 campuses, providing 1 curriculum in different learning environments.

<table>
<thead>
<tr>
<th>Regional campus</th>
<th>Type</th>
<th>Student enrollment</th>
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<tbody>
<tr>
<td>Salina</td>
<td>Entire MD program</td>
<td>32</td>
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<tr>
<td>Wichita</td>
<td>Entire MD program</td>
<td>208</td>
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See Table 1—Regional Medical Campuses.

We employ multiple mechanisms to ensure consistency and quality of educational experiences across campuses. Data from student evaluations plus performance and outcome data across the 3 campuses are analyzed, compared, and reported to educational oversight committees at regular intervals. The school’s administrative leaders are responsible for facilitating a comparable educational experience and ensuring that decisions made by the Education Council are enacted at each site. Communication among leadership, faculty, and students on each campus is paramount and maintained through regular electronic and in-person interactions.

References