Northwestern University Feinberg School of Medicine
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Medical Education Program Highlights

- Northwestern University Feinberg School of Medicine (Feinberg) is a large urban medical school with 634 students based in Chicago, Illinois. The curriculum has 3 phases. Phase 1 consists of foundational material and 14 organ-based modules. Phase 2 consists of 6 core clerkships, and Phase 3 is composed of advanced clinical clerkships. Feinberg’s curriculum is organized around 8 competencies: patient-centered medical care, communication and interpersonal skills, medical knowledge and scholarship, system awareness and team-based care, personal awareness and self-care, community engagement and service, continuous learning and quality improvement, and professional behavior and moral reasoning. We highlight several components of the educational program below; many of these are also described in a recent publication.1

- The Education Centered Medical Home (ECMH) is a longitudinal, immersive primary care clerkship that spans the entire undergraduate medical curriculum. Teams of 16 students, 4 from each class, are embedded into primary care clinics, many of which are in underserved areas. Students care for a panel of medically complex patients under the supervision of a faculty preceptor. Students attend ECMH clinic for 4 hours every other week and see patients in pairs (a third- or fourth-year student paired with a first- or second-year student). Students also serve as peer educators by investigating clinical questions and as health coaches by contacting patients for follow-up on laboratory or radiology studies, consultations, and clinical status. Students act as quality managers by compiling quality-of-care report cards and targeting areas of clinical care for improvement as part of an annual ECMH team quality improvement project. The ECMH serves as a real-world classroom for learning social determinants of health, chronic disease management, and clinical skills. Early reports show students who participate in ECMH report a more positive learning environment, higher quality of primary care training, and greater professional efficacy.2

- The Area of Scholarly Concentration (AOSC) is part of Feinberg’s mission to mentor and educate students to become inquiry-driven physician–scientists. This longitudinal, mentored scholarly project provides students the opportunity to identify an individualized area of independent study, collect and analyze data, and answer a hypothesis-driven research question. Areas of investigation are broad and may include basic science, clinical and translational medicine, global health, community and family health, and the medical social sciences. The AOSC culminates in writing a thesis before graduation; many students also submit peer-reviewed first-author publications.

- Feinberg fosters habits of self-assessment, personal improvement, and reflective capacity through the use of an electronic assessment portfolio. A faculty committee reviews each student’s progress toward Entrustable Professional Activities (EPAs) and the Feinberg competencies at the end of each curricular phase. A well-developed coaching system supports and guides students throughout the process.

- Synthesis and Application Modules (SAMs) are weeklong sessions interspersed throughout the curriculum. SAM sessions are highly interactive and simulation based. These sessions provide students with the opportunity to revisit previously taught concepts and to integrate material across modules using case-based learning and simulation-based education. For example, first-year students review a case of a patient with shortness of breath. The patient’s respiratory status worsens and ultimately requires mechanical ventilation for respiratory support. Despite improvement of the respiratory condition, the patient develops multisystem organ dysfunction. Throughout the SAM, students work in small groups within a larger class setting to manage care for this simulated patient. Students work together to answer questions involving pathology, physiology, pharmacology, genetics, and biochemistry that inform the patient’s evolving clinical care. This model allows for the synthesis, application, and integration of various elements in the curriculum in a simulated patient care setting.

- In August 2017, Feinberg’s Office of Diversity and Inclusion became the first medical school in the country to launch the Sustained Dialogue Program.3 This program has been used in college campuses throughout the United States to promote more engaged, cohesive, and diverse communities. Student participants are trained to facilitate longitudinal student dialogue groups that center around challenging topics such as race and privilege, religion, and mental health. This highly rated program provides students the opportunity to understand different perspectives to promote an inclusive campus community.

Curriculum

Curriculum description

- The Feinberg curriculum is composed of 4 elements (science in medicine, clinical medicine, health and society, professional development), 5 threads (lifestyle medicine, medical decision-making and diagnostic testing, health equity and advocacy, health care quality and patient safety, teamwork and leadership), and 2 longitudinal experiences (AOSC and
Each element and thread is fully integrated into each phase of the curriculum.

- Phase 1 consists of a Foundations module and 14 organ-based modules. The Foundations module introduces students to the fundamental aspects of basic, clinical, and health system sciences. Each subsequent organ-based module addresses normal and pathological processes in an integrated fashion. Learning in the context of patient problems and clinical care is emphasized. As described above, SAM modules are interspersed throughout Phase 1 to provide an opportunity for spaced repetition and application of prior content to solving new clinical problems.

- Phase 2 is composed of 6 required clerkships (surgery, medicine, pediatrics, obstetrics–gynecology, neurology, psychiatry), continuation of the longitudinal ECMH, and early elective experiences determined by each student's career preferences. Students also spend time in a monthly integrated curriculum (IC2) session incorporating basic and clinical sciences, health and society, and professional development.

- Phase 3 is composed of 4 required clerkships (subinternship, emergency medicine, critical care medicine, physical medicine and rehabilitation), 5 electives, and the longitudinal ECMH. Phase 3 culminates with the Capstone experience including rigorous assessment of EPAs to ensure each Feinberg student is prepared for residency in their chosen field.

**Curriculum changes since 2010**

- Feinberg launched a redesigned curriculum in 2012. The traditional structure was replaced with 3 phases as described above. The redesigned curriculum emphasizes 4 curricular elements and 5 threads designed to help students develop into evidence-based clinicians and researchers who provide cost-effective, safe, quality care as part of an interprofessional team.

- Formative assessments have been incorporated throughout Phase 1. Students attend weekly synthesis and application sessions in the form of interactive question-based content review. Practice exams are available to allow students to gauge areas of strength and identify areas that need attention before each module exam.

- Phase 2 begins earlier in the curriculum in the redesigned curriculum, in May of the second year. This provides students with additional schedule flexibility, allowing them to participate in electives and research to explore career interests.

- All students are required to complete a 2-week Capstone course before graduation. Students select a track based on their residency choice and have a series of small-group specialty sessions devoted to topics such as first night on call simulations, clinical skills sessions, and didactic content. A multistation clinical skills assessment gives students an opportunity to demonstrate mastery of several EPAs. Opportunities for deliberate practice are included in the course to ensure all students achieve skill mastery before graduation.

**Assessment**

- Feinberg uses a competency-based educational framework based on the ACGME competencies and the AAMC EPAs.

- The Feinberg assessment system uses a broad array of methods, including clinical performance assessments, OSCEs, peer feedback, 360-degree assessments, workplace assessments, simulation exercises, and oral and multiple-choice examinations.

- The Feinberg electronic portfolio system serves as a repository of each student's quantitative and qualitative assessment data. As part of the portfolio system, students demonstrate phase-appropriate achievement in 5 competencies: continuous learning and quality improvement, communication and interpersonal skills, patient-centered medical care, professional behavior and moral reasoning, and system awareness and team-based care. EPA assessment is currently being incorporated. Student portfolios are reviewed after each phase by a faculty committee. Students needing additional skills practice receive support through an individualized educational program.

See Supplemental Digital Appendix 1—Educational Program Objectives and Outcome Measures—at http://links.lww.com/ACADMED/A838.

**Pedagogy**

- A variety of pedagogical approaches are used in the curriculum, including but not limited to didactic lectures, problem-based learning, team-based learning, standardized patients, and simulations.

- Over the past 10 years, active learning strategies have been implemented throughout the curriculum. Our new state-of-the-art active learning classroom allows collaborative learning sessions where students can work together to apply knowledge to solve basic science and clinical problems.

**Clinical experiences**

- We are fortunate to have several major sites for clinical education located on the medical campus. These sites include Northwestern Memorial Hospital, the Ann & Robert H. Lurie Children's Hospital of Chicago, and the Shirley Ryan Ability Lab. Feinberg also has a major affiliation with the Jesse Brown Veterans Affairs Hospital. Required and elective community-based rotations also occur at the John H. Stroger Hospital of Cook County and several federally qualified health centers.

- The ECMH is a longitudinal clerkship for all students, described above.

- Early clinical training is a cornerstone of the Feinberg curriculum. Students encounter patients during the first week of class and patients are brought to the lecture hall during each module order to provide a clinical context for the science being taught.

**Curricular Governance**

In addition to centrally supported activities such as the Feinberg Simulation Center, the Galter Library, and the Clinical Education Center, funds are transferred from the Office of Medical Education to departments to support faculty in leadership roles, resources that are part of the clinical educational program, and administration of the clinical clerkship administration.

See Figure 1—Curriculum governance structure.
Education Staff

- The Augusta Webster, MD, Office of Medical Education provides central oversight and support for all aspects of the curriculum. The office encompasses curricular affairs, student affairs, registration and records, and the Honors Program in Medical Education, Northwestern’s BA–MD program.
- The senior associate dean for medical education oversees the Office of Medical Education and is responsible for the undergraduate medical education program. The senior associate dean is assisted by the associate dean for curriculum and the associate dean for student affairs. Additional support is provided by the assistant director of student affairs, the director of program evaluation and accreditation, the director of academic success, and the student wellness and support coordinator.
- The senior associate dean for medical education reports to the vice dean for education. Feinberg’s vice dean for education oversees the Honors Program in Medical Education, medical student admissions and the medical education program, a Masters in Physician’s Assistant program, the doctor of physical therapy program, and a prosthetics/orthotics program. The vice dean for education also has oversight over graduate and continuing medical education. The vice dean for education reports to the dean of the medical school.

See Figure 2—Medical education organizational chart.

Faculty Development and Support in Education

- The Feinberg Academy of Medical Educators (FAME) was established in 2010. FAME provides school-wide faculty development programming and recognizes faculty contributions to education at the school. FAME currently has 205 members.
- FAME provides monthly lectures and workshops and develops online modules available to all faculty. Recent offerings include topics such as adult learning theory, providing feedback, writing test questions, learner assessment, curriculum development, team-based learning, large-group teaching, active learning, mentoring, and simulation instructor training.
- FAME offers a 2-year Medical Educator Certificate Program to prepare clinical educators for excellence in teaching practice through participation in a variety of learning and teaching activities. Program participants attend FAME lectures, workshops, and meetings; review online resources; participate in directly observed teaching sessions; create a scholarly project; reflect on program activities; and compile an educator portfolio.
- A clinician–educator career track is available for faculty who contribute to the clinical, educational, and/or research missions of the school but whose major effort is in the areas of clinical practice, practice-related activities, and/or education. This is a non-tenure-eligible track.

Figure 1 Curriculum governance structure.
• The Department of Medical Education centralizes much of the educational programming, innovation, and education scholarship at Feinberg and its affiliated institutions. Secondary faculty appointments in medical education are awarded to select faculty with significant roles in education.

Initiatives in Progress

• We are in the process of developing a curriculum that prepares students to use artificial intelligence, digital technology, and data science as clinical tools to practice precision medicine as 21st-century physicians.

• We are aligning each ECMH with a community organization to develop and implement a community health plan aimed at improving a priority health need in a target community.

References