Stanford University School of Medicine

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Medical Education Program Highlights

The mission of medical education at the Stanford University School of Medicine is to educate and inspire leaders in medicine and science who will improve human health through discovery, innovation, scholarship, education, and delivery of outstanding patient-centered care. What makes Stanford unique is our Discovery Curriculum, initiated in 2017, expanding Stanford’s long-standing commitment to train academic leaders. The Discovery Curriculum provides diverse pathways for exploring scholarly pursuits and developing skills to prepare for careers as thought leaders in medicine. Although students can complete their MD degree in 4 years, the majority spend at least 1 extra year pursuing research or obtaining a master’s or PhD.

Unique features:

• Scholarly Concentration Program: Promotes in-depth learning and scholarship in diverse areas that complement medical training, including bioengineering, molecular medicine, informatics, clinical research, community health, health policy, medical education, biomedical ethics, and medical humanities, with additional application areas wherein students can apply knowledge in these core areas to subspecialties. Students work directly with a faculty mentor and complete structured coursework to develop critical thinking skills, skills in evaluating new data, and hands-on experience using methods of generating new scholarly information. Completion of a Scholarly Concentration project is a graduation requirement. To support student research and ensure that students who spend a fifth research year do not graduate with additional debt, Stanford provides more than $3,000,000 annually in competitive funding through our Medical Scholars grants programs, in addition to funding provided to MD–PhD students in our NIH-funded Medical Scientist Training Program (MSTP).
• Advanced degrees: In addition to the MSTP, students have obtained master’s degrees in diverse fields complementing medicine including clinical research and epidemiology, bioengineering, public health, public policy, health policy, medical anthropology, education, and business. Students benefit from the medical school’s location on the main university campus, enabling rich opportunities for scholarship in multiple disciplines.

• Berg Scholars Program: In 2018, Stanford launched a unique 6-year program combining MD–MS training in biomedical investigation. This program provides 5–6 students per year training as physician investigators. Berg Scholars work closely with a faculty mentor and split the second year of medical school over 2 years to pursue a basic science or informatics research project and spend the fourth year of medical school in full-time research, culminating in a master’s-level thesis, followed by clinical training in years 5 and 6.
• Cultural competence, population health, and health disparities: Practicing medicine requires training in implicit bias; cross-cultural interviewing; effects of socio-economic and racism on health and health disparities; immigration issues and health care; gun violence and public health; and sex, gender, and LGBTQ+ issues in health care. Stanford’s curriculum provides related instruction, discussion, simulation, and group activities to foster cultural competence and awareness of social justice issues.
• A community of support: In our Educators 4 CARE program, faculty from various medical fields recognized for compassion, advocacy, responsibility, empathy, and teaching excellence serve as small-group teachers and mentors in clinical skills, clinical reasoning, and professionalism for 5–6 students per class, from matriculation until graduation. Additional components of our support community include advising deans, student life dean, Student Wellness Office, learning specialist, on-site psychiatrist and counseling staff, program directors and mentors, and the Stanford Center of Excellence for Diversity in Medical Education.

Curriculum

Curriculum description

The Stanford curriculum includes 6 quarters of basic science and clinical preparatory instruction, Scholarly Concentration coursework and a research project, and completion of at least 64 weeks of clinical clerkship instruction. Basic science courses are organized by discipline during the first 2 quarters (Foundations of Medicine), then by organ system in quarters 3–5 (Science of Medicine). In year 1, in tandem with basic science courses, students participate in an early clinical experience (ECE), engaging in patient care either from the patient or physician perspective. The Practice of Medicine spans the first 6 quarters, covering the approach to the patient, physical exam, principles of the psychiatric interview, clinical reasoning, and advanced clinical skills. Specialized threads include nutrition, population health, psychiatry, cultural competence, quantitative medicine, health economics, pain management, addiction medicine, and LGBTQ+ health. In quarter 6, students take a multidisciplinary pathophysiology course synthesizing basic science and early
clinical learning as well as the Transition to Clerkships course. All students, including those obtaining additional degrees, complete the full curriculum as described.


Curriculum changes since 2010

The Discovery Curriculum strengthens our focus on scientific discovery, innovation, scholarship, and delivery of outstanding patient care. Curricular changes were threefold:

• New courses: In 2017–2019, we launched 4 new courses: Cells and Signaling in Regenerative Medicine, Pharmacologic Treatment of Disease, Pathophysiology Capstone, and Clinical Problem-Solving Capstone. Additionally, Human Anatomy, Embryology, Histology, and Neurobiology courses were reorganized.

• Early clinical experience: Launched in 2019, the ECE includes integration into the clinical setting with a chosen preceptor, development of concrete skills, and introduction to different career paths.

• Longitudinal scholarship via an extended curriculum: Beginning in the fall of 2017, students can apply to take the preclerkship curriculum over 3 years (rather than 2) to enable additional time for in-depth, longitudinal scholarship. This option was created in conjunction with the development of a Master of Science degree in Biomedical Investigation as part of the Berg Scholars program.

Flexibility extends throughout the curriculum, allowing for career exploration, research opportunities and scholarly pursuit, and pursuit of dual degrees.

Class size changes
We do not anticipate significant expansion of Stanford’s 90-student class.

Assessment

Stanford has a detailed set of program objectives describing expected competencies. For each, a series of assessments have been developed to assure that trainees achieve the objectives (or receive remediation as needed).


Program objectives were originally based on ACGME domains of competence. We adopted the learning outcomes–oriented language of the Physician Competency Reference Set program objectives and added the institutionally developed domain of competence, Discovery, with its own set of objectives.

We are currently working to incorporate the Entrustable Professional Activities (EPAs) framework into existing clinical assessments. In AY 2020–2021, we will begin implementing workplace-based assessments in selected core clerkships as part of the EPA approach.

There are currently no parallel curricula or tracks offered to meet core educational objectives. Dual degrees, for instance, are considered to be supplemental and not part of the core curriculum.

Pedagogy

Stanford uses a variety of approaches to achieve program objectives in addition to traditional lecture:

• Case-based and problem-based learning
• Clinical experiences
• Discussion: large group (> 12)
• Discussion: small group (≤ 12)
• Laboratory sessions
• Peer teaching
• Preceptorship
• Role play/dramatization
• Self-directed learning/tutorials
• Simulation/standardized patients
• Team-based learning
• Video/podcast/flipped classroom
• Virtual patients using 3-dimensional simulation
• Workshops

Changes in pedagogy since 2010

Compared with 2010, the current curriculum emphasizes active participation and interaction by learners and less lecture time. We estimate that about 30% of basic science teaching is by lecture, with the remainder in interactive small groups, simulation labs, flipped-classroom sessions, and team-based learning. Students experience direct patient care during their first year through the ECE and Practice of Medicine courses.

Required longitudinal experiences

In the preclinical curriculum, students follow patients longitudinally in the required ECE. When students enter clinical training, they may enroll in a continuity of care clerkship, wherein during weekly (half-day) clinics students follow a patient panel with an outpatient physician preceptor over a 9- to 12-month period. Students also have extensive longitudinal research experiences, described above.

Clinical experience first encounter

As part of the Discovery Curriculum, students are required to participate in the ECE in their first year, where they are exposed to patients, and their stories in mentored clinical settings.

Required and elective community-based rotations

In the preclerkship curriculum students may provide health care at local community clinics. Additionally, there are 2 required clinical clerkships providing community-based clinical experiences.

• Preclerkship students lead an annual influenza vaccination campaign, named “Flu Crew,” which vaccinates thousands of local students as well as uninsured residents through drives at local and regional churches, community centers, and farms.
Students also support 2 community clinics that provide free medical services for indigent and uninsured patients. These experiences are part of the Practice of Medicine course, volunteer based, or for academic credit as elective coursework.

- In our ambulatory and emergency medicine core clerkships, students spend 3 weeks serving in a variety of outpatient clinics at Stanford Hospital and Clinics, the Palo Alto Veterans Administration Medical Center, or several community clinics. Students spend an additional 3 weeks in the Emergency Department primarily at Stanford Hospital, a Level 1 trauma center.
- In our family medicine core clerkship (3 weeks), students are distributed to outpatient family medicine clinics throughout our community, in San Francisco, and in Humboldt County.

Challenges in designing and implementing clinical experiences for medical students
Stanford has ample high-quality clinical training facilities in diverse clinical settings. The cost of providing that training, however, has risen significantly since 2010 as training sites seek more financial support for faculty preceptors involved in teaching. It is a challenge at Stanford, as at many medical schools, to find an appropriate yet affordable model for faculty compensation at affiliated sites.

Curricular Governance
The Faculty Senate is advisory to the dean of the School of Medicine. Under the dean’s direction, the Faculty Senate has curricular oversight. There are 4 committees that report to the Faculty Senate that manage admissions; student scholarship; the curriculum; and student progress, professionalism, and promotion. Each committee is made up of 12–15 faculty members approved by the Faculty Senate’s Executive Committee. Stanford has a collaborative model of curriculum oversight. Whereas these committees are part of centralized governance, courses and clerkships are organized by departments with input from education consultants in the Office of Medical Education (OME).

See Figure 1—Curricular governance.

Education Staff
The OME has primary responsibility for the MD program, including oversight of the curriculum and its associated committees, course and clerkship management, evaluation and continuous quality improvement, curriculum data analytics, and medical student research and scholarship. The office reports to the senior associate dean for medical education, who also has responsibility for GME and CME. OME is led by the associate dean for curriculum and scholarship, who has direct responsibility for the curriculum and its core faculty leaders; the assistant dean for curricular affairs, who manages the curriculum and its associated staff; and the associate dean for the OME, who provides oversight of operations and finances and manages additional staff supporting the curriculum. Twenty-three administrative staff support the curriculum and its faculty leaders.

See Figure 2—Medical education leadership.

The primary medical education staff in OME support UME only and are not responsible for other areas of the medical education continuum. Student affairs are handled by the Office of Medical Student Affairs; faculty leaders and staff members collaborate closely in the OME.

Stanford does not have a department of medical education. The majority of faculty appointments, including adjunct appointments, are based in clinical and academic departments. The OME appoints a limited number of adjunct faculty each year who are involved in clinical teaching at affiliated sites.

Faculty Development and Support in Education
Professional development for faculty as educators
Stanford’s innovative Teaching and Mentoring Academy (TMA) is involved in promoting teaching and mentoring excellence. The TMA offers courses and lectures with the goal of improving basic science and clinical teaching. The TMA has begun 1-on-1 peer feedback sessions and tutorials using skilled faculty to provide input and suggestions to improve teaching quality. Stanford offers a clinical teaching seminar series covering various topics in medical education that culminates in an honors certificate. In addition, faculty are encouraged to participate in courses and workshops offered by the main campus Center for Teaching and Learning.

Role of teaching in promotion and tenure
Teaching performance is emphasized as a criterion for promotion by the School of Medicine’s various appointments and promotions committees. Further underscoring its commitment to teaching, Stanford has a dedicated clinician educator line for faculty. For promotion on this line, faculty must receive outstanding evaluations for their personal teaching performance and demonstrate scholarship in medical education,
through peer-reviewed publications and/or presentations at national education meetings.

**Initiatives in Progress**

- Refinement of the Discovery Curriculum, first introduced in AY 2017–2018
- Innovations in medical education emphasizing interactive learning and enhanced learner engagement
- Development of a curriculum on social justice, diversity and tolerance, and societal citizenship
- Improvement to the student wellness curriculum
- Further development of dual-degree training, including funding opportunities