University of Connecticut School of Medicine
Christine Thatcher, EdD, Ellen Olarsch Nestler, MD, and Melissa R. Held, MD

Medical Education Program Highlights

During the 2016–2017 academic year, a new curriculum, called MDelta (Making a Difference in Education, Learning, Teaching, and Assessment), was implemented. Highlights of this innovative curriculum include:

- A lecture-free Stage 1 curriculum is case based, patient centered, and uses team-based learning (TBL) as the predominant pedagogy via an innovative and integrated approach to assessment.
- Medical students receive a certificate of public health in social determinants of health and disparities.
- Laboratory teaching occurs in the human anatomy lab (cadaveric dissection), the virtual anatomy lab (radiology workstations, Anatomage tables, ultrasound), and the virtual microscopy lab.
- Stage 2 incorporates longitudinal courses, including radiology and geriatrics. In addition, topics such as ethics, patient safety, and basic science content are threaded throughout clerkship conferences.

Curriculum

Curriculum description

Stage 1—Exploration—is approximately 18 months and begins with a 2 ½-week “launch” period that consists of orientation to the curriculum and to medical school, along with a mini-course in history and physical examination. Patient instructors (standardized patients), along with faculty, provide formative feedback. Students are assigned to a longitudinal continuity practice (Clinical Longitudinal Immersion in the Community, CLIC), which will continue for 3 years. The experiential Patient Advocacy in Communities, Teams, and Health Systems (PACTS) course is part of the preclerkship curriculum, which also includes the doing course (Delivery of Clinical Care, DoCC). Courses titled Case Oriented Essentials (CoRE), Vertically Integrated Teams Aligned in Learning (VITAL), and Laboratory (including cadaveric dissection as well as technology-enhanced virtual laboratory experiences) provide the basic science curriculum and biopsychosocial components so essential to medical training. TBL, along with problem-based learning (PBL) in the clinical reasoning and VITAL courses in the second year comprise the main pedagogical underpinnings. Scholarship & Discovery is introduced with required sessions on topics such as research design, formulating research questions, and data acquisition and analysis, and culminates in a capstone project in Stage 3.

Stage 1, the preclerkship curriculum, is made up of five 10-week blocks. Each block is followed by a 2-week Learning Enhancement and Assessment Period (LEAP) intersession. LEAP begins with an integrated examination across courses in Stage 1. For students who have demonstrated a gap in knowledge or who require additional skill development, LEAP provides time and faculty support, and in some cases a reassessment focused on the particular gap.

The summer between the third and fourth blocks is 12 weeks in length, allowing ample time for research or other opportunities for career or scholarly exploration.

Stage 2—Clinical Immersion—begins with the clinical transition period in March/April of the second year. This flexible time is mostly used for board study and may include electives, scholarly work, and/or vacation. Required clerkships include ambulatory medicine, inpatient medicine, ambulatory pediatrics, inpatient pediatrics, neurology, family medicine, psychology, surgery, and obstetrics–gynecology, as well as longitudinal geriatrics and longitudinal radiology elements. Radiology is introduced during the Stage 2 kickoff along with skills training, orientation, and other activities to prepare students for the clinical learning environment. Clerkships are 4 or 6 weeks in length and organized into four 12-week blocks. There are 2 mandatory “homeweeks” (fall and spring). An additional 8-week block at the end of Stage 2, the advanced clinical block, provides time for Step 2 board study, electives, scholarship, vacation, and an option to complete a required Stage 3 clerkship if prerequisites are met. VITAL and radiology content are threaded within the clerkships and homeweeks.

Stage 3—Transformation—includes required clerkships: 4 weeks each of emergency medicine, critical care, and an advanced inpatient experience in either medicine, family medicine, pediatrics, or surgery, as well as 2 weeks of a Transition to Residency (TTR) course. Students complete their scholarly capstone in Stage 3, as well as 20 weeks of electives.


Curriculum changes since 2010

There have been a number of changes leading up to curricular reform in the past 10 years, with the culmination leading to the new MDelta curriculum. There was a 5-year planning process and implementation in the fall of 2016 (class of 2020) with these highlights:

- The educational program objectives are based on the ACGME domains of competence. Additionally, the new domains,
interprofessional collaboration and personal and professional development, were added as part of the curricular reform process through the recommendation of the AAMC.

- The radiology clerkship was first developed as a required 2-week experience in year 4 and then transformed into a longitudinal clerkship during year 3 (Stage 2).
- Moved from a traditional 2 + 2 curriculum to an 18-month Stage 1.
- Reduced contact hours per week from an average of 32 hours to 22 required hours in Stage 1.
- Removed all lectures and replaced with primarily TBL pedagogy. Modified PBL and small-group conferences remain. The Clinical Reasoning course was added back after the first year of implementation.
- Lab modifications include adding virtual anatomy and a handoff system, as well as point-of-care ultrasound and radiology workstations, to traditional cadaveric dissection.
- The VITAL course was developed to provide the biopsychosocial aspects of medicine across the 4 years of medical school, incorporating interprofessional education and providing content that contributes to each medical student earning a certificate in Public Health in Social Determinants of Health and Disparities.
- The PACTS course (previously known as Clinical Home) is experiential and complements DoCC and VITAL by providing systems- and team-based content with a focus on health systems science.
- Implementation of LEAP intersessions during Stage 1, which provide integrated examinations and, when needed, individualized knowledge or skill development after the assessment period. This innovation has led to a reduction in summer remediation and a reduction in the number of students needing to repeat an academic year.

- Change in clerkship structure to four 12-week pods.
- Changes in student assessment have included the implementation of shelf exams in family medicine and neurology, joining surgery, obstetrics–gynecology, and psychiatry.
- TTR, piloted as an elective, is now a required course in year 4 in MDelta with skill and experiential training to prepare for internship.
- Incremental increase in class size from 85 students to 110 incoming medical students in the fall of 2019. The increased class size has required additional resources and is especially impactful on clinical capacity.

**Assessment**

See Table 1—Medical Education Program Objectives and Assessment Methods.

**Pedagogy**

TBL constitutes the main pedagogical approach in Stage 1. Students are required to be prepared through the self-directed learning process, which includes review of curated and homemade online videos, readings, and/or tutorials. There are no lectures. Peer-to-peer feedback is a critical aspect of the pedagogy.

The laboratory course uses a modified TBL format and is an integrated experience, including gross anatomy, virtual anatomy, histopathology, radiology, physiology labs, and an introduction to ultrasound. The doctoring course (DoCC) is delivered in small groups with a physician, allied health professional, and fourth-year student co-facilitating; it builds upon and augments the experience of students at their CLIC sites. CLIC is a 3-year curriculum that provides students with a longitudinal immersion and mentorship experience in a community-based (primarily)

---

Table 1

Medical Education Program Objectives and Assessment Methods

<table>
<thead>
<tr>
<th>Medical education program objective(s)</th>
<th>Assessment methods</th>
</tr>
</thead>
<tbody>
<tr>
<td>Competency 1: Patient care</td>
<td>Preclerkship exams; clinical skills assessments all stages; clerkship required observations; clerkship evaluations; advocacy project; handoff in lab; Transition to Residency (TTR) course observations</td>
</tr>
<tr>
<td>Competency 2: Medical knowledge</td>
<td>Preclerkship exams; clerkship evaluations; VITAL assignment Stage 2/3</td>
</tr>
<tr>
<td>Competency 3: Practice-based learning and improvement</td>
<td>Stage 2 required curriculum; examinations Stage 1 and 2/3; scholarly capstone; lab assessments related to self-directed learning; clerkship evaluations and observation</td>
</tr>
<tr>
<td>Competency 4: Interpersonal and communication skills</td>
<td>Preclerkship examinations, clerkship evaluations and observations, clinical skills assessment, VITAL Stage 1 and 2/3 assignments; human anatomy and lab handoff process; course evaluations in lab and delivery of clinical care (DoCC)</td>
</tr>
<tr>
<td>Competency 5: Professionalism</td>
<td>TBL peer evaluations; Clinical Longitudinal Immersion in the Community (CLIC) evaluations; TBL peer evaluations; Stage 2 clerkship evaluation; DoCC examinations; HIPAA training and assessment; VITAL/Certificate Social Determinants of Health &amp; Disparities (SDH&amp;D) projects</td>
</tr>
<tr>
<td>Competency 6: Systems-based practice</td>
<td>Preclerkship examinations; DoCC examination; launch assessment; PACTS examinations; VITAL homework assignment; clerkship evaluations; CLIC evaluations; advocacy project</td>
</tr>
<tr>
<td>Competency 7: Interprofessional collaboration</td>
<td>TBL peer evaluations; clerkship evaluations; preclerkship examinations, critical care observation; PACTS examination; lab evaluation, TBL peer assessments; TTR</td>
</tr>
<tr>
<td>Competency 8: Personal and professional development</td>
<td>DoCC journal reflections and assessment; clerkship evaluations; TBL peer evaluations; clinical skills and CLIC assessments; coach goal setting</td>
</tr>
</tbody>
</table>
generalist practice for a half day each week. The Clinical Skills Assessment Program provides teaching and assessment activities for medical students during each of their 4 years of school. Using standardized patients called patient instructors, the program assists students as they learn the skills of taking a medical history, doing a physical examination, and communicating with patients. Simulation is included in each of the 4 years of the curriculum. PBL is used in 2 courses in year 2.

Stages 2 and 3 are clerkship based and consist of both ambulatory and inpatient experiences along with centralized case-based interactive conferences administered via small-group discussions. Workshops, such as in sports medicine, as well as practice in simulation and hands-on experiences are also used. Students in their fourth year may become preceptors/teaching assistants (near-peer teaching) through a developed program that provides principles of adult learning and reflection.

Clinical experiences
There are several types of clinical sites used for required educational experiences. In addition to the university hospital, we partner with 4 major academic teaching hospitals, which are geographically close to the school of medicine, in addition to a number of community teaching hospitals. Many outpatient practices are used for the required ambulatory clerkships in family medicine, internal medicine, and pediatrics, along with CLIC and other clerkship experiences.

• CLIC is a 3-year required half day per week experience in an outpatient office (predominantly primary care) that provides a longitudinal experience for learners. In addition, through an application process, students may opt to attend another type of practice or specialty, alternating weeks with their usual CLIC, for the final 6 months of the required period.

• Early introduction into the clinical environment has been a philosophical mainstay of our curriculum for decades.

Students' first clinical experiences occur when they begin at their CLIC sites (see above) in mid- to late September of year 1.

• There are always challenges faced in the design and implementation of clinical experiences for medical students. This past decade introduced a new medical school in Connecticut, as well as a regional campus of an out-of-state institution. That fact, along with the state-mandated increase in class size at our institution, has required additional sites to assure excellent quality clinical experiences. Other types of health professions learners (i.e., APRN, PA) also lead to competition in the clinical environment.

Curricular Governance
The CUME (Committee on Undergraduate Medical Education) serves as the school's curriculum committee for the educational program leading to the MD degree. It approves policies for all aspects of the undergraduate curriculum and determines the structure of the curriculum, educational philosophy, and overall curriculum objectives, as well as criteria for student evaluation, promotion, and graduation. This committee oversees management of the curriculum as well as the ongoing review of individual courses, segments of the curriculum, and the curriculum as a whole (via the Curriculum Evaluation Committee). The Curriculum Advisory Committee uses our mapping tool and other resources to identify gaps and redundancies in the curriculum.

See Figure 1—Governance and operational support.

See Figure 2—UME leadership structure.

The Office of Curricular Affairs has central oversight and coordination of each stage of the curriculum, as well as assessment and accreditation for undergraduate medical education. Graduate medical education and continuing medical education are housed in separate offices responsible for their respective areas.

---

Figure 1 Governance and operational support.
The Office of Curricular Affairs works closely with departmental chairs on distribution of educational FTE and oversight of educational efforts for teaching, assessment, and coaching. Faculty-level directors are provided protected time in the following areas: Stage 2, clinical skills, SIM, student affairs, academic educational affairs, admissions, social and behavioral sciences, basic sciences including laboratory, course directors, clerkship directors, global health, coaching, and wellness.

The student affairs team includes the associate dean for medical student affairs, 2 part-time faculty co-directors, and the assistant dean of admissions, along with support staff. Curricular affairs faculty and staff work closely with student affairs personnel, but have a discrete role in operationalizing the curriculum.

There are several professional categories including medical educator. Faculty are engaged in teaching, research/scholarship, patient care, and other professional activities. Teaching is expected and teaching excellence is required for senior rank promotion. The nature and extent of the other criteria will vary among faculty and professional categories. Teaching excellence can be achieved by participating in educational activities of medical students, residents/fellows, graduate students, and postdoctoral students.