Medical schools are a place where change is a constant. Students transform into physicians, and programs evolve to reflect changes in healthcare and new thinking about education. One ever-present fact is that the first year of medical school is stressful, fast-paced and arduous, with scads of information to memorize and master.

Although there’s no getting around the need to learn the building blocks of medicine, educators are finding fresh approaches to this first year. They’re teaching traditional topics in creative ways while weaving in new ones and adding clinical experiences.

These changes reflect national trends: Medical schools are requiring students to master core competencies in areas such as scientific inquiry and interprofessional collaboration. They’re striving to make their curricula relevant to a healthcare system in flux and to prepare medical students to become good doctors no matter the setting in which they practice.

This particular making over of medical education has been underway for some time. In 1996, the Association of American Medical Colleges (AAMC) launched an initiative to help medical schools revise their programs to improve quality and better prepare students for their careers. Two years later, it released guidelines to help them get the ball rolling. In 2010, a century after Abraham Flexner published his evaluation of American medical schools, 128 medical schools in the United States and Canada reported retooling their programs, says Maryellen Gusic, MD, chief medical education officer for the AAMC.

“They are adhering to a new paradigm for how we think about building curricula, that is, defining the outcomes we are trying to achieve to ensure students are ready for the next stage of training. And schools are using new teaching strategies so that we make learning relevant and so students remember what they learned and can apply it in the care of patients,” she says.

Many schools have moved away from the traditional format of two years of science/two years of clinical training, bringing clinical experiences to the forefront and adding content on pressing concerns such as the social and behavioral determinants of health, geriatric medicine and palliative care. “They’re developing students’ inquiry skills and guiding them to be lifelong learners,” Gusic says.
At Minnesota’s medical schools—Mayo and the University of Minnesota—these national trends are playing out. And the changes are evident as early as the first year. Read on to learn what the first year is like.

**MAYO MEDICAL SCHOOL**

Mayo Medical School takes a block approach to its curriculum, which means students focus intensely on one topic at a time for three to seven weeks. During the first year, they concentrate on scientific and clinical foundations, and the curriculum is designed to help them see the clinical application of the scientific principles they’re learning. For example, in the Basic Structure block, students study histology, biochemistry and genetics and hear from patients who have had the diseases they’re learning about. In the Principles of Disease block, they take microbiology and pharmacology and study the clinical presentations of infectious diseases and the corresponding therapies. Students also take a year-long course called “Basic Doctoring,” in which they learn how to take a history and do a physical exam.

In between blocks, they can take selectives, during which they can do such things as focus on developing skills (surgical techniques, for example), shadow clinicians to explore a specialty, do research or engage in service abroad or closer to home.

The selectives, which usually last a week, have been a highlight for first-year student Maggie Cupit, who is originally from Mississippi. As a former cancer patient, she intends to become a pediatric oncologist. To that end, she used one selective to shadow doctors in the pediatric hematology/oncology department at St. Jude Children’s Research Hospital, where she was treated for Ewing’s sarcoma as a teenager. Cupit spent another alongside a radiation oncologist at Mayo and another working on clinical research. She also did one at Cardinal Glennon Children’s Hospital in St. Louis, where she shadowed an adolescent medicine specialist who worked with girls with severe eating disorders.

“The selectives have been great,” she says, explaining that they have allowed her to see and do things students at other medical schools may not see or do until their third or fourth year. “I know what I want to do with my career and what inspires me to practice medicine, so I am able to pursue that now,” she says. “For my classmates who are undecided, it allows them to figure out what they want to do sooner rather than later.”

The scheduling format, as well as Mayo’s pass/fail system, has benefited Cupit in another way, too. She hasn’t felt the constant pressure she expected to feel during her first year of medical school. “Some [blocks] have been stressful and some have not been stressful,” she says. Anatomy was one of those high-pressure times. Students had seven weeks to master the material, which some programs spend a semester or year teaching. To Cupit, it felt like boot camp: “It was a very formative experience. I think Mayo’s intent is to put students in the mindset that we can do anything. I didn’t know I was capable of learning so much in such a short period of time, and surprisingly, much of what I’ve learned has stuck with me.”

That was eye-opening, she says, because it offered her insight into caring for people with addictions.

Mayo recently added coursework in leadership and wellness, says Dean Sherine Gabriel, MD. The 14-session well-being curriculum aims to prevent stress and burnout—a problem that plagues both students and practicing physicians. Gabriel says they are striving to teach students how to better manage their stress so they can enjoy long careers in medicine. They also learn about varying leadership styles and assess and develop their personal approach.

Mayo also is partnering with Arizona State University on several initiatives. One is aimed at educating students in the science of health care delivery. The two schools are developing a four-year curriculum that will culminate in a certificate. First-year medical students will go through two blocks that will cover topics such as health policy, health law, health care economics, social determinants of health, population health and interdisciplinary teamwork.

In addition, Mayo is working with Arizona State to create online modules that cover material typically included in a foundations class such as biochemistry or microbiology. Students will learn the core content online, then apply the material during small-group discussions in the
classroom and in the clinics. Mayo is moving toward a more longitudinal approach to medical education as well, so students will work at their own pace to master core competencies.

“Our goal is to train the physician leaders of tomorrow, not only to heal their patients but also to help heal our ailing health care system,” Gabriel says.

UNIVERSITY OF MINNESOTA MEDICAL SCHOOL DULUTH

A block system is also used at the University of Minnesota Medical School’s Duluth campus. Students begin the first year with a foundations block designed to help them acquire core knowledge about topics such as biochemistry, histology and genetics, which they need in order to be successful in subsequent courses.

In the next blocks, in-depth teaching about an organ system is integrated with foundational subjects like anatomy, physiology and pathology. This way, students get the big picture of each system, says Alan Johns, MD, interim regional campus dean and assistant dean for medical education and curriculum. (Instructors used to teach separate courses on these topics. Then the 60-student class would go on to learn about each organ system.) “We found that the best way is to understand the whole system rather than bits and pieces at a time,” he says.

A block might be followed by a clinical experience or a two-week session on a topic such as behavioral health, population health, or biostatistics and epidemiology. The clinical training generally takes place in a rural community (Duluth is known for its focus on rural medicine). First-year students take a two-week introduction to rural family medicine that includes a community visit, exploration of issues in rural medicine, and lessons in taking patient histories and physical exams. Throughout their first two years, they spend a total of eight weeks in a rural preceptorship, where they work one-on-one with family physicians in a variety of settings.

The biggest shift underway in Duluth is related to teaching. Faculty have been transforming their teaching style from “death by Power Point” to active learning. Now, half of the subject matter is presented in livelier formats. In neuroscience, for example, students studied the case of a patient with metastatic prostate cancer and chronic pain. They worked in small groups to discuss and research the patient’s physiology, psychology and pathology, then developed a treatment plan. “Students need to be engaged so learning can occur. Sitting in a lecture is a teacher-centered process; students hear but they don’t really learn,” Johns says. “But if they are actively involved in small groups and discussions, they will retain the knowledge better.”

The new approach is bearing fruit, as Duluth students’ scores on the national board exam have increased 11 percent in the past four years and are now above the national average. “It’s because of the way we’re teaching,” Johns notes. “Guided learning is more effective than me just telling you something.”

Instructors are encouraged to innovate. In one class covering embryonic development, students used clay to create models of the brain and brain stem. “There are so many different ways to teach a topic, and you can see the creativity of the faculty come out in that,” says first-year student Augie Lindmark.

Lindmark, who is originally from Red Wing, chose Duluth because of its emphasis on rural medicine. During one of his clinical experiences, he spent a week at CentraCare Health in St. Cloud, where he previously worked with immigrant and refugee populations while serving as an AmeriCorps volunteer. By the end of the week he was taking histories, doing physical exams and presenting patients’ cases to his preceptor.

Lindmark says learning the clinical side of medicine is considered a core part of the curriculum. “Being able to tell if your patient is stressed is a procedure in itself, and it takes as much practice as suturing or doing a biopsy,” he says. “I feel lucky to learn these skills concurrently while learning the science and art of medicine.”

UNIVERSITY OF MINNESOTA MEDICAL SCHOOL TWIN CITIES

Transitioning from student to doctor is top of mind at the University of Minnesota Medical School, Twin Cities, and it starts on the first day of orientation. Faculty prompt first-year medical students to change their personal outlook—from that of a student to that of a physician—and to think about what kind of physician they want to be. Together, the 170 students in the class write a class oath, which they read at their white coat ceremony. It’s a
powerful moment and a declaration of commitment, says Kathy Watson, MD, senior associate dean for undergraduate medical education.

Students spend their first semester taking three courses that address both the scientific and clinical sides of medicine. In Human Structure and Function, the Science of Medical Practice and Essentials of Clinical Medicine, the students delve into the micro (histology and molecular biology) as well as the macro (public health and translational research). By second semester, they go deeper into various subjects.

Clinical experiences used to start in the second year; but now first-year students take a three-part Process of Care clerkship, where they work with primary care physicians in inpatient, outpatient and long-term care settings.

Leaders at the U have been working on changing their program for the past six years in response to both national trends and student pleas for more emphasis on such things as public health, quality improvement and patient safety. They’ve launched initiatives focused on the students’ learning environment, how and what is taught, and using technology for teaching, Watson says.

Throughout years 1 and 2, students meet in small groups to discuss patient cases that are related to the scientific courses they are taking. They also participate in a faculty advisor group, which meets periodically throughout all four years. These groups can serve as a sounding board—a place where they can share how they felt, for example, when their first patient died. “We knew that students felt adrift,” says Watson of the reason for creating the small groups. “We wanted to select faculty who are active clinicians and can develop long-term relationships with students. They can connect with them on career advice or on resources or research.”

Because students have stressed they want more emphasis on team practice, first-year students on both the Duluth and Twin Cities campuses now take a course called Foundations of Interprofessional Communication and Collaboration, along with nursing, dentistry, pharmacy, and public health students. The course teaches them about teamwork and collaboration, as well as professional roles and responsibilities, ethics, decision-making and communication.

Another shift underway on the Twin Cities campus is related to teaching. Instructors now use more small-group learning and flipped classroom experiences. Instead of a professor lecturing, class time might be used to dissect clinical scenarios or gauge the students’ mastery of information with an audience response system.

The school also is incorporating more team teaching, pairing basic scientists and clinicians, says Jeffrey Chipman, MD, assistant dean for curriculum. “The basic scientist can explain why a concept matters and the clinician can explain how to apply the concept in clinical practice,” he says. “It keeps students engaged, and it explains why they are learning what might seem to be an obscure biochemical pathway.”

First-year student Sameena Ahmed, who is from Savage, Minnesota, has appreciated this approach. “They try to connect the classes with each other. In anatomy, when we learned about the shoulder, they set it up so we were doing physical exams of the shoulder at the same time,” she says. “It helped because it was fresh in my mind to look at the exterior of a living body and then go into the anatomy lab and see what it looks like internally.”

Ahmed says the Essentials of Clinical Medicine course—which she calls the “How to be a Doctor” class—has been especially valuable to her. In small groups led by a physician facilitator, they discuss bioethical issues and learn how to interview patients and do physical exams.

Ahmed has put some of that learning into practice while volunteering at the student-run Phillips Neighborhood Clinic in Minneapolis. There, she works as a Spanish language interpreter. “It’s easy to get involved in many things,” she says. “There are a lot of resources to do worthwhile work right now and people willing to work with us and cultivate our interests.” MM

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