Three decades after earning their M.D.s, two alumni return to experience today’s curriculum.

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photography by RAJ CHAWLA

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We graduated from the College of Medicine in 1975 soon after the last “new” curriculum of 1967 began. This spring we spent a week on campus to see first-hand the Vermont Integrated Curriculum (VIC), introduced in 2003. We describe here what’s new and include our reactions as alumni and veteran clinicians.

Thirty-five years ago, when we took our first elective away from UVM, we wondered if medicine might be practiced differently outside Vermont. What if we’d been coddled at UVM and wouldn’t be able to keep up with the big boys? Students at UVM need not worry about that now. Today’s medical students are scrutinized very closely. In today’s curriculum their competency is tested relentlessly by scores of people. There’s no coddling here.

First, for our fellow alumni, an explanation of some terms. The block of time we knew as Basic Science is now Foundations, a composite of Fundamentals, Systems Integration and Convergence; Clerkship is still Clerkship; Senior Major is now called Advanced Integration.

There are more tests now, big and small. Written tests, lab tests, and tests of clinical examination skills. If you need remediation, you’ll know and you’ll get help. Feedback on tests is prompt. Optional sessions allow students to review test results individually or in small groups. One student explained to us that the teachers don’t have to do this, but “they want us to understand and
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spotlight sweeps repeatedly to the clinic, where real instruction is grounded in hard-core science but the evaluation skills. Local Vermonters come to class to study. Meanwhile, students learn pertinent physical exam skills. The final is a week spent studying shock, a dramatization of pathophysics, but only after a test on what is known. This point, students dive deeply into pulmonary physiology, "Cardiovascular, Respiratory, and Renal" unit. At the end of the Systems Integration, this time as part of the Fundamentals segment, they study gross and microscopic anatomy of the lungs for two weeks, but with an important difference: simultaneously. Truly integrated, courses now connect to each other. Each week the content is woven together as beautifully as a capillary network.

The Foundation segment lasts 18 months. Alumni would recognize much of Fundamentals: anatomy, physiology, and biochemistry. For instance, students study gross and microscopic anatomy of the lungs for two weeks, but with an important difference: simultaneously they’re learning pulmonary physiology, radiology of the chest, interpretation of blood gases, and physical examination of the chest.

Our example, pulmonary medicine, reappears in Systems Integration, this time as part of the "Cardiovascular, Respiratory, and Renal" unit. At this point, students dive deeply into pulmonary pathophysiology, but only after a test on what they’re learning in Fundamentals. For this course the finale is a week spent studying shock, a dramatization of three organ systems bound together. Meanwhile, students learn pertinent physical examination skills. Local Vermonters come to class to describe their struggles with relevant diseases. All instruction is grounded in hard-core science but the spotlight sweeps repeatedly to the clinic, where real people deal with missing genes or a missing lung.

Systems Integration is aptly named. Attending class was like watching a jeweler hold a precious stone up to a lamp, examining every facet. The College’s virtuosic faculty are the jewelers here. In another course, "Nutrition, Metabolism and Gastro-intestinal," the faculty define how the brain, liver, pancreas, duodenum, visceral fat, and skeletal muscle all cooperate to control glucose. By week’s end, the logic of modern-day treatment of diabetes is unassailable, so meticulously have they reviewed basic metabolism and endocrinology. The inescapable conclusion is that biochemistry and physiology are wonderful tools at the bedside. Surgeons concurrently teach examination of the abdomen, again linking content to practice.

The whole curriculum is on-line at a secure website. COMET (College of Medicine Educational Tools) is our award-winning educational technology. Lecture material is available on COMET as PDF files and podcasts, but printed handouts are available in class too. There are interactive and virtual COMET tools to dazzle and tempt any student. (You can get a taste of these tools by trying the demo on the College’s website.) Students study everything on-line from histology and gross specimens to digital x-rays. Scheduled on-line quizzes appear every week. More comprehensive tests are taken together in class on-line. COMET materials enliven classrooms and exam rooms which are all wirelessly connected. If you visit the campus, do take advantage of any opportunity to tour the new Medical Education Center, with rooms designed to accommodate various activities, including streaming of video from the Operating Room and from sites off-campus. Teaching of clinical skills takes place in an adjacent, compact cluster of twelve exam rooms equipped with video monitoring.

Lectures comprise only part of the week. Students “Doctor in Vermont” weekly for a year to practice, thanks to the use of standardized patients. Even the standardization of patients grade the students. Local doctors who welcome students every week to their offices also grade them. Gradually students are expected to examine patients more thoroughly, to present them in more detail, and to discuss diagnosis and management with more sophistication. Students grade the faculty regularly too. Today’s national board exams have grown more complex, intrusive, and daunting. (See www.usmle.org to learn more.) But what a sumptuous banquet is laid before today’s students! All the fundamentals are still taught, but taught better, in our opinion. It is less like college, where miscellaneous courses are taken simultaneously. Truly integrated, courses now connect to each other. Each week the content is woven together as beautifully as a capillary network.

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CLERKSHIP

(Clinical Science Core)

BASIC SCIENCE CORE FOUNDATIONS Systems Integration Convergence

CLERKSHIP

ADVANCED INTEGRATION

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Now this material has attained legitimacy as a consistent activity throughout Foundations. Finally, the curriculum section called Convergence is structured to refine problem-solving and differential diagnosis.

Next comes the year of clerkships. This was a familiar territory: required rotations on Surgery, Ob-Gyn, Internal Medicine, Neurology, Psychiatry, Pediatrics, and Family Practice. Now though, even before they start, students have considerably more experience examining patients and presenting findings than we did as we began our clerkships. The clerkships are now linked differently, too. Surgery pairs with Ob-Gyn, for example, to emphasize connections between those disciplines. Teaching of basic surgical skills can then be shared, enhancing the experience for both students and faculty. The students retain access to the computerized curriculum materials throughout clerkships. In fact, even after graduation those materials remain available to them electronically.

One embellishment of clerkships is called Bridges. These are days when students leave the wards to review pertinent topics. For example, those on the pediatrics, family practice, and outpatient medicine rotations meet to consider eating disorders, with their metabolic havoc and family impact. Those on neurology, psychiatry and inpatient medicine review delirium and dementia. The Bridge mandate is to treat a topic from multiple perspectives. With fresh clinical experience to share, students reconsider pertinent basic science and practical management. They’ll consider economics, epidemiology, and end-of-life issues, reinforcing that routine care is built on the armature of basic science and that disciplines overlap and buttress each other.

What we knew as “senior major” in the 1967 cur-
The best ideas from the 1967 curriculum were adapted for the VIC. Each curriculum in its time addressed changing national trends in medical practice and in education. Obviously, this effort required enormous collaboration. It was supported in part by a million dollars of grant money over six years. Students, faculty, and community members took part, as did all our deans. We remain indebted to Diane Magrane, M.D., associate dean for medical education from 1996 to 2002, who, along with many other hard-working people, launched the project.

Building this curriculum was one thing. Running it now is another. We couldn’t help but be struck by the effort involved. So many departments collaborated! But both faculty and students seem to be having more fun. Content is so varied that no two days are the same. Watching the faculty for a whole week is like watching a meteor shower: a sudden burst of gleaming light appears and another follows quickly after that. Their collaboration reveals the College to be a thrillingly interdependent and complex organism, a metaphor for the human beings we aspire to understand.

We’re grateful to the collective Scheherazade’s who designed the curriculum. We become ensnared, wanting more. Generously, the curriculum repeats and amplifies information. Out in practice too, we feel everything goes by too fast. We catch only a glimpse but never enough. What we see and hear every day as physicians is astonishing. It keeps us coming back for more. In this way, the new curriculum prefigures beautifully what’s ahead for students.

Dr. Andrews and a standardized patient during an abdominal exam session in the Student Assessment Center. (right) Dr. Gallagher uses a COMET module.

OUR NEAR-DEATH EXPERIENCE 100 YEARS AGO

If only Henry Tinkham could see the Vermont Integrated Curriculum. He was the feisty dean of the College of Medicine from 1888 to 1925. Without him, there might not be a College of Medicine today at all.

Early on Dean Tinkham had urgent problems. The fire that burned down the headquarters of the school in 1903 was the least of them. After the fire, enrollment declined. Since tuition didn’t cover expenses, faculty salaries dropped. Meanwhile a relatively young American Medical Association was pushing for reform of medical education and even beginning inspections of the schools. The Association of American Medical Colleges was wielding its clout. Individual states established requirements too, including insisting that medical school applicants first attend at least one year of college. It was rare to find Vermont students who had even completed four years of high school! This threatened to decrease enrollment even further. Dean Tinkham eventually formed alliances with the University and state legislators in order to stay afloat financially. He was a formidable lobbyist, strenuously objecting that new regulations placed an inordinate burden on small rural schools. Meanwhile he went about improving the facilities and staffing.

The practice of medicine then was anarchic. Reformists proposed a survey of the state of American medical education. In 1908 Abraham Flexner was hired by the Carnegie Foundation to survey all 155 medical schools. He took a dim view of Vermont, pointing out that the school had “low standards,” only one full-time teacher, no library, no museum, and practically no teaching charts or models. Being too far from big cities, it couldn’t provide enough clinical cases. It had no endowment. Flexner saw the College as beyond repair. Besides he said, there were too many doctors in New England and Harvard and Yale supplied more than enough. Bowdoin, Dartmouth, and Vermont were old schools, but not adequate schools. His recommendation? At most they should be two-year pre-clinical programs.

Bowdoin did fold. Dartmouth resigned itself to being a two-year school, remaining so until 1973. But in Burlington, fearless Henry Tinkham had no intention of giving up. Even when AMA site visitors drew the same conclusions Flexner had, the Dean simply pressed on. He increased the number of full-time faculty (to five), and collaborated regionally to make more patients available for students. He endured one year when only six students met admission requirements. He traveled and pleaded for second chances of all kinds while building the College’s resources to a respectable level.

By 1921, he could finally devote time to refining the curriculum. He reportedly forced scientific and clinical professors to consider the relationships between their disciplines “for the first time.” Faculty meetings became case conferences where professors were made to discuss a case together. He knew he was on to something when he later heard that same idea proposed at national conferences. He embraced another trend developing then: introducing clinical work into the curriculum as early as the first and second years of medical school.

Henry Tinkham’s fight for the medical school was fierce. His vision of what the College could become is embodied in today’s curriculum. We believe he would see this integrated curriculum as fundamentally sound and quite to his liking.

Ellen Andrews, M.D. ’75, is a retired neurologist who lives in North Carolina. James Gallagher, M.D. ’75, was associated with the Geisinger Clinic for many years and lives in central Pennsylvania.