SPECIAL FEATURE
School of Medicine Basic Scientists Share Their Views on Integrated Medical School Curriculum

How to best integrate basic science and clinical teaching in the undergraduate medical school curriculum has been debated for many years, and according to researchers Robin Hopkins and colleagues,¹ the discussions have led to “incremental change but no meaningful transformation.” They contend this is due, in part, to a lack of focus on the basic science educators, whose roles changed significantly with the implementation of integrated, centrally-managed curricula.

More than a decade ago, the University of Colorado School of Medicine (SOM) began transforming its curriculum for undergraduate medical education, in an effort to expose students to clinical practice earlier in their education and to better integrate basic science and clinical learning. Importantly, the SOM also shifted from department-managed courses to central oversight of the curriculum, as mandated by the Liaison Committee on Medical Education (LCME).

SOM basic science professors Randall Holmes, Angie Ribera and Wendy Macklin met recently to discuss how the change in curriculum has impacted their departments. Drs. Macklin and Ribera are current chairs of the Departments of Cell and Developmental Biology and Physiology and Biophysics, respectively. Dr. Holmes recently stepped down as chair of Microbiology.

“Integration is a laudable goal to demonstrate the clinical relevance of basic science throughout the curriculum,” says Dr. Holmes. “But at the same time, there are consequences and challenges.”

Lack of Ownership and Dissatisfaction

According to Drs. Holmes, Macklin and Ribera, many basic science professors share several concerns. One is that collaboration and communication between the core course directors and the basic science departments is sub-optimal.

The current structure has a basic science and clinical science co-director and the courses are inter-departmental in nature with speakers from a variety of departments and professions. In the past, the basic science departments each had ownership of basic science courses. “Each basic science lecture was followed by a clinical correlate. It required collaboration between clinicians and basic science in the development of courses,” says Dr. Ribera. “This collaboration no longer uniformly occurs at the session level. And the (basic science) information we present has become, in my opinion, too condensed.”

“We are now teachers in courses in which we have no authority,” says Dr. Holmes, reiterating how basic science chairs and their faculty members used to participate actively in the development, review and modification of courses and course content, in direct collaboration with their clinical colleagues. Basic scientists were encouraged to be part of the ongoing process—and be heavily involved as teachers to medical students. “Now, as an individual basic science faculty member, you’re often not involved with what comes before or after your particular lecture. It’s not the same as being actively involved in structuring, assessing and revising the curriculum in an ongoing manner.”

Furthermore, they have observed a variable level of investment from course co-directors and instructors in the engagement of both lecturers and department chairs, speculating that instructors are not incentivized or held accountable to know what happens before or after their lecture. There is little repercussion for giving a bad lecture or one that doesn’t tie in well with corresponding lectures. When basic science departments had more course ownership, there was a more clear mechanism for feedback and evaluation.

“Basic science faculty don’t know where their assigned lectures fit into the course as a whole. Many in the basic science faculty don’t feel connected, to the students or the curriculum,” says Dr. Macklin.

This lack of participation and authority in curriculum development has led to dissatisfaction throughout the basic science departments at the SOM.

Dr. Macklin believes the curriculum changes have been depressing to basic scientists, as the changes have reduced their sense of value within the university. She adds that her department is unique among the basic science departments, as they have retained ownership of the human body block. “It’s an incredible source of pride for our faculty.”

Even the department chairs feel disconnected from the current curriculum and the faculty they are tasked to oversee. “Because block directors often contact faculty directly, I don’t even have any control over who in my department is lecturing,” says Dr. Macklin.
Inconsistency within departments is also an issue. “It’s not really mandated how much people have to teach,” says Dr. Ribera. “Some departments participate in the curriculum more than others.”

**The Impact on Students**

Basic science faculty also share concerns that students—who come to the SOM with varying baseline knowledge in the sciences—don’t have a consistent appreciation of the role science plays in clinical practice.

“The decrease in basic science content and the increase in clinical content within phases I and II of our integrated curriculum may send a message to some students, even if unintentional, that the science of medicine is relatively unimportant for the practice of medicine” says Dr. Holmes. “I think physicians need to be consistently trained in evaluating evidence and dealing with the scientific aspects of medicine in a rational way.”

Drs. Holmes, Macklin and Ribera also point out that basic science training gives a student and, later, a physician, a structure for making critical assessments and observations. Dr. Ribera says, “We can train people to treat disease today, but without a strong foundation in the basic sciences they may not understand the newer discoveries and new mechanisms that will help treat disease in the future.”

Dr. Macklin agrees that basic sciences knowledge is essential, and she has observed that “students are being exposed to a reasonable amount of basic science. But by the time students get through their clinical years, they don’t always keep the knowledge.” Dr. Macklin adds that this issue could be addressed during the clinical years by providing short reviews of the underlying science.

**Shifting the Culture**

Dr. Holmes thinks SOM students would benefit from a shift in the culture surrounding our curriculum. “There needs to be a better balance between the messages we convey about the importance of basic and clinical sciences across our integrated curriculum. In my view, we have been much more successful in introducing clinical content into phases I and II than we have been in sustaining basic science content throughout phases III and IV.”

**Disincentives to Teaching**

Basic science department faculty often play a much bigger role in graduate school basic science PhD programs and may derive far more satisfaction from this cohort of students. Dr. Macklin explains that much of this is because these are the students who are interested in basic science. “Our faculty are excited about what they do, and there’s a sense of pride in teaching those concepts. You get more feedback from your graduate students than in undergraduate medical education settings.”

“Basic science faculty members are used to teaching at the graduate level—our reduced role in UME means we’re not used to teaching medical students. So some instructors fail to appreciate the typical knowledge base of students in their medical classes, and they may sometimes teach above the most
appropriate level,” says Dr. Holmes. “This can contribute to a lack of student engagement in the basic science material.”

These basic sciences chairs also worry that faculty are no longer sufficiently incentivized to improve their teaching skills. This comes from decreased contact with medical students and from lack of ownership of, and meaningful engagement in, the undergraduate medical curriculum.

Dr. Macklin believes there’s a sense of irony surrounding the role basic scientists play in the academic medicine setting. She points out that teaching is the reason the university exists, but the culture and structure are such that it doesn’t seem as if basic science teaching is actually valued.

Dr. Ribera says basic science faculty can actually feel incentivized to do the bare minimum in terms of curriculum. “As faculty feel less ownership and less valued in their roles as educators, and feel more pressure financially to maximize their research capabilities, where is the incentive to be good teachers? On a departmental level, where is the strong incentive to recruit top basic sciences educators?”

Dr. Holmes has also observed that, for basic scientists, promotion now depends primarily (although not exclusively) on research productivity; there is often no direct pathway to promotion to full professor for the master educator.

Although Dr. Ribera began teaching when basic science departments had more control of the curriculum, teaching was still difficult. “I didn’t enjoy teaching until I felt more secure in my position at the university and felt I could relax and focus more on my role as an educator.”

**Motivation for the Basic Scientist Teacher**

Despite their changing and progressively more limited roles in the integrated medical curriculum, many basic scientists still manage to find rewards and satisfaction from being instructors.

“If you’re involved in teaching, it’s because you believe it’s important,” says Dr. Ribera.

The students are still a primary source of motivation. “They are bright, highly motivated individuals doing their best to master the material within the time constraints of their lives,” says Dr. Holmes, who enjoys the time he is able to spend teaching in small groups. “You see then that they are thoughtful students with good questions. When you get to know them at that level, teaching is much more rewarding.”

**The Future of Undergraduate Medical Education**

Drs. Holmes, Ribera and Macklin are well-aware that student attendance during basic science lectures is very low. This has fed much of the talk about turning basic science teaching over to MOOCs. But Dr. Macklin points out that there are few studies assessing learning outcomes when an entire curriculum is moved online. Furthermore, even during lecture-based courses where attendance is poor, “students still
have access to a professor, and this has considerable value.” Dr. Macklin hesitates to predict that MOOCs will eventually take over, or that they are the wave of the future.

As the SOM continues to refine its medical curriculum, it is clear there needs to be more thought given to the role of basic science departments in undergraduate medical education.

“The School of Medicine has strong basic science departments, with interested and committed faculty,” says Dr. Macklin.

Indeed, basic sciences teaching remains strong. But there's an opportunity to do even better. As a school, we need to improve communication between course co-directors and the basic sciences departments, more effectively engage the basic sciences faculty in curriculum planning and delivery, and develop better methods to support, recognize and reward basic sciences faculty members, including our master teachers, for their important contributions to medical education.

Carol Rumack, MD Receives Elizabeth Gee Memorial Lectureship Award

Dr. Rumack, professor of radiology-diagnostics, was honored as a “pioneering woman” at the CU Women Succeeding Professional Development Symposium, where she was presented with The Elizabeth D. Gee Memorial Lectureship Award. The award recognizes and honors an outstanding faculty member of the University of Colorado for efforts to advance women in academia, interdisciplinary scholarly contributions and distinguished teaching.

Recommended Reading:
Seeking a System that Treats Us All Humanely

“Creating a culture of respect is not just about feeling good, for its own sake. It’s better for patient care.”

Read more.

Recommended Reading:
Physician Burnout: What to Do When Working Harder Isn’t Working

“The first step-by-step manual for any physician in any specialty to stop physician burnout, build a more ideal practice and a more balanced life.”

Read more.

TEACHING TIPS

Top 10 Clinical Teaching Pearls

By Mel L. Anderson, MD, FACP
1. **Set the stage** – Meet with your trainees to discuss goals, objectives, expectations, learning climate, and how teaching and patient care will work. Take advantage of this time to introduce yourself, team members, and to begin the process of team building.

2. **Plan your feedback** – Set times at the start of a rotation for feedback sessions. Establishing the feedback expectations lets learners know you value it. Have learners fill out one side of a note card with their name and a list of things they want to learn. Use the back to write specific observations about their performance as the days go by—strive for timely, specific, respectful and actionable feedback.

3. **Teach to the gap** – Let your learners know you will engage in questioning in order to best deliver relevant and useful teaching—but never to shame or humiliate. Watch the nonverbal communication of your learners to know when to add hints, when to normalize (e.g., “this is tough stuff”), and when to provide your own positive nonverbal communication as encouragement. Top tier teaching relates to the extent by which you create a safe and effective learning climate where your learners feel they have the latitude to ask questions, reveal what they don’t know, think out loud and even struggle without fear of retribution.

4. **Mind your nonverbals** – As you ask questions, take care to not “telegraph” the expected answer through nonverbal communication, like gently shaking your head “no” or nodding your head “yes.” You can prepare your learners, who often have gained experience in being able to read nonverbal communication in previous teachers, that you intentionally plan to **not** provide nonverbal clues, but for an educational purpose: so that they can complete their thoughts independently.

5. **Not what you’re thinking, what they’re thinking** – Effectively phrasing questions is an art. Try to avoid “guess what I’m thinking” questions. Instead of asking “what are the most important things we need to do for this patient,” try “what do you think the most important things are that we need to do for this patient.” You want them to share their clinical reasoning in a way that allows you to assess, correct, add or embellish and praise.

6. **Go to the bedside** – Independent of teaching setting, the educational literature consistently shows that patients prefer being present for the presentation and discussion and that the overall time spent is no different. Teachers and learners can efficiently layer simultaneous activities by going bedside: confirming correct clinical information to guide patient care, observing learner skills, and teaching the patient and other team members.

7. **Be a model** – Demonstrate your compassion, professionalism, and communication skills with patients in the presence of learners. How you interact and speak with patients may provide some of the most memorable experiences for your learners, in both positive and potentially negative ways. Remain vigilant about your own emotional responses in the clinical setting in order to best care for patients and best provide an example for doing so.

8. **Lifelong learners, one and all** – If you don’t know the answer, just say so. Learners will appreciate the candor.

9. **Coaching is good** – Seek out great teachers and ask to tag along on a teaching excursion. Ask them to do the same for you. Apply lifelong learning principles to your teaching practice.
10. **Dare to observe** – Make plans to watch your learners in action: interviewing and examining patients, communicating with families or specialists, and interacting with peers. These observations can be a rich source of feedback on clinical skills, communication and professionalism.

**FAQs**

*What is the Teacher-Learner Agreement?*

- The TLA is a mutual pledge between teachers and students about their shared obligations in teaching, learning, research and clinical care.
- The TLA is also a reminder that duty, integrity and respect are values of fundamental importance to medical education.

*What are some of the things it says that teachers should do?*

- Treat students fairly, respectfully and without bias related to age, race, ethnicity, gender, sexual orientation, religion, spiritual or political beliefs, disability or country of origin;
- Maintain high professional standards in all interactions with patients, students, colleagues and staff;
- Practice insightful (Socratic) questioning, which stimulates learning and self-discovery and avoid overly aggressive questioning which may be perceived as hurtful, humiliating, degrading or punitive.

The TLA lists additional responsibilities, which include providing explicit learning expectations, timely and constructive feedback and thoughtful and timely evaluations. Teachers are also expected to disclose to students, during lectures, seminars and mentored research activities, the existence of any financial ties or conflicts-of-interest that are related to the material being taught.

Teachers should also be familiar with the processes and resources of the Student Honor Council and the Student Professionalism Committee. Faculty should utilize appropriate mechanisms to encourage students who experience mistreatment or who witness unprofessional behavior to report the facts immediately (for example, to the Office of Professionalism, a trusted faculty or staff member, or the online professionalism reporting system) and to treat all such reports as confidential.

*What do students have to do?*

- Treat teachers and fellow students fairly, respectfully and without bias related to age, race, ethnicity, gender, sexual orientation, religion, spiritual or political beliefs, disability or country of origin.
- Demonstrate professional behavior in all settings.
- Be active, enthusiastic, curious learners who work to enhance a positive learning environment.
The TLA lists additional responsibilities for students, including: recognizing personal limitations and seeking help when needed; providing teachers and the SOM with constructive feedback; and recognizing that not all learning stems from formal and structured activities. Students are also expected to demonstrate a commitment to life-long learning, uphold the honor code and be familiar with mechanisms to report exemplary professionalism and professionalism lapses.

What else does the Teacher-Learner Agreement say?

- Students and teachers must avoid any and all behaviors that conceivably could lead to the perception of a boundaries violation such as:
  - Romantic involvements;
  - Business relationships, other than those that might emerge from joint educational projects;
  - Faculty or students accepting services or personal favors from each other (for example, babysitting, house sitting, pet care or work in the office);
  - Accepting substantial gifts;
  - Special treatment of a student, including gifts, meals, entertainment or social contacts, that differs substantially from the usual teacher-learner relationship with other students;
- Students and teachers should avoid the potential conflict of interest whereby a student’s healthcare provider is also evaluating a student’s academic or clinical performance in a teaching role.

Does this mean I can’t have lunch with a medical student or invite students to my house for dinner?

No, but you have to use good judgment to maintain appropriate boundaries. There are no hard and fast rules, but here are some red flags that may indicate possible boundary violations:

- Repeated social contacts with one student;
- Social contacts that are not related to mentorship, teaching or learning;
- Social contacts that would not be arranged with other students;
- Contacts that feature alcohol as a central activity;
- Contacts that are more for you than for the student;
- Social contacts that are starting to feel like dating.

Where can I find the Teacher-Learner Agreement?

The TLA is posted on the Faculty Professionalism website. Faculty members must also acknowledge their understanding of the TLA annually, as one of the final steps in the PRISM performance review process. If you have questions or concerns about the TLA, you may contact Wendy Madigosky, Maureen Garrity or Steven Lowenstein.
Curriculum Mapping Project Meets Major Milestone Because of Director of Curriculum Michele Doucette

What happens when you inventory 37 program competencies, 450 course goals, 7,843 learning objectives and 3,913 unique MeSH terms?

You get a detailed map of the core curriculum offered by the University of Colorado School of Medicine (SOM).

Michele M. Doucette, PhD and her team have been working with students, faculty, course directors and deans to collect, assess and validate all elements of the SOM’s core curriculum.

The mapping project began in April 2014, when Doucette stepped into the role of Director of Curriculum, Undergraduate Medical Education. By October 31, 2014, the team hit a major milestone: The SOM curriculum was mapped according to the Association of American Medical Colleges (AAMC) Curriculum Inventory and Reports requirements and uploaded into the AAMC Curriculum Inventory database. This centralized resource is the premier benchmarking and reporting tool on content, structure, delivery and assessment of medical school curricula.

Doucette says the milestone was met thanks to the help of many on campus. “It took a village,” says Doucette. “From medical students and faculty to course directors and assistant deans, so many people were totally engaged in this. And the work of the nine curriculum team coordinators was invaluable.”

“I am so impressed by how engaged the faculty are in supporting the curriculum mapping project. There have been very few barriers to accomplishing what we need to accomplish. It took everyone being on board in a short period of time. It’s an accomplishment.”

The impetus for the project came from the AAMC’s Medical Academic Performance Services, a program that helps medical schools assess their achievement of education and accreditation standards. It’s likely that curriculum maps will become a requirement for medical school accreditation in the near future.

Doucette believes faculty and students alike will see benefits from this project. Faculty will be able to log in and see where a course fits within the overall medical school curriculum. It will aid with course evaluation and design, as well as provide a resource for curriculum redesign.

“We’ll be able to see how we’re meeting the needs of our students, and find gaps and redundancies in the education our students receive,” says Doucette.

Currently, Doucette can run detailed reports for faculty members, but as soon as next year she expects faculty to be able to run reports themselves.
In the next few years, students will benefit from curriculum mapping in a variety of ways. Through an interactive user interface, students will be able to search by keyword, allowing them to “at-a-glance” know when they were taught or when to expect to learn about certain topics. All the information will be connected to student grades, coursework, and interactive student learning portfolios.

“Our hope, as our abilities advance, is to eventually be able to map our curriculum to long-term student data—following them into residency and careers so we’re able to assess the effectiveness of our program,” says Doucette.

Although Doucette has helped the SOM reach its first milestone of the project, she’s not one to rest on her laurels. “This is an ongoing process—this will never stop,” says Doucette. “We will keep reviewing and updating and validating—it’s a never ending process.”

Doucette is thrilled to be working within the Undergraduate Medical Education office. “This entire group is fantastic. Everyone cares so much about our students and, making their education the best it can be.”

As for all that data, Doucette admits it’s something she’s well-suited for. “This is my dream job,” she says. “Before I got my PhD, I was a systems engineer. I’m used to putting pieces together and making them work effectively.”

**LINKS TO ARTICLES ABOUT ACADEMIC MEDICINE**


- Academic Institutions and One Health: Building Capacity for Transdisciplinary Research Approaches to Address Complex Health Issues at the Animal-Human-Ecosystem Interface
- Correlation Between Trainee Candidate Selection Criteria and Subsequent Performance
- Integrating Basic Science Without Integrating Basic Scientists: Reconsidering the Place of Individual Teachers in Curriculum Reform
- Linking Simulation-Based Educational Assessments and Patient-Related Outcomes: A Systematic Review and Meta-Analysis
- Perceptions of Division Directors in General Internal Medicine About the Importance of and Support for Scholarly Work Done by Clinician-Educators
- Performance in Physical Examination on the USMLE Step 2 Clinical Skills Examination
- Predicting Academic Performance in Surgical Training
• Should MD–PhD Programs Encourage Graduate Training in Disciplines Beyond Conventional Biomedical or Clinical Sciences?

• The Impact of Stigma and Personal Experiences on the Help-Seeking Behaviors of Medical Students With Burnout

• The Majority of Accredited Continuing Professional Development Activities Do Not Target Clinical Behavior Change

• What Does Remediation and Probation Status Mean? A Survey of Emergency Medicine Residency Program Directors

EVENTS

Unless otherwise indicated, register at http://somapps.ucdenver.edu/facultyaffairs/faculty/

Fostering Reflective Capacity with Interactive Reflective Writing
April 28, 2015
2 p.m. to 4:30 p.m.
Hedy Wald, PhD
Nighthorse Campbell - Shore Family Forum