PROCESS OF CURRICULUM REDESIGN

Timeframe

Duke undertook a well-publicized major curriculum reform in the 1960-1970’s (Wyngaarden Bull NY Acad Med 1973) in which they transitioned from a traditional curriculum to their distinctive one-year basic science curriculum in which the years are structured as follows:

1. Basic science
2. Clinical electives
3. Research in a basic science lab (or, more recently, research in clinical topics or a master’s program)
4. Clinical electives

From 2002-2004, they achieved another major curriculum redesign (Buckley and Growchowski Acad Med 2010). Keeping the above structure, they achieved the following:

1. Integration of basic and clinical sciences in first year in non-departmentally organized topical modules called the Foundation for Excellence curriculum.
2. Shift from primarily lecture-based first year content to one that was at least on third small group and interactive.
3. Incorporation into the first three years of “Practice Courses” that build clinical skills, ethics, integrative medicine and other topics that had not been delivered in the previous curriculum.

Curriculum committees worked for a year then had two-day retreat for final decision-making.

Thus, it took two years to revise the basic science curriculum entirely and to add longitudinal integrative small group sessions into three of the four years. They made all changes at once instead of running two separate curriculums.

Lessons learned

Buckely and Growchowski et al discuss in Acad Med 2007 early difficulties with anatomy curriculum. What worked in the end was a highly directed dissection schedule that was strongly tied to clinical learning needs, but this was only achieved through multiple iterations.

Obstacles to the Foundation for Excellence curriculum transition included basic science faculty wanting more time for their pet projects, and not understanding why the curriculum needed to change given the demonstrably high achievement of their graduates.
To address faculty balkanization and wanting to hold onto their traditional lecture-based format and time allotments, they did a lot of politicking but also invited all major course directors to a Saturday morning retreat. The retreat was structured creatively: curriculum redesign leaders posed "key questions" predicated on values they’d articulated in redesign process and then asked participants to discuss then finalize decisions on curriculum structure and content using an audience response system so that the process was “not overwhelmed by strong personalities.” They felt this improved buy in for resolutions of the group. Another way of moving focus of curriculum on the basic science departments was to move funding for teaching out of the departments and have the medical school’s curriculum office provide funding for teachers using a funding model that mirrored the curriculum delivery model.

**GENERAL FRAMEWORK (BASIC STRUCTURE)**

**THE DUKE CURRICULUM: FOUNDATION FOR EXCELLENCE**

**Approaches to integration**

The first year Foundation for Excellence curriculum was designed to integrate basic and clinical sciences. It is described in Growchowski et al. *Acad Med* 2007

- Interprofessional Introduction to Prevention (attended together by students of medicine, physician assistant, and physical therapy) - 16-hour course
- Molecules and Cells (integration of Biochemistry, Genetics, and Cell Biology) – 6.5 weeks
• Normal Body (integration of Gross Anatomy, Micro Anatomy, Physiology) - 12.5 weeks
• Brain and Behavior (integration of neurobiology and Human Behavior) - 4 weeks
• Body and Disease (integration of Microbiology, Immunology, Pathology, and Pharmacology) – 20 weeks
• Practice – Doctor/patient relationships, interviewing, physical exam, basic counseling skills (4 hours/week for entire year)

Courses were developed in an iterative fashion. First, after taking funding for courses about of basic science department, they funded course directors to meet and bring together content. At first, the draft curriculum that came out of these meetings “looked like a puzzle,” i.e. a new general format comprised entirely of lectures or other sessions lifted directly from the old curriculum. Then, when curriculum redesign leaders encouraged participants to seek areas for synergy and integration, the model took new shape and those old structures entirely faded away, being replaced by a whole new integrated curriculum with few topics taught in the old way.

Method of curriculum redesign

The larger redesign committee was formed via key teachers e.g. course directors and award winners. Associate dean for curriculum “didn’t have a dog in the race,” i.e. a pet course to protect, which was important because he could be an unbiased observer. Then, as discussed in the integration session, some of the teams formed in the redesign process were maintained indefinitely to allow for ongoing continuation of integration as well as innovation.

Physical exam teaching

Practice course starts from beginning of medical school, and includes among other things physical exam teaching using simulation, classmates and actors.

INTEGRATION (HORIZONTAL & LONGITUDINAL)

Basic science integration into clinical clerkships

Basic sciences are not specifically integrated into clinical clerkships. Although clerkships have modules for skills building (communications for instance in geriatrics, surgical skills in Ob/Gyn and surgery) the shape of the clerkships is fairly traditional.

Despite the traditional clinical clerkship structure of the later years of the curriculum, the Duke curriculum uses innovative means of delivering complementary content. The same group of course directors that structured the revised curriculum continue to meet monthly to keep integration going and to look for new ways of introducing innovation. An example here is the team-based teaching format such as was originally introduced by geriatrics course but now promulgated to other courses. Also, to help course directors integrate, they have a web site that not only diagrams all course content but also provides PowerPoint slides for student and faculty review. This allows new teachers and innovators know what’s already being done.
LONGITUDINAL CLINICAL EXPERIENCE

Longitudinal mentorship

Yes. The Practice Course sessions that run weekly through the first three years are run by primarily clinician mentors who not only assist with skills building like physical exam, interview skills, etc, but also provide time for students to discuss in a non-threatening context things like experiences they’ve had in clinic or the wards. They’re moving toward a model that systematically “fills in the gaps” i.e. lets students who’ve seen something unusual educate other students about it such that all students’ experiences are as broad as possible. Practically, the Practice Course mentor is the same for each full year. 15 minute didactic intro then split into small groups. Group leaders are all clinicians, but not all are primary care providers.

Timing of patient care experiences

Clinical exposure begins in second year, full time. The first year Practice Course I, which provides clinical content from the first week, does not involve hands-on clinical teaching.

Team-teaching

Geriatrics has senior student mentorship program, described in Hefflin Gerontol Geriatr Educ. 2006. This approach is not universal applied yet but on its success the school is moving toward team-based teaching in multiple specialties.

STUDENT INDIVIDUALIZATION

Boot camp

Molecules and Cells – the first course of the first year – is partly designed to get all students up to speed, with students pre-med school exposure to that material being most diverse. Students’ exposure to the material in the second module, “The Normal Body,” is by contrast relatively uniform and relatively slight.

In addition, the first course of the second year, called Introduction to the Clinical Year, is a clinical boot camp, teaching people about presentation skills, notes, labs, etc.

No individualization of progress through curriculum

Students progress through the Duke Med curriculum at the same speed.

Does your curriculum give students the opportunity to individualize their experience either through specific tracks of study, master's or other mechanisms?

The third year provides for nearly infinite individualization (Laskowitz Acad Med 2010). Around eighty percent of students engage in some form of intensive research, either in basic science labs or through clinical research experiences. The other twenty percent use the third year to pursue a master’s program. Options for which students are granted third year credit are:
MD/PhD (Medical Scientist Training Program)
MD/MBA (Masters in Business Administration)
MD/MPH (Masters in Public Health)
MD/MPP (Masters in Public Policy)
MD/JD (Juris Doctor)
MD/MSLS (Medical Science in Library Science) or MD/MSIS (Master Science in Information Science)
MD/MA/PSYC (Masters in Clinical Psychology)
MD/CRTP (Master of Health Sciences in Clinical Research Training Program)
MD/PhD (Medical Historian)

CURRICULUM CONTENT

Curriculum in issues like insurance, the regulatory environment, socioeconomic factors, family factors, etc.

Practice courses II and III contain that material, woven into small group sessions with input from students in different practice settings.

Procedural skills teaching

Both surgery and ob-gyn have hands-on workshops on procedures, e.g. practice tying sutures, pig lab and other approaches.

Ethics material

Practice Course II contains ethics material.

Research and individual scholarship

In the third year, scholarship with designated mentorship is required, although as above the forms this takes are very flexible and nearly entirely student directed.

Competency-driven curriculum

Everybody progresses at same speed.

METHODS

Mix of lectures and other teaching formats

Acad Med 2010 35% lectures in first year, 30% unstructured, 30% small group/active learning, 5% assessment – how accomplish transition?

Uses of technology for teaching

Pediatric clerkship uses computer-assisted learning as foundation of curriculum.

Lectures streamed online from 1 hr after offered such that only 1/3 of class comes to non-small group sessions. Students do watch, esp at NUS. Can run at 2x, allows rewind, and then might not need to be re-taught next year.
Those sessions predicated on advanced reading, and therefore more contextual.

**FACULTY DEVELOPMENT**

**Funding for clinician teachers**

The Medicine clerkship and the Pediatrics clerkship have clinical skills trainers—physicians who provide focused instruction on physical examination and diagnosis skills.

From Buckley and Growchowski *Acad Med* 2010:

“Financial Management of Educational Program

- The curriculum management system is used to track faculty teaching time and associated preparation time, referred to as educational relative value units (eRVUs).

- Allocations from the Dean’s office to department chairs for educational effort are based on their faculty members’ eRVUs.

- The Office of Curriculum has a separate operating budget that is funded through the Office of the Vice Dean for Education.

Valuing Teaching

- Medical student teaching is rewarded in the promotion and tenure process, and the School of Medicine has two tracks for educators:

  • Track 1: a tenure track for clinician educators

  • Track 4: a non-tenure track for education professionals

- Allocations based on teaching effort are distributed to departments on an annual basis (see above).”

Medical student awards for teachers

Three major types of supported clinical faculty, with funds that come directly from tuition:

1. Each of major clinical areas has funded clerkship director, ~$40,000 each + financed assistant.

2. Folks who contribute on routine basis to educational effort e.g. in Practice Course.

3. Clinical electives. $100/day/student

When revenue stream came from Dean to clinical departments, was not connected to specific individuals and sounds like output was diffuse and lacked accountability so they
eliminated middleman. He’s moving toward a quarterly system that allows really strong accountability.

**OTHER**

**Admissions**

Biochemistry is a prerequisite.