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Proposal for a New Quillen College of Medicine Curriculum: First Report of the Curriculum Revision Working Group

Members: Ken Olive, MD	Internal Medicine/Academic Affairs
Dave Johnson, PhD	Biochemistry
Ramsey McGowen, PhD	Psychiatry and Behavioral Sciences
Jerry Mullersman, MD, PhD	Pathology
Brian Rowe, PhD	Physiology
Chris Cropsey	4 th year medical student
Forrest Lang, MD	Family Medicine
David Linville, MD	Academic Affairs/Dean's Office
Penny Smith, EdD	Academic Affairs
Lisa Myers	Academic Affairs (admin support)

The Quillen College of Medicine curriculum has gradually evolved over time but has generally maintained a structure of department and discipline based basic science courses in the first two years in a relatively traditional sequence. This curriculum has served us well. Overall our graduates perform at the national average on licensing exams. They are successful in being selected for residency programs, and they become successful physicians.

However, medicine is a rapidly evolving field and in many ways our curriculum has not kept pace with these changes. As scientific knowledge has advanced we have often added information to the curriculum without revisiting the relevance of other material. As a result our curriculum has become more fact filled and dense with some material of questionable relevance to future physicians. Societal changes have created new ethical issues, changed mechanisms of health care delivery, altered the medical work force, and modified health care financing. Our curriculum has not kept pace in addressing many such issues.

The National Board of Medical Examiners is updating the USMLE to move from its traditional three stage examination procedure to a two stage procedure to examine physicians to determine fitness to begin practice at two points in their careers: 1) the supervised practice of medicine (residency) and 2) the transition to the unsupervised practice of medicine (practice). As part of this process the NBME has indicated its intention to increase the attention to ethical and social issues in its examination process.

In June 2007, Dr. Bagnell charged the Medical Student Education Committee to examine the QCOM curriculum and to reduce the basic science content by 25% in order to expand clinically related content. For the past year the curriculum revision working group has been actively examining the first two years of the curriculum by carefully appraising each course in detail, by reviewing the medical education literature and by studying a variety of models from other institutions currently implementing curriculum revision. This is the first set of recommendations from this group. This set of recommendations addresses only the first two years. Future reports will address the clinical years.

Goals

1. Shift focus toward teaching concepts most relevant to the future practice of medicine
2. Increase integration to help learners appreciate the relationships among the various basic science subjects and between the basic and clinical sciences
3. Further enhance students' abilities to maintain a practice of life-long learning
4. Enhance the curriculum by including important topics currently omitted – especially related to social context

Principles

1. Maintain integrity of basic science content while improving organization of delivery
2. Present material in a logical sequence
3. Recognize the changing learning styles and use of technology by the current generation of students
4. Increase student engagement and knowledge retention by increasing amount of time available for self-directed learning and by increasing number of active learning techniques
5. Alter curriculum to insure students are capable of critically appraising scientific advances and of dealing with the ambiguity faced in clinical practice
6. Provide time for new content by eliminating excessive detail
7. Enhance integration of material in a clinically relevant way
8. Focus first year on normal structure and function
9. Focus second year on abnormal structure, function, and fundamentals of prevention, diagnosis, and treatment
10. Present material in integrated course blocks

Advantages

1. Provides opportunity for comprehensive review of the curriculum and for rebalancing concepts presented in the curriculum
2. Provides opportunity for interdisciplinary faculty interaction and collaboration
3. Provides opportunity to include new content to better prepare students for both practice and for new USMLE testing
4. Increases self-directed learning
5. Increases efficiency of curriculum
6. Reduces competition (for student attention) between courses

Potential Problems

1. Requires faculty to learn new teaching techniques
2. Requires significant administrative and faculty work to reorganize curriculum
3. Require mores clinical and basic science faculty members to serve as small group leaders
4. Presents implementation challenges in that it works outside of current departmental structure
5. Requires significant resources (administrative support and new faculty)
6. Requires faculty members to have a greater awareness of the remainder of the curriculum

Assumptions:

- 20 weeks per semester (including finals)
- Keep Thursdays (first year) and Tuesdays (second year) available for RPCT
- Each of block courses 1-5 will have one basic science and one physician as course co-directors along with a steering committee of faculty with appropriate expertise
- Block 6 will have a full-time clinical course director with appropriate support
- Each organ based subset of block will have a section director with appropriate expertise
- Greater proportion of alternative instructional strategies
- Limit contact hours to allow for more self-directed learning
- Evaluation techniques should be reasonably standardized across the curriculum, should be integrated within a course, and include non-cognitive assessments, e.g. ~50-60% exams, 25% quizzes, 15-25% task completion/non-cognitive

Summary:

Year 1

Introduction to Medicine (1-2 weeks)

Four major basic science blocks interspersed with two clinical blocks

Communications still to be taught spanning the two blocks of the fall semester

Physician, Profession & Society 1 spanning the entire first year

Year 2

One basic science block course

Major course for the year is an integrated organ system course which spans both semesters

A course will be developed to bridge to the clinical years

Physician, Profession & Society 2 course spanning the entire second year

Practice of Medicine runs throughout the year

Orientation – 1 week before semester starts

Year 1

Introduction to Profession

1 vs 2 weeks

Topics such as:

- Professionalism/leadership
- History of Medicine
- Physician roles, identity and functions
- Patient-centered care
- Social and community context of medicine
- Rural practice of medicine
- Basic clinical skills
- Shadowing/health coaching

Block 1 – Cellular & Molecular Medicine 8/9 weeks

- Biochemistry
- Cell biology & physiology
- Molecular genetics
- Case oriented learning activity

Clinical Module

3 days with 2 days for fall break

Block 2 – Human Body – Structure and Development 8/9 weeks

- Gross anatomy
- Embryology
- Introduction to physical examination
- Case oriented learning activity
- Introduction to imaging

Christmas Break

Block 3 – Human Body – Tissue Structure and Function 10/11 weeks
(Duration of block depends on what goes in Block 4 and on whether 1 or 2 clinical weeks)

- Cell & Tissue without basic cell biology covered in Block 1
- Physiology without basic cell physiology covered in Block 1

Clinical module(s)

Preceptorship 1 week

Should there be another separate clinical module?

Block 4 – Pathogens, Immunity & Antimicrobials 8 weeks

Micro/immunology

Note: This will include much of current course content, but those aspects that can be moved to the integrated organ systems course will be presented there.

Introductory principles of pharmacology

Presentation of pharmacokinetics and pharmacodynamics in context of antimicrobial therapy

Communications

Spans Blocks 1 & 2 in the fall

- Similar number of hours as in current course
- Inter-professional
- Skills of patient-centered communication, including in challenging situations (bad news, domestic abuse, depression, end of life, grieving; dealing with errors)
- Communication with other health professionals

Physician, Profession & Society 1

(Alternative title: Patient, Physician and Profession)

Spans the entire first year

Potential Topics:

Leadership

Ethics/professionalism (including topical discussions: neonatal, genetic, research, reproductive, bioterrorism, impairment and collegial responsibility, social justice, etc

Self-care

Prevention (The Healthy Human)

Population health

Behavioral science (other than lifespan)

Cultural issues/global medicine

Health disparities

Complementary and alternative medicine

Professional communication and relationships/teams

Quality Improvement/ reducing medical errors

Gender issues

Chronic disease

1st year Clinical Module

Potential Topics:

- Lifespan development
- Disease that integrates previous module's basic science material
 - Could take a thematic approach to integration
 - e.g., Disease from a lifespan perspective
 - From a cultural perspective
 - From health policy/systems/financing perspective
- Human Sexuality

Summer Break

Year 2

Block 5 – Mind, Brain & Behavior 8 weeks

Current neurosciences course with less focus on clinical neurology (this will be covered in neuro/psych component of Block 6)
Some components of current behavioral sciences course
Pharmacology topics relevant to nervous system including autonomic pharmacology

Block 6 – Mechanisms, Diagnosis & Treatment of Disease

Fully integrated blocks

<u>Content</u>	<u>Topic</u>	<u>Time</u>
Pathology	Genetics	2 wks
Pathophysiology	Rheum/Immuno	2 wks
Pharm & other therapeutics	Endocrine	2 wks
Microbiology	Cardiovasc	3 wks
Laboratory medicine	Respiratory	3 wks
Imaging	Renal/GU	2 wks
Nutrition	GI	2 wks
Behavior & Lifestyle	Neuro/psych	4 wks
	Derm	1 wk
	Reproductive/Sexuality	2 wks
	Hematology/Oncology	<u>3 wks</u>
		26 wks

Block 7 – Transition to 3rd year 4 weeks

Biostatistics & Epidemiology (may be placed earlier depending on content of clinical modules and other courses)

Learn, **IN**tegrate and **C**onsolidate (**LINC**) – focusing on one or a few specific clinical problems, like asthma:

Bench to Bedside – how basic sciences are relevant to the clinical problem

Cycle of Life – how the process manifests and differs across the lifespan

Mind-Body Connection – how psychosocial/behavioral/spiritual factors may impact problem

Metabolic/Nutrition – role these factor play in managing the problem

Clinical boot camp/introduction to 3rd yr

CXR interpretation

ECG interpretation

Practicing clinical procedure

BLS/ACLS

OSCE

Practice of Medicine

Runs through year

- Integration, review and application of basic science pathophysiology
- Introduction to the culture of medicine
- Build on physical exam skills from M1 experience
- Enhance communication skills from M1 experience
- Basic interpretation of EKGs, lab data & diagnostic imaging studies
- Learn to package historical, physical exam & other data
- Learn to formulate a differential diagnosis

Physician, Profession & Society 2

(Alternative title: **Patient, Physician and Profession**)

Spans the entire second year

Potential Topics:

Evidence based medicine

Biostatistics

Epidemiology

End-of-life issues

Palliative care

Health care systems/medical economics

Clinical problem solving (How doctors think: critical reasoning and pitfalls)

Pain management

Introduction to Clerkships

Boundaries

Disruptive/abusive/intimidating behavior

Medical legal issues

Two one-week clinical modules within Block 6

Potential Topics:

- Evidence based medicine
- End-of-life issues
- Clinical problem solving

Cross cutting themes

Some topics do not fit well into the context of a single course but should be taught across the curriculum. These have been described in other institutions as cross-cutting themes. Many subject areas might fit here. We propose several that should be considered at the time of initiating a new curriculum:

- Ethics/Professionalism
- Women's Health
- Geriatrics
- Nutrition
- Genomics
- Cultural competence

See Appendix to follow

Appendix

Some advantages/rationales of revised curriculum:

Introduction to Profession

- help students from a variety of backgrounds to understand context of curriculum
- provide a clearer delineation between medical and undergraduate studies

Cellular & Molecular Basis of Medicine

- position as first basic science course provides critical fundamentals
- biochemistry, cell biology, and molecular genetics should integrate easily
- placement before embryology provides foundation for molecular embryology topics

Human Body - Structure and Development

- placing molecular genetics before embryology simplifies structure of this course
- gross anatomy and embryology should coordinate well with each other
- anatomical aspects of physical examination and imaging complement basic anatomy teaching

Human Body - Tissue Structure and Function

- teaching tissue and organ structure/function together enhancing comprehension
- reduce duplicate presentation of most basic information in these subjects

Pathogens, Immunity & Antimicrobials

- integrated introduction to pathogens and defense against them
- more efficient presentation of antimicrobials
- introduction to pharmacologic principles using antimicrobials as exemplars
- greater emphasis on immune system as defense system

Physician, Profession & Society 1

- provides further insight into the role of physicians in society and healthcare

Mind, Brain & Behavior

- continue emphasis on gaining understanding of normal structure/function
- integrate normal structure/function related to nervous system and behavior

Integrated Systems-Based Disease Mechanisms, Diagnosis & Therapy

- integrated presentation of disease mechanisms, diagnosis, and therapy
- broader range of content relevant to clinical practice

Physician, Profession & Society 2

- provides further insight into the role of physicians in society and healthcare

Transition to Third Year

- broad overview of preclinical topics to prepare for clinical work
- basic clinical clerkship-related skills and orientation