A New Medical Curriculum for the 21st Century

Michael F Lubin MD FACP
Professor of Medicine
Visiting Professor
University of Tokyo

Summary

- The old Emory curriculum
- Why change?
- The new curriculum overview
- The four parts of the new curriculum
  - Foundations (Human basic health and disease)
  - Applications (basic clinical medicine)
  - Discovery (student research)
  - Translation (further clinical information + back to basics)
- What kind of doctor are we trying to make?

Emory University's 20th Century Curriculum

- A standard American Curriculum
  - The first year:
  - Anatomy, embryology, physiology, biochemistry, cell biology, histology, neurobiology
  - The second year:
  - Pathology, pathophysiology, microbiology, immunology, pharmacology, physical diagnosis

Emory University's 20th Century Curriculum- PROBLEMS

- There were many hours of lecture on most days; some laboratory sessions
- There were many bored and exhausted students many of whom did not go to class
- It was so bad--There was a "transcript team" - a few people who went to class and took notes for the rest of the class!!!

Emory University's 20th Century Curriculum

- The third year: 12 months of clerkships
  - 3 months of internal medicine
  - 2 months of surgery
  - One and a half months of pediatrics
  - One and a half months of obstet gynecol
  - One and a half months of psychiatry
  - One month of neurology
  - One month of family medicine
  - Two weeks Radiology
  - One week dermatology

Emory University's 20th Century Curriculum

- Fourth year (8 months):
- One month internal medicine sub-internship
- One month surgical subspecialty
- One month Emergency Medicine
- 4 months of electives
- One month of vacation (internship interviews)

Is there another way? 1994

- **After only 40 or 50 years**, someone asked: might there be a better way?
- So they “fiddled around” a bit around the edges
- In 1994, they decided to cut back on some lectures and add some Problem Based Learning:
- First year (M1)- 6 cases for 3 weeks (2 hour sessions)
- Second year (M2)- 8 cases for 2 weeks (2 hour sessions)
- A case presentation was made and there was discussion with a basic science professor and a clinical professor. Students were to ask the questions and find the answers- variable success
- Two new courses: biostatistics and preventive health

Real Progress!!

- In 2004, (only 10 years later?!) Dean Tom Lawley decided the time was right for a new curriculum
- Why?
- Plan to build a $15 million education building (many teaching rooms; simulation rooms; OSCE rooms)
- Time to try something new and different

Why?

- Explosion of knowledge and new disciplines
  - Molecular biology
  - Nano-medicine
  - Biomedical engineering
  - Informatics- computer science
  - Decision making systems
  - Robotics
  - New imaging technologies

What is the desired "Product"?

- What kind of MDs do we want to produce?
- Characteristics
  - Superb clinicians (as before)
  - Passionate about medicine and making a difference
  - Understand the social, psychologic and economic issues of the society
  - Curious about medicine and creative thinkers
  - Lifelong learners
  - Future leaders of medicine

Guiding Principles- Theory

- Culture Change for the School of Medicine- medical education will be clearly valued and explicitly supported
- More Integration- both horizontal (across disciplines) and vertical (across years)
- Early introduction to clinical medicine
- Flexibility
- Discovery (research) phase for creativity, curiosity

Guiding Principles- Practice

- Reduced lecture time
- Increase use of patient simulators
- Excellent faculty mentoring
- Extended exposure to master clinicians
- Capstone Course at the end- some return to basic science

Guiding Principles-What to Teach

- Competency based curriculum
  - Clinical practice
  - Application of medical knowledge
  - Critical analysis
  - Professionalism
  - Lifelong learning
  - Effective communication
  - Moral reasoning and ethics
  - Personal awareness and wellness

How to Do It--"Society" System Faculty Involvement

- The Old Legacy System (formerly led by each of four deans)
- Now 1 leader and 3 additional faculty in each society (8-9 students/faculty)
- 30% pay supplied by Dean's Office-directly for teaching!! This is new!!
- Faculty serve as clinical skills & small group teachers
- Long term relationship/advising

Society System- Close Supervision

- There are 4 societies
- Each is led by one major “mentor” responsible for care of 36 students but major care of 9 students
- There are three sub-mentors in each society who care for 9 students each
- Total of 16 mentors who watch over their respective groups for all 4 years but particularly during the Foundation Phase

Mentor + Role Model+ Parent

- These faculty are great influences on the students
- They MENTOR- help them figure out what is important and help them with projects and getting others to help them
- BUT- they also are ROLE MODELS for how doctors work, behave, how they dress, how they take responsibility, etc.
- They keep track of (PARENT) their students, keep them on the right track, discipline them when necessary and give them feedback, and give them support too

Four Educational "Phases"

- Phases that integrate the curriculum and cross departmental lines

- Foundations of Medicine (15 months)
- Application of Medical Science (12 months)
- Discovery Phase (5-10 months) or more
- Translation Phase (8 months)

- We will discuss each of these phases in detail

Educational "Phases"

- Foundations of Medicine (15 months)-
  - core knowledge of basic and clinical sciences
  - Early introduction to patient care->
  - Longitudinal out patient clinic experience
  - Elective time
  - Volunteer experience

(More detail later)

Educational "Phases"

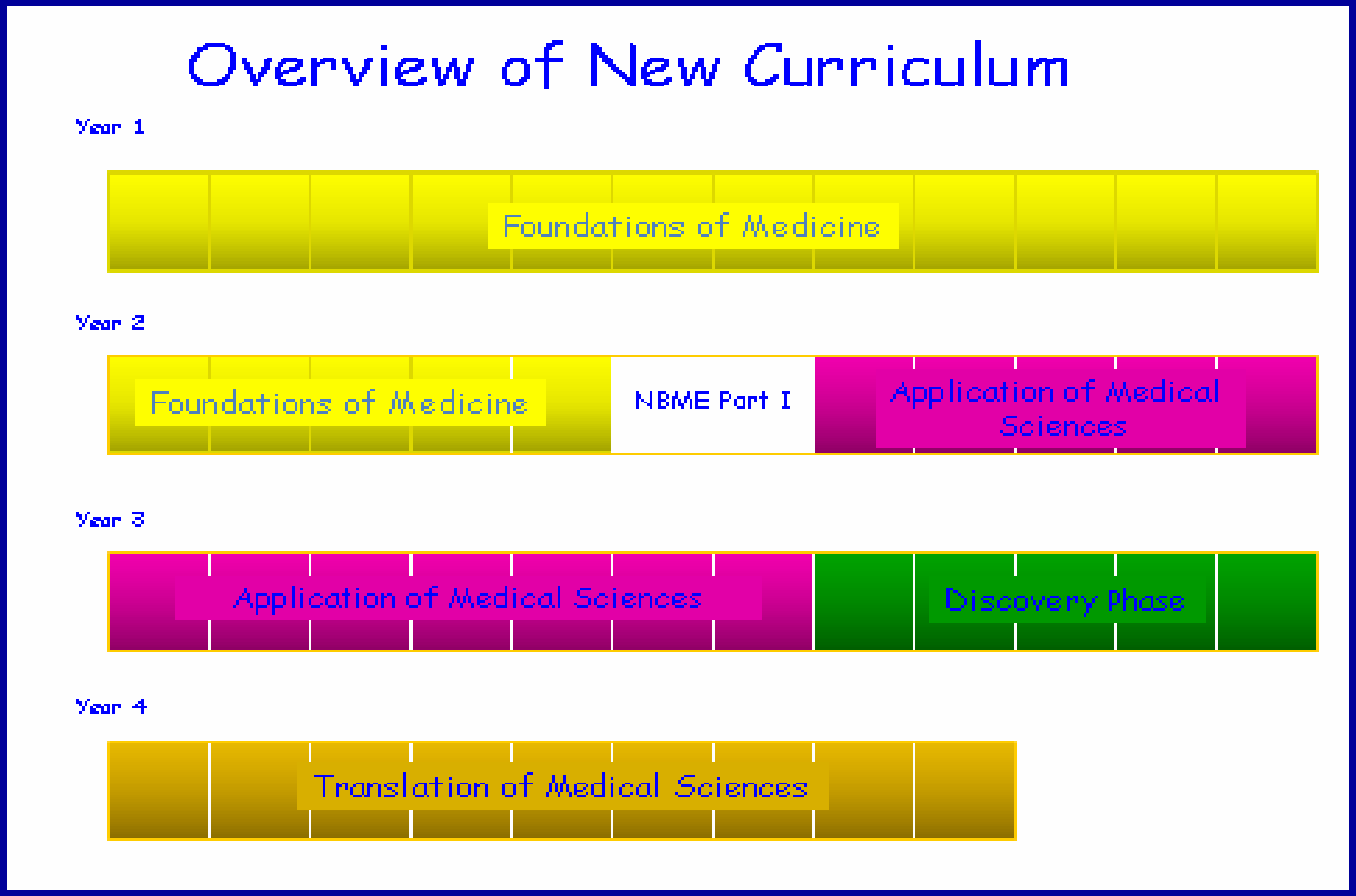
- Applications of Medical Science (12 months)
  - Core knowledge of basic medical specialties
- Discovery Phase- (5-10 months)
  - This is entirely new!!
  - Specific area of enquiry chosen by the student in lab science, clinical research, public health or health policy
  - Generation of new knowledge and to introduce research to all students

Educational "Phases"

- Translation of Medical Sciences (7-8 months)
  - Time to explore more specialized areas of medicine, complete advanced competencies in clinical medicine, and prepare for residency

- Also- Maximize unique resources at Emory- Georgia Institute of Technology, Carter Presidential Center, Centers for Disease Control and Prevention

Overview


Overview of New Curriculum
Year 1
Foundations of Medicine
Year 2
Foundations of Medicine
NBME Part I
Application of Medical Sciences
Year 3
Application of Medical Sciences
Discovery Phase
Year 4
Translation of Medical Sciences

Foundations: Competencies

Medical Knowledge
Problem Solving
Professionalism
Clinical Skills
Self Development
Communication
Interpersonal skills

Back to Foundations: Educational Theory

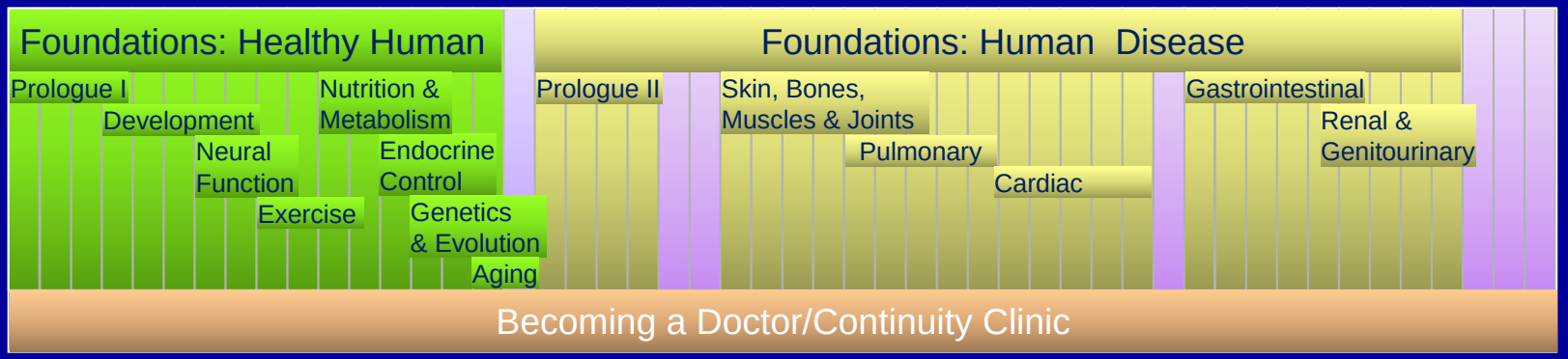
- Teach key concepts without unnecessary detail and avoid duplication!! -(try to avoid “burnout”)
- New modes of teaching (PBL, simulations, standardized patients) keep students interested and curious
- Have clinicians and basic scientists work together to form the curriculum and teach
- Decrease time to 18 months (rather than 24) and decrease lecture time- < 2hours a day
- More faculty interaction

Changing Principles- Different "Angle of Attack"

- Foundations of Medicine Phase
  - THIS WILL BE THE OPPOSITE OF PREVIOUS EMORY AND MOST CURRICULA!!
  - Begin with the study of the whole living human and the society and environment where they live
  - Next: integrated analysis of organs, biologic systems and the study of cells
  - Sub-cellular anatomy and physiology

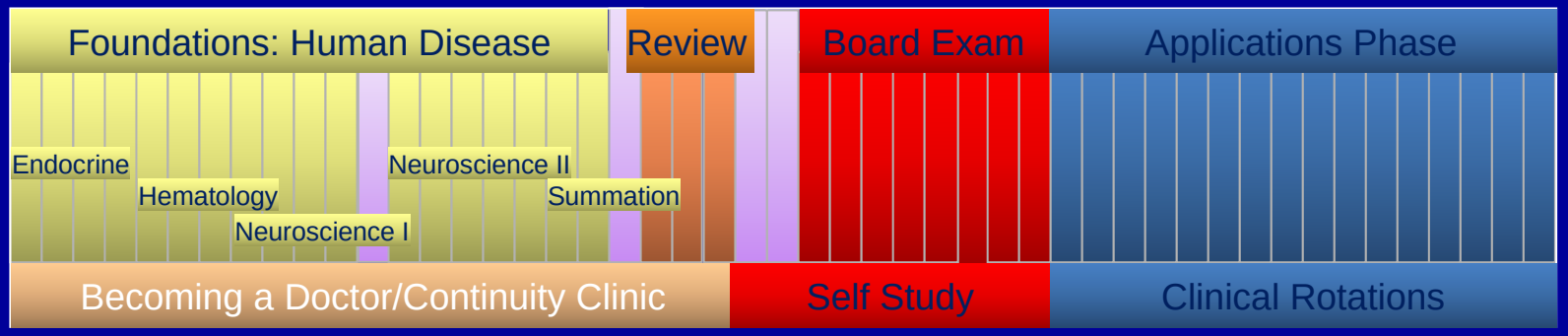
FOUNDATIONS OF MEDICINE CURRICULUM

Year 1



Year 2

Designates Vacation Time



Foundations: Healthy Human

- Begin with some cases as “Hooks”
- Healthy Human- biosphere, population health, social medicine (School of Public Health, Centers for Disease Control)
- Cognitition and behavior
- Homeostasis
- Organ structure and function
- Tissue studies
- Cellular and molecular biology
- Evolutionary biology---> leading back to Biosphere!!

Foundations: Healthy Human

- Other pieces of the puzzle
- Human anatomy
  - Anatomical dissection remains
  - BUT-
  - Anatomical models
  - Major use of imaging
    - Xrays/ CT/ MRI

Foundations: Healthy Human

Prologue I: 3 weeks

- Week 1: Orientation
- Week 2: Week on the Inpatient service (HOOK!)
- Week 3: next slide---->

Prologue- Week 3

Monday Determinants of health	Tuesday Threats to health	Wednesday Becoming a patient	Thursday Becoming a doctor	Friday Balance
Patient presentation	Global threats to health:	HIV epidemic	Cutural context: the healer	Homeostasis
Definition of health and disease	Poverty, environment Violence, disease	Becoming a patient: pt interview	Social contract with society	Reflective writing about culture and
The determinants of health	Small Group Dr/Pt; Dr in society;	OSCE suite Physical exam; hand	OSCE suite Physical exam:	Maintenance of personal health
	HPI with group leader and standard pt	Washing; inspection; vital signs ENT	same	Small group Discussion reflective writing

Foundations: Healthy Human

The Healthy Human: 13 weeks

- Embryology Tissues Cells (ETC): Weeks 4-6
- Neural Function: Weeks 7-9
- Exercise: Weeks 10-11
- Nutrition: Weeks 12-13
- Endocrine Control: Week 14
- Genetics and Evolution: Weeks 15-16
- Aging and Death: Week 17

Embryology Tissues Cells [ETC] (wk 1 of 3)

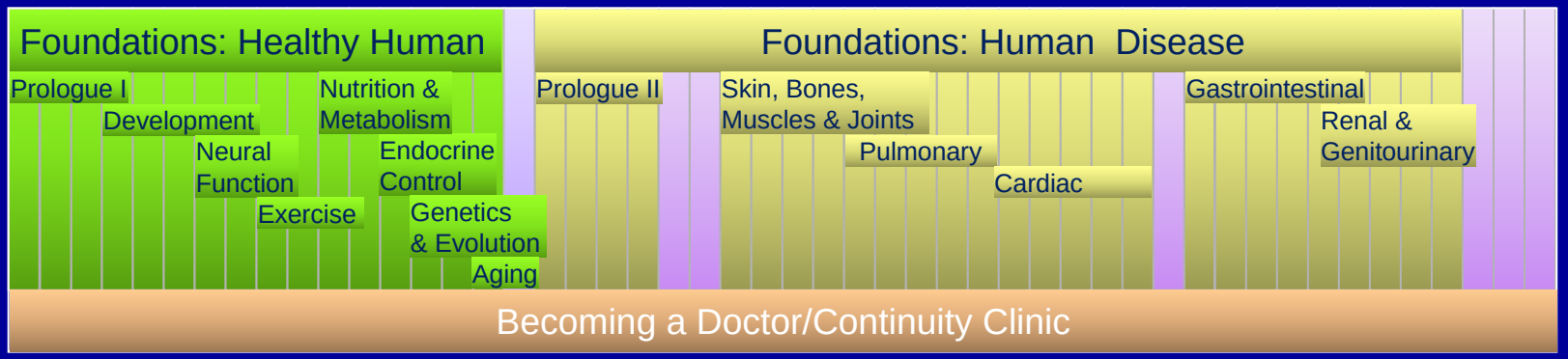
Monday	*Tuesday*	*Wednesday*	*Thursday*	*Friday*
Case Presentation: Skin as Study of epithelia	Epithelia		Basic Cell 1: Basic Organization	
	Epithelia Lab and Basic Intro. To Skin	Embryology: Mechanisms of Birth Defects	Basic Cell 2: Membrane Structure/Function	Review Session
Basic Mechanisms of Differentiation		Ectoderm	Basic Cell 3: Exocytic Route, Mitochodria	
Morphogenesis and Cell Interactions		Endoderm	Basic Cell 4: Endocytic Route, Peroxisomes	
	1-2:45pm SG Discussion: Read/watch and discuss pt's experience of illness, autonomy	1-2:45 pm OSCE Suite-O&S Societies Physical Exam: Skin, Cardiac and Lung (basic) incl draping	1-2:45 pm OSCE Suite-H&L Societies Physical Exam: Skin, Cardiac and Lung (basic) incl draping	
				Quiz / Test

Foundations: Healthy Human

- Mini clerkship
- Three week experience in physical diagnosis and clinical exposure

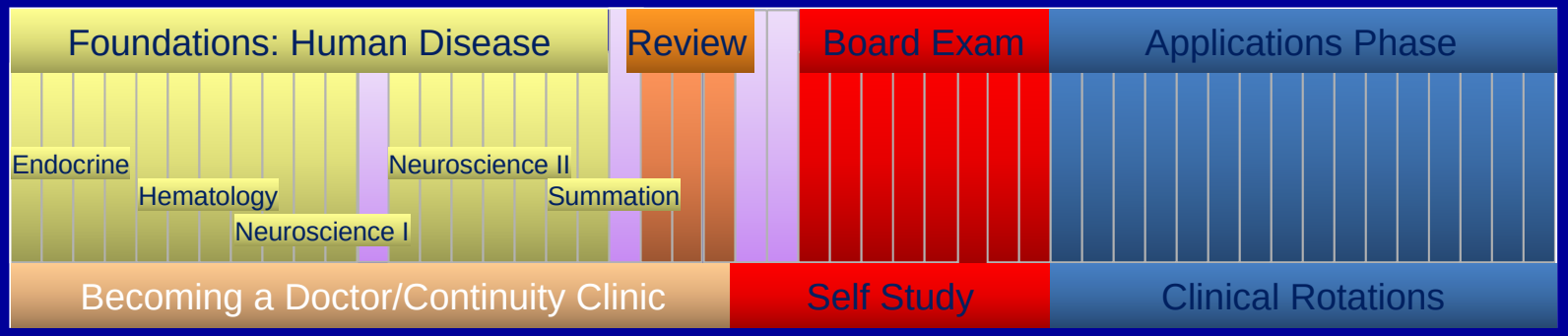
FOUNDATIONS OF MEDICINE CURRICULUM

Year 1



Year 2

Designates Vacation Time



Foundations: Human Disease Abnormal and Normal

- Prologue II: Basic Pathology, Microbiology, Pharmacology
- Skin, Muscle, Bones, Joints: 4 wks
- Pulmonary: 5 wks
- Cardiovascular: 5 wks
- Gastrointestinal: 4.5 wks
- Renal/GU: 4.5 wks
- Endocrine/Reproduction: 4 wks
- Hematology: 3 wks
- Neurosciences: 9 wks
- Summation: 2 wks
- Review: 4 wks

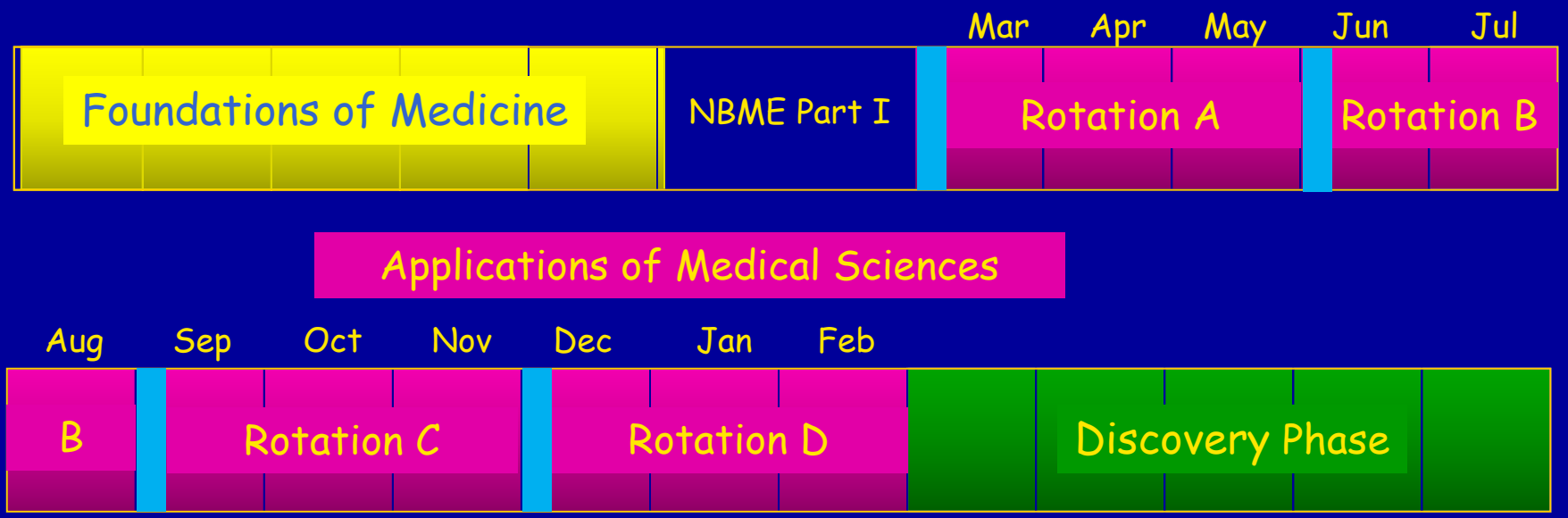
Phase II: Pulmonary module

			Pulmonary: Week ONE		
	MONDAY 2/4	TUESDAY 2/5	WEDNESDAY 2/6	THURSDAY 2/7	FRIDAY 2/8
8-9	Case: Cystic Fibrosis	Anatomy: Clinical Thorax	**OPEN**	**OPEN**	Pathology: Pneumonia
9-10	Genetics of Cystic Fibrosis	Anatomy Lab 6 - Thorax	Structural Basis Resp Function	Cilia / Lab Overview	CO and other problems
10-11	Infections in Cystic Fibrosis		Common Pulmonary Pathogens 1	Cell Biology and Histology: Laboratory	Soc Small Groups: AW clear, infxn, bronch
11-12	Organization of the Thorax		Common Pulmonary Pathogens 2		
PM					
1-2		Pulmonary H&P	Clinic (Lister and Harvey)	Clinic (Osler and Semmelweis)	Radiology of the Thorax
2-5					Anatomy Lab 6 - Thorax

Foundations: Human Disease

- Elective time (summer of first year)
  - Can be in many areas: basic science, public health, ethics, administration
  - Meant to help identify an area of study for Discovery Phase
- Medical Service Project: work with underserved populations- Atlanta, rural Georgia, other countries
- Capstone session- comprehensive review of the 15 months of Foundation!

Application Phase



Application Phase

- Clinical Blocks interspersed with a week of preparation (knowledge and skills)
- Increase in Out-Patient experience
- Ongoing mentoring by Society Advisor
- Working in of foundation sciences as possible
- Continue emphasis on responsibility to the patient
- Complete these rotations before career decisions must be made!
- More elective time to figure out choices of career

Application Phase

- One week of initial orientation overall
  - Legal issues (privacy, notes)
  - Working with a ward team
  - Presentations
  - Information system use
  - One day comprehensive OSCE - identify students who need additional help and if there are sites that need to do a better job of teaching these skills

Application Phase

- Rotations
  - Internal Medicine
  - Surgery
  - Pediatrics
  - Obstetrics/Gynecology
  - Neurology/Psychiatry

Application Phase

- One week introduction to core skills of rotation
- Also discussion of basic science that is applicable
  - Examples- surgical techniques
  - psychiatric interviewing skills
  - Physical exam skills
  - Pathophysiology
- Core reading assignments
  - Clinical readings
  - Basic science readings

Application Phase

- Faculty Development Will be Critical !!
  - Teaching faculty will have to be compensated for these activities
  - Teaching faculty will have to be promoted for their teaching activities if we are to have at least some senior faculty do the teaching
  - Importance of faculty mentoring!!

Discovery Phase

- Foundation for understanding and appreciating basic science, clinical and population research
- Demonstrate what research can do to improve the health of patients and the public at large
- Develop a respect for critical necessity of continued discovery
- Identify students who are interested in research as a career

Discovery Phase

- 5-9 months
- Mentored and involves discovery/creativity
- An end-product (abstract, paper, or just "published" at Emory) approved by the mentor
- Can add a tuition free year
- Flexibility in timing
  - Delay until after clinical electives
  - After the MPH or MS year

Discovery Phase

- Student is not a passive observer!
- At end, student will prepare a report
- All reports will be published in the Emory Student Journal of Medicine
  - (will probably be electronic for low expense)
- Students can use other elective time and summers to do more research and make more progress

Discovery Phase

- Students can use this research for
  - MD/PhD
  - MD/MPH
  - MD/MS
    MD/MBA
  - Perhaps even MD/JD or MD/DTheology

Translation Phase

- 3 Electives
- 2 Months for Interviewing/Vacation/Electives
- 4 Required Courses
- Senior Clerkship (sub-internship) in Medicine, Pediatrics, OB/GYN or Surgery
- Intensive Care Clerkship (Medical,Surgical, Pediatric, Neurologic…..)
- Emergency Medicine Clerkship
- Weekly continuity clinic again
- Capstone Course

Translation Phase

- Capstone Course (uncertain content)
- 1) Difficult Doctor/Patient interactions
- 2) Doctor/Doctor and Doctor/nurse/Physical therapist/Occupational Therapist/Social Worker communication/teamwork
- 3) Medico-legal issues
- 4) Safety
- 5) Ethics
- 6) Basic Intern skills (geared to specialty)
- 7) Review of new science since beginning Medical School

Conclusion

- Emory's new curriculum will develop physicians who:
- Are professionals
- Are superb clinicians and can apply medical knowledge
- Can develop new knowledge
- Can critically analyze new information
- Can effectively communicate
- Are personally aware
- Are lifelong learners
- Have good moral reasoning and ethics

Thanks

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Questions?