

Unit 6  
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## Model Name: Problem based learning in medical school

Target student audience: students in first two years of a four-year medical program

### **Context**

#### Situation

The curriculum for the first two years of medical school at SUNY Upstate Medical University in the past only allowed students the opportunity to study basic science facts without any hands on, practical application. Patient contact and the chance to apply the knowledge they had amassed did not occur until the third year. The new curriculum implements a course in the first year known as Practice of Medicine (POM) in which the basic sciences learned in lecture courses are combined with problem based components. In POM students interact with tutors, each other, and trained simulated “patients” to transform information gained in lecture into skills with real-world application. This course has been developed in order to meet the educational needs of future doctors, with medical students taking the first steps toward integrating factual knowledge with real life situations rather than simply accruing data to apply at some later time. Hopefully this integrative process will enable them to begin to formulate from the very beginning of their training the complex differential diagnoses they will need to make later in their careers.

#### Key Drivers, Concepts, and Learning Assumptions

This course assumes that basic science must be integrated with problem solving skills. In order to achieve this, students are provided an opportunity to learn in large lecture for basic science courses, while POM integrates small group learning (12-13 students) with a practicing primary care physician as a tutor. Partner and individual learning also occur throughout the coursework of the students. The small group and partner interactions allow students the opportunity to display knowledge learned in lecture and reviewed individually. The knowledge must be integrated with interpersonal skills, understanding of social and ethical issues, and problem solving skills in order to accurately diagnose and solve authentic problems. This course assumes that using all forms of group and individual learning benefits students more than large group and lecture.

Additional assumptions of this program include:

- Integration of formidable factual knowledge with small group tutor directions and individual study will be combined for maximum learning.
- When a medical student approaches a topic it is better for the student to look at topics in an integrated curriculum in relation to each other rather than as multiple isolated curriculums.

- Learning content while engaging in authentic problem based learning situations leads to more qualified and capable practitioners.
- Application of basic science and facts to varying circumstances according to patient needs better assists students in preparing for their careers in medicine.

Goals

Program Characteristics

- Provide students with the skills, the analytical tools, and the ethical context to integrate basic and clinical scientific knowledge within a biophysical model of healthcare.
- Provide students with a transitional experience as they leave undergraduate school behind and embark on their professional education.

Learning Outcomes

- Student will learn how to talk to, examine, and evaluate patients.
- Students will explore the statistical, epidemiologic, ethical and social context in which medicine is practiced.
- Students will practice their newly acquired skills via patient encounters in the outpatient setting.
- Students will apply basic science concepts directly to individual patient needs.

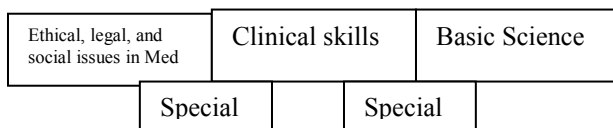
**Instructional Model**

Overview

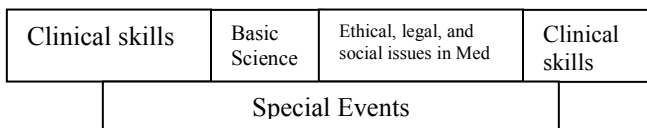
Students will take basic science courses along with POM for the first two years of medical school in order to integrate knowledge gained in science courses with simulated experiences of real world situations. In the POM courses, students study ethical, legal and social issues in medicine, evidence based medicine, and clinical skills. Students will also spend time in special clinical events with guest lecturers, presentations, etc.

The Practice of Medicine

Year 1



Year 2



Delivery Methods

Instruction will be provided by:

- Teachers in lecture situations
- Physician tutors in small group situations
- Peers in partner situations

- Supplemental text for individual learning situations
- Supporting web resources: Black Board providing discussion, web resources, research articles, videos, and diagrams

### Grouping

- Lecture: 150 students in basic science courses
- Interactive Small Group: 12-13 students with practicing primary care physician as tutor (continuity of groups and tutor assignment will be maintained for 2 years). Students receive feedback from tutor as well as from one another.
- Paired group: practice examination skills (continuity of paired groups will be maintained for 2 years)
- Student interacts with volunteer simulated patient-volunteer as well as tutor give feedback
- Individualized Instruction: student works alone with text, notes, and research to prepare for courses, and to build knowledge for group learning.

### Management Methods

Students follow a set curriculum for the first two years of medical school. The first year of medical school emphasizes the normal structure and function of the human organism. Students acquire the vocabulary and conceptual framework necessary to understand and apply basic science to clinical situations. The second year focuses on understanding the mechanisms and pharmacologic treatment of disease, and further developing clinical and professional skills.

1<sup>st</sup> year

<b>COURSE #</b>	<b>COURSE</b>	<b>Credits</b>	<b>SEMESTER</b>
MANA 106G	Summer Anatomy	9	Summer
MMFM101	Molecular Foundations of Medicine	9	Fall
MANA107	Human Anatomy	9	Winter
MBBH101	Brain and Behavior	7	Winter
MANA108	Microscopic Anatomy	4	Spring
MPHY101	Physiology	6	Spring
MPOM101	Practice of Medicine 1A	5	Fall
MPOM102	Practice of Medicine 1B	3	Winter/Spring

2<sup>nd</sup> year

MICI201	Microbiology/Immunology	8	Fall
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MPTH201	Pathology	10	All year
MPPH201	Pathophysiology	6	All year
MPHM201	Pharmacology	7	All year
MPOM201	Practice of Medicine II	9	All year
MBSC201	Behavioral Science	4	Winter

### Instructional Process

Topics covered in large group are broken down into components of study. The learning process begins with information gained in basic science lectures. This material is reinforced and utilized in the small group setting lead by a physician tutor in weekly three-hour sessions. Student pairs initially interview and examine each other under the direction of the tutor as part of these sessions. The tutor then observes the students individually interview simulated patients (comprised of a pool of trained volunteers) with immediate feedback by both the trained patient and the tutor. The student is critiqued on such things as body language, style of questioning, degree of empathy and ability to elicit information. Individual work continues with the student doing a write-up of the simulated patient encounter, including researching the differential diagnosis of the problem that arose during the encounter. The write-up is presented during one of the small group sessions for discussion and a written copy is handed in for grading by the tutor. Students are also expected to reinforce learning from group lecture through individual study of notes and available resources, as well as develop critical reading skills by reviewing current research on medical problems.

### **Development Strategy and Plan**

	<b>Component for development</b>	<b>Steps for development</b>	<b>Individual(s) responsible for implementation</b>
1	Integrate problem based learning into existing curriculum	Present new curriculum to curriculum committee at medical center	Physician coordinator Assistant coordinator
2	In-depth basic science lecture	Basic science concepts presented/taught to students	Basic science teaching staff
3	Individual study	Research, study, and obtain understanding of topics covered in basic sciences	Student
4	Small groups	Create groups of 12-13 students with physician tutor for each group	Assistant coordinator
5	Appropriate groupings	Develop appropriate groups based on gender, age, and cultural diversity	Assistant coordinator
6	Tutors	Recruit and train physicians to be tutors; offer incentive for tutoring	Physician coordinator

7	Time for tutorial session	Find time in existing schedule for one 3 hour session per week with small group	Administrative assistant Curriculum office
8	Space	Find adequate appropriate space for physical examinations	Administrative assistant
9	Funding	Apply for grants to cover costs physicians, equipment, and trained patients	Medical center grant writer
10	Logistics: space, patient scenarios, equipment, and scheduling of classes and volunteers	Provide all logistical arrangements for students and tutors	Administrative assistant
11	Trained patients	Recruit and train simulated patient volunteers	Volunteer office Assistant coordinator
12	Web resources	Develop web-based and adjunct tutorials	IT medical center staff Assistant coordinator
13	Scenarios	Develop needed range of scenarios to be used for patient encounters	Physician coordinator
14	Evaluation	Develop various methods of evaluation to determine effectiveness and usefulness of integrated course	Assistant coordinator

### Job Descriptions

Physician coordinator: full time academic med center teacher

Assistant coordinator: advanced education degree/education specialist

Administrative assistant: team secretary