DEVELOPMENT AND IMPLEMENTATION OF AN INTERDISCIPLINARY, MULTI-MODAL SECOND YEAR COURSE

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INTRODUCTION. Patient-Doctor II (PDII) is an interdisciplinary 316 hour course in the second year of a 4 year medical school curriculum. It combines history taking, physical examination, and differential diagnosis with previously free-standing courses of Behavioral Science, Biostatistics, Epidemiology, Ethics, Human Sexuality, Nutrition, and Toxicology. In addition, new material from cross-cultural medicine, genetics, geriatrics, and medical economics has been included. The course incorporates detailed objectives for each of these areas of knowledge, and emphasizes development of literature searching and critical analysis skills. The PDII course utilizes diverse educational methodologies, such as student-oriented teaching, seminars, peer teaching sessions and problem-based learning concepts.

While there had been several previous efforts at curricular reform at the University of California Irvine, most had had no significant impact on a strongly traditional medical curriculum. Three years ago, however, pressures for change including LCME recommendations and student dissatisfaction resulted in the hiring of a proactive Senior Associate Dean for Medical Education and the formation of a Blue Ribbon Committee to review the medical school curriculum.

GOALS AND OBJECTIVES. The objectives of this new second year course were several: 1) To address student and faculty dissatisfaction with a rigid traditional medical school curriculum 2) To introduce and encourage the application of innovative educational theories and methodologies, such as problem-based learning 3) To stimulate integration of history taking and physical examination with other independent courses, in the process relaxing rigid departmental barriers and promoting faculty cooperation and interaction 4) To develop intellectual skills in knowledge synthesis and clinical problem-solving rather than rote memorization of facts 5) To emphasize student-centered rather than faculty-centered learning.

METHODS

COURSE DEVELOPMENT (See Figure One). In an effort to enfranchise all potential future participants in PDII, widespread involvement of faculty and students occurred through the formation of a multidepartmental Task Force to direct course development. This Task Force included former directors of the freestanding courses (now called course advisors), faculty from an affiliated hospital (Long Beach VA), as well as faculty from anesthesiology, family medicine, obstetrics-gynecology, pediatrics, and surgery, these latter now relying on PDII to provide an introduction to their disciplines. The head of the College of Medicine's information management instruction program (i.e., biomedical library and resource center) played a key role in coordinating course objectives with library resources and Departmental chairs and 3rd and 4th year medical students and staff from the Office of Medical Education were integral to the process. This large group decision-making process was instituted nine months prior to implementation of the course.

PROBLEM-BASED LEARNING (PBL). Overall, the faculty had virtually no experience with problem-based learning. In an effort to educate ourselves, the Task Force consulted with UCLA faculty who had worked with the Harvard PBL group and also organized a two-day faculty workshop, conducted by experts who had pioneered PBL at the University of New Mexico.

MULTIMODAL INSTRUCTIONAL METHODOLOGIES. Because of the complexity and interdisciplinary nature of the course, PDII incorporates various innovative and relevant teaching methods. (See Table 1). These include surrogate patient interviews, student peer teaching, expert small group discussions, faculty panels, large group demonstrations, supplemental problem-solving sets, ethics case discussions, literature and searching skills. Course revision is based on ongoing evaluation of all course components.

COURSE STRUCTURE. (See Figure 2) The basic course structure consists of eight organ-based modules (e.g., cardiovascular, respiratory, etc.) developed around a specific history introduced by a surrogate patient and incorporating a particular set of medical, social, cultural and environmental problems. Small groups of 7-8 students and two co-leaders (MD and non MD) form the core unit that investigates various aspects of the patient's problems throughout the year. A surrogate interview is conducted at the start of the module (Figure 2) and specific learning objectives identified. During the module students meet with experts to discuss the learning objectives and then return to their group for peer-teaching sessions (RAP session). In addition, students use paid volunteers to conduct normal physical examination of each specific organ

system and, during station rotation, examine patients with defined diseases in that specific organ system. Consolidation of the learning objectives occurs during the final small group session

FACULTY ROLES. (See Figure 3). Overall responsibility for course development, implementation and supervision belongs to the course co-directors, a physician rheumatologist from the Department of Medicine, and a psychologist/ethicist from the Department of Family Medicine. A half-time staff coordinator based in the Office of Medical Education and responsible for day-to-day course operations is also assigned to the course.

COURSE ADVISORS AND CONSULTANTS. A physician coordinator reviews the clinical case for each module and helps recruit and train surrogate patients. Course advisors (the former free-standing course directors) develop comprehensive and specific overall course objectives in their particular area of expertise, develop relevant learning objectives for each module, review each case to ensure adequate content material and either serve as or identify an Expert for small group teaching. In addition, all faculty involved in the second year curriculum, as well as medical specialties that had formerly participated in the History, Physical Examination and Diagnosis course (i.e., Anesthesiology, ENT, Neurology, Ob/Gyn, Ophthalmology, Orthopedics, Pediatrics, and Surgery) participate as course consultants.

CO-LEADERS. Each basic student group is associated with two co-leader faculty members, a physician and a non-physician who remain with the group for the entire year. Co-leaders facilitate group interaction and provide feedback on student interviewing techniques. They also assess

individual student oral presentations of learning assignments. They are not necessarily expected to have special expertise in the knowledge areas under investigation by the students.

EXPERTS. An Expert is a faculty member who has knowledge and skills relevant to specific learning objectives in the module (i.e., ethics, human sexuality, toxicology, etc.). It is the responsibility of Course Advisors to identify an Expert for each module. The Expert facilitates general discussion of the learning objectives for a small group of students and subsequently critiques the students' written responses to the learning objectives.

PRECEPTORS. The Preceptor role is filled by full-time and volunteer physician faculty who instruct small groups of 4 students each in physical examination, either of normal exams or of specific signs related to the organ system being presented in a given module. **[mention history taking in last 4 months]**

COURSE COMPONENTS. Within each module, a structured series of learning activities occurs (Figure 2).

SURROGATE PATIENT SELECTION.

SURROGATE PATIENT INTERVIEW. In the initial session of the module, students choose various roles and responsibilities defined in Figure 4. The Interviewing Student interviews a surrogate patient. Students are expected to improve their interviewing and history taking skills

while eliciting patient problems and general learning objectives. Co-Leaders review the case and learning objectives prior to the Surrogate Interview to help the student keep the interview properly focused. To maintain focus, either the Interviewing Student or a Co-Leader can call a time-out in order to redirect the interview, help the student with interview techniques, clarify issues or identify learning objectives. After the interview, students are provided with the physical findings and pertinent laboratory results, which they utilize in writing up the case and discussing management. The Interviewing Student's performance is then critiqued by the group and the Surrogate. Next students review and allocate among themselves the learning objectives, which have been identified in advance by the Course Advisors. Learning objectives identified during the patient interview may also be added.

PHYSICAL EXAMINATION AND DIAGNOSIS. During the ensuing weeks, students participate in three physical examination and diagnosis exercises. i) A large group demonstration (entire class) uses an internal medicine preceptor to model a comprehensive exam on the specific organ system identified by the module. The Preceptor utilizes student discussion and participation, as well as tools such as tapes and computer simulations to convey the proper method for completing the examination. ii) The Normal Physical Examination session involving specific organ systems is conducted by physician Preceptors working with a group of 4 students for the entire year, and uses recompensed normal subjects. iii) In the Station Rotation session, patients with selected abnormalities of a specific organ system are examined by groups of 4 students and a Preceptor. During these sessions, the group of students rotates every 20 minutes between six patients with different physical findings. In this manner, all students are exposed to a

core of defined clinical conditions, thus insuring a defined data base and quality control in physical diagnosis.

EXPERT DISCUSSION. Students from each of the twelve basic groups responsible for the learning objectives in a particular area (e.g., behavioral science, genetics, nutrition) meet with a faculty Expert for 3 hours. Students prepare in advance for this session through independent library research. The Expert avoids didactic presentation, and assists students in understanding the relevance of the information which they have independently obtained. Information acquired in the Expert discussion is then relayed to the basic learning groups through the Rap session (see below).

INFORMATION MANAGEMENT INSTRUCTION. Students are scheduled to meet at regular intervals with librarians who provide an overview of resources used to search the medical literature throughout the PDII modules. This training includes a demonstration of the on-line catalogs and database systems, literature searching, critical appraisal skills, and Internet applications.

TITLE

Introduction

Goals and Objectives

METHODS

Course development

Problem base learning

Multimodal instructional methodologies

Course structure

Faculty Roles

a. course advisors and consultants

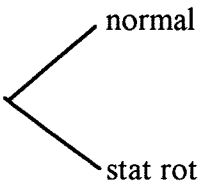
b. coleaders

c. experts

d. preceptors

Course Components

a. Surrogate patients - selection and interview

b. PE 

c. Expert small group discussion

d. information management instruction

e. RAP

TABLE 1.

COMPONENTS OF PDII

Surrogate Patient interviews

Student peer teaching

Expert small group discussions

Faculty panels

Large group demonstrations

Supplemental problem-solving sets

Literature searching skills

HOW WELL ARE THEY LEARNING?
CAN EACH ONE TEACH ONE?

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Objectives: The purpose of this study is to determine whether quiz scores of second year medical students in our Patient-Doctor II course differed according to whether the students were specifically assigned to research learning objectives in a particular discipline ("owners" of the objectives) or they were fellow students in a small group ("secondary learners") who received a brief oral report plus a written report from a classmate who researched the objectives. Additional factors related to this question are also being explored, including variation associated with the individual student, the discipline with which the objectives were identified, the small group to which students belonged, and the specific (monthly) module of the course to which the objectives related. This study does not evaluate the portion of the Patient-Doctor II course previously known as Examination of the Patient.

Methods: Answers to questions on four quizzes (a total of 87 questions) are being analyzed by specific discipline contributing questions for each of four monthly modules for the eighty-six students enrolled in the Patient-Doctor II course. In addition, information has been collected regarding the specific small group to which each student belonged, and to which learning objectives each student was assigned in each module. Data for the study will be described, using summary statistics to compare "owners" and "secondary learners" by small group to which they belonged, by specific discipline contributing questions, and by each of the four modules of the course. An analysis of covariance will be used to determine whether mean quiz scores of "owners" and "secondary learners" differed significantly, considering the factors student, small group, discipline contributing questions, and module with which the questions were associated. We will control for two covariates, a) previous year's grade point average of individual students and b) formal education obtained by individual students prior to this course in each of the disciplines represented.

Preliminary Results: An informal analysis of quiz results for two modules for questions related to Epidemiology/Biostatistics suggests that on a single quiz the scores in Epidemiology/ Biostatistics questions may be as much as 20% higher for the "owners" than for the "secondary learners." The differences are not equally great in both modules.

Conclusions: Since this work is still in progress, there are still many unanswered questions related to the differences in quiz results between "owners" and "secondary learners." Completion date for the study is estimated to be September, 1994.

Implications: It is assumed that the students in our Patient-Doctor II course will obtain an essential core of knowledge previously taught by experts in a lecture format in several "small" courses during the second year of medical school at UCI. A basic premise of our course is that students who are assigned to research specific learning objectives can educate themselves well enough in a few weeks so that they are equipped to teach the essential information to a satisfactory degree to others in their respective small groups. It is important to seek to measure whether this is happening. If it appears not to be occurring, then we will search for remedies that might be needed and possible alternative explanations for our results.