Pharmacy Education

Topic #1 – Pharmacotherapy Learning Laboratory (PLL)

About 15 years ago, I was at a school of pharmacy where dispensing of prescriptions was a lab experience performed in the last semester of a BS 5 year curriculum. I thought then, and I still think today, that putting labels on prescription vials in a school class lab should be returned to a student's internship. The "practice labs" in pharmacy schools should emphasize a "pharmacotherapy learning" or "pharmacotherapy simulation" lab (PLL). Pharmacists' future will be dominated by their ability to "review and manage increasing types and amounts of information with final application to an individual patient." Robots will put the labels on prescription vials of prepackaged medications.

I was first struck by the profession's obsession to hold onto the tasks of dispensing of medications while a student at UCSF back in 1963. I attended a meeting at the California State Board of Pharmacy to listen to the discussion regarding the old Brewer system. Who, besides a pharmacist, could load the brewer system was the big question before the Board. As I left the hearing, I thought as long as the profession wanted to hold onto all the physical tasks of dispensing premade medications, the profession would be like a "small boat in a hurricane, whipped from here to there and back again." As clinical pharmacy started up in the mid '60s and the need to use pharmacy technicians became obvious, the resistance to change the dispensing model continues to exist today by many pharmacists and students.

What I wanted to see happen 15 years ago, was the development of a computer lab where students could work with information and the application of pharmacotherapy to patients.

About 10 years ago, I proposed at my current school the idea of a pharmacotherapy learning or simulation lab (PLL). The idea was be to have students starting in their first semester of pharmacy school be given patient cases with drug therapy issues and require them to review and make judgments about the patient's drug therapy. I think simple cases could be developed and the student could look up information to complete their assignments. After all, the pioneers of pharmacist clinical practice went from Goodman and Gilman direct to patient care rounds and we had to teach ourselves by looking up lab tests, values, and drug information in textbooks, the literature or in DeHaen drug information cards. My idea of the PLL is to have the students exposed to many patient cases over the first six semesters of their PharmD curriculum, probably 40, 50, 60+ cases. This idea was received but not really pursued or acted upon. The original written proposal included

"the proposed laboratory will be designed to enhance the knowledge of students in pharmacy informatics and to provide students with fundamental skills in pharmacy information technologies focusing on Pharmacotherapy and impact on the practice of pharmacy. Topics to be included are:
- ❑ pharmacotherapy and patient cases
- ❑ drug information and how to access
- ❑ systematic drug literature searches
- ❑ case study approach to answering drug information questions received from patients, other health professionals; and oral and written responses to questions
- ❑ technology used to manage the pharmacotherapy of disease states
- ❑ current information management needs in institutional pharmacy
- ❑ computer-based information systems and pharmacy information systems

❑ characteristics of expert systems

This PLL can also be used for the teaching of pharmacotherapy to other health profession students including medicine, nursing, dentistry, and physical therapy.

Methods
- ❑ Establish two semester courses focusing on technology used in managing the pharmacotherapy of selected disease states.
- ❑ Development of Web-based learning modules for anticoagulation therapies and selected disease states (geriatrics, diabetes, hyperlipidemia, drug interactions, etc.)
- ❑ Integrating expert systems and decision support tools such as Iliad and QMR.
- ❑ Integrating appropriate diagnostic tests and anatomical and biomedical sciences via multimedia.
- ❑ Using drug information resources, online and PDA-based, including Lexi-Comp, Micromedex, MDConsult, First DataBank, and FirstConsult, etc.

Resources
- ❑ A full-time faculty member whose teaching, research, and scholarship interests are in Pharmacy Informatics.
- ❑ A multimedia developer to assist with the development of cases for teaching
- ❑ Hardware and software for development of the course materials and for the delivery of the courses.

Benefits
- ❑ This PLL will provide students with knowledge of the use and application of information technologies in healthcare delivery, so that the student gains an understanding of how these technologies contribute to the delivery of health services and their role as a pharmacist.
- ❑ This PLL addresses the national concerns of rational and appropriate pharmacotherapy and patient safety in medication use.
- ❑ This PLL could facilitate inter-professional education of health sciences students – pharmacy, medicine, nursing, dental, physical therapy."

One of the important requirements for a PLL is facilities. It is now possible to build facilities that support this kind of teaching. Over the past 8 months the renovations of the pharmacy school labs at VCU using Steelcase furniture, especially Mediascape, provides two different PLLs. In addition, software is now available to schools of pharmacy that will facilitate the delivery of patient cases to the students for work in small groups or by individual students. An ultimate objective is to have each student present their evaluation of patient cases and be assessed on their individual knowledge. It is essential that each student demonstrate what they know and/or do not know regarding patient pharmacotherapy to their student peers and instructor(s).

I believe the development of these new PLL labs with a large number of patient cases reviewed and presented over the first six semesters, will better prepare students for their advanced professional practice experiences (clerkships) in their last year of pharmacy school. I also believe that better prepared students will allow for some significant changes in the P4 year, which will be presented in a future write up on pharmacy education.