A Patient Focused and Outcomes-Based Experiential Course for First Year Pharmacy Students

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A first year experiential course for an entry-level Doctor of Pharmacy program is described. The course objectives were to introduce students to the competencies required to practice pharmacy and to provide patient care. Students completed six modules related to expiry dates; telephone reminder and call-back programs; refill histories; ACE inhibitor use in heart failure; and population health targeted at medication-induced headache (MIH) sufferers; and were required to discuss and document their activities. Ninety one students examined 10,361 prescription products and found 255 out-dated; interviewed 524 and 424 patients, respectively, to remind them about uncollected medications and to identify drug-related problems; assessed the refill histories of 1,582 patients receiving HMG CoA reductase therapy for compliance and 721 heart failure patients for ACE inhibitor use; and designed public awareness programs for MIH. First year students were successfully introduced to the competencies required to practice pharmacy and contributed to patient care.

INTRODUCTION

The University of Colorado commenced its entry-level Doctor of Pharmacy (PharmD) program in 1999. The new curriculum was created with an outcomes-based philosophy and, in keeping with that philosophy, experiential courses were designed into each semester of the program. Experiential courses were assigned four hours per week for the first six semesters (three years) and seven 240 hour clerkships in the final year (semesters 7 and 8). This paper describes the design and evaluation of the first year, first semester experiential course (PHRD 3300) which was delivered for the first time in Fall 1999.

DEVELOPMENT OF PHRD 3300

The development of PHRD 3300 was undertaken by a faculty planning team which worked in collaboration with the school’s Education Council, an advisory body comprised of local pharmacy practitioners. The process commenced with a literature review and discussion of the philosophies of experiential training and outcomes-based curricula. Students in experiential training can make substantial contributions to patient care(1-10). Even though this literature is focused on senior students it was the planning team’s and the Education Council’s opinion that students should contribute to patient care at a level commensurate with their training throughout their education. The groups also agreed that students that contribute to patient care can provide a net benefit to the clerkship site(5).

The purpose of the school’s outcomes-based entry-level PharmD curriculum is to provide students with the professional and general competencies required to practice pharmacy (Table 1). It was felt important to introduce first year students to these competencies. To achieve this objective PHRD 3300 was structured in a modular format with six modules designed to serve as “snap-shots” of the competencies. It was also felt important to supplement the students’ experiential training by

1Manuscript based on the portfolio submitted to the 2000 Council of Faculties Innovations in Teaching Competition.

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increasing their awareness of pharmacy practice issues. Therefore, three classroom-based programs were organized with panels of speakers representing chain and independent community pharmacists and managed care pharmacists.

The six modules and three classroom-based presentations were approved by the school of pharmacy faculty. The modules were then piloted with 13 entry-level PharmD students who participated in the school’s 1999 Diversity Student Education and Scholarship Program. The course director identified 91 preceptors in the metropolitan Denver area willing to participate in PHRD 3300 and these individuals were mailed a copy of the course syllabus and timetable. In addition, the preceptors were invited to attend an orientation meeting with six options provided for meeting date and time. The course commenced on August 31, 1999 with a course orientation. The first module took place four weeks later to allow time to match each student with their preferred site.

DESCRIPTION OF THE MODULES

General Description

The modules incorporated a practical component and a number of exercises including topics for discussion with the preceptor. Each module was designed to be completed within four hours and addressed several professional and general competencies required to practice pharmacy such that each competency was dealt with at least once (Table I).

Students were required to document their work and experiences in a portfolio. The minimum content requirement for the portfolio entry for each module was title, objective, methods, results, discussion, references, identification of learning opportunities, identification of the general and specific competencies tested, impact of the module on the student, and student perceptions of the module. Students submitted the results of the practical exercises to the course director who collated and distributed the cumulative workload (patient care) statistics to the class. The course was run in parallel with a seminar course (PHRD 3200) in which students’ experiences in the experiential course were used as subject matter for 30-45 minute small group discussions. Each small group of first year students was assigned a senior PharmD student as a facilitator who also marked the students’ portfolios using an assessment rubric (Appendix A).

| Table I. Professional and general outcome competencies tested per module |
|-----------------------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|
|                            | Module 1 | Module 2 | Module 3 | Module 4 | Module 5 | Module 6 |
| Pharmacotherapy             | XXX      | XXX      | XXX      | XXX      | XXX      | XXX      |
| Legal/Regulatory            | XXX      | X        | X        | X        | XXX      | X        |
| Ethics                      | XXX      | XXX      | XXX      | X        | X        | X        |
| Drug Information/            | XXX      | XXX      | XXX      | XXX      | XXX      | XXX      |
| Education/Public Health      |          |          |          |          |          |          |
| Medication Use Systems       | X        | X        | X        | XXX      | XXX      | XXX      |
| Management                  | XXX      | X        | X        | X        | X        | X        |
| Critical Thinking and        | X        | XXX      | XXX      | XXX      | XXX      | XXX      |
| Decision-making             | XXX      | XXX      | XXX      | XXX      | XXX      | XXX      |
| Communication               | XXX      | XXX      | XXX      | XXX      | XXX      | XXX      |
| Self-learning               | XXX      | X        | X        | XXX      | XXX      | XXX      |
| Professional Attitudes       | X        | X        | X        | XXX      | XXX      | XXX      |
| and Behaviors               | XXX      | XXX      | XXX      | XXX      | XXX      | XXX      |
| Interpersonal, Intergroup,   | X        | X        | XXX      | XXX      | XXX      | XXX      |
| and Leadership Behavior      |          |          |          |          |          |          |
| Professional and             | XXX      | XXX      | XXX      | XXX      | XXX      | XXX      |
| Community Service            |          |          |          |          |          |          |

XXX Minor emphasis
X Minor emphasis

Module 1: Expiry Dates. Students were required to examine 100 prescription products and categorize them according to their expiry dates (expired, expiring < 3 months, expiring > 3 months). This was planned as a simple, non-intimidating exercise on the expectation that this would be the first time in a pharmacy as a licensed pharmacy student intern for many of the class. Each student, as a self-learning exercise in statistics, was asked to make confidence interval calculations to define the expired portion of all the prescription products at the site. The discussion topics for the module were focused on management and ethical issues including purchasing and return policies, and donations of drugs to third world countries.

Module 2: Telephone Reminder System. Module 2 required students to operate a telephone reminder system for prescriptions uncollected for > five days, and was planned to be the first opportunity for students to practice their patient communication skills. It was also planned to introduce students to patient confidentiality on the assumption that many of the telephone calls would be answered by machines or by individuals other than the patient. Students and preceptors were asked to develop an appropriate message prior to contacting patients because it was anticipated that the telephone calls might confuse some patients unfamiliar with telephone reminder systems. The students were asked to stress to the patients that they were pharmacy students making a courtesy telephone call. The discussion topics for the module focused on reasons why prescriptions are not collected, barriers to compliance, methods to improve compliance, and site policies for returning uncollected prescriptions to stock.

Module 3: Telephone Call-back Program. Students were required to call 20 patients with prescriptions dispensed within the previous five days to determine if they had encountered any drug-related problems and, if they had, to transfer the call to the preceptor. It was planned as a second opportunity for the students to practice their patient communication skills and to demonstrate that pharmacists are required to take responsibility for health outcomes in their patients. Students and preceptors, as in module 2, were asked to develop an appropriate message because there was concern that some patients unfamiliar
with pharmacy outreach programs might become confused or upset. Students were asked to discuss the benefits and drawbacks of call-back programs and to determine site procedures for documenting interactions with patients.

Module 4: HMG Co-A Reductase Refill History. Module 4 was planned as a further opportunity for students to observe and discuss compliance issues and to introduce the concept of patient-centered quality assurance programs in community pharmacy. Students were given the names of all HMG Co-A reductase inhibitors and asked to identify 10 patients that received a prescription for any one of these drugs one year ago and to establish these patients’ HMG Co-A reductase refill histories over the subsequent 12 month period. Students and preceptors were asked to use the report functions of the in-house pharmacy computer systems to generate chronological lists of HMG Co-A reductase prescriptions to identify patients and, where this was not possible, to manually search the paper prescription records. The manual option was based on the assumption that HMG Co-A reductase prescriptions are common and would be easy to find. Each student was asked to determine the proportion of the 10 patients that they thought were compliant with therapy and to discuss possible reasons for non-compliance, strategies to improve compliance, and legitimate reasons why patients might stop anti-lipemic therapy.

Module 5: Disease State Management. Module 5 was planned to introduce students to disease state management (DSM) and to show that DSM can be conducted in a community pharmacy in the absence of diagnostic information. The problem of under-utilization of angiotensin-converting enzyme (ACE) inhibitors in the treatment of congestive heart failure (CHF) has been well described(11-15) and it’s known that digoxin and furosemide prescribed in combination has a 94 percent positive predictive value for CHF(16). Students were given the trade and generic names of all ACE inhibitors and angiotensin receptor blockers and asked to identify 10 patients receiving both digoxin and furosemide by using the report functions of the in-house computer systems and to determine the proportion of these patients that received an ACE inhibitor or an angiotensin receptor antagonist. The students were asked to find and review consensus guidelines for the treatment of congestive heart failure and to discuss why CHF sufferers might not be treated in accordance with consensus guidelines. In addition, students were asked to identify five medical conditions where there is evidence of widespread under-utilization of effective therapy and five diagnoses that can be deduced from prescription records. As described above, PHRD 3300 was run in parallel with a small group seminar course which, as one activity, required each student to make a brief presentation on an aspect of CHF to their group. The primary purpose was to provide an early experience in preparing and giving a short formal small group presentation. Little emphasis was placed on content since these were first year students without didactic education in the pathophysiology and pharmacotherapy of CHF.

Module 6: Population Health. Module 6 was planned to introduce students to population health issues and the responsibility of pharmacists to recognize individuals who may have an unidentified medical problem and to encourage them to come forward for evaluation, diagnosis and treatment. Medication-induced headache (MIH), a condition in which migraine and other headache disorder patients use analgesics and other drugs that paradoxically increase the frequency and severity of headache, was chosen as an example of a medical problem that has a high prevalence and that pharmacists are well placed to identify(17-20). The students were provided with information about MIH and its identification by medication overuse(21). They were asked to identify 10 patients with prescription records for a 5HT3 receptor agonist (i.e. 10 patients with evidence of migraine) and to assess the medication profiles of these patients for patterns of medication use consistent with MIH(21). In addition, as part of the PHRD 3200 seminar course, each small group of students was required to create a poster suitable for use in a pharmacy to educate patients about MIH and to encourage patients with concerns about MIH to seek help and advice. The purpose of this exercise was to show that pharmacists can create and participate in public health education activities. Each small group judged all of the other groups’ posters using a marking rubric (Appendix B). The group that produced the highest rated poster was rewarded with a pizza lunch hosted by the course director.

Grading Policy

PHRD 3300 was a pass/fail one credit hour course. To receive a passing grade each student was required to satisfactorily complete all of the prescribed activities within specified time frames including the creation and maintenance of their portfolio, the submission of her/his workload statistics to the Office of Experiential Programs, and her/his evaluations of the course and her/his preceptor. The preceptors were provided with a student/course assessment form but the decision to pass or fail a student was the course director’s responsibility based on the portfolio and the preceptor and portfolio assessments. Attendance was mandatory though students were permitted to undertake the practical components of the modules outside the scheduled class time (provided the preceptor approved and the activity occurred before the small group seminar discussion).

EVALUATION

Workload Statistics

The class workload statistics for the six modules are presented in Table II. They represent a substantial patient-focused effort at a level appropriate for first year students in an entry-level PharmD program, and work useful to preceptors. The students protected the health of patients by finding 225 expired pre-

Table II. Class workload statistics

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<thead>
<tr>
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</thead>
<tbody>
<tr>
<td># products examined</td>
<td>10361</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td># products found expired</td>
<td>255 (2.5%)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td># telephone numbers dialed</td>
<td>1914</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td># conversations with patients</td>
<td>524 (27.4%)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td># telephone numbers dialed</td>
<td>1468</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td># conversations with patients</td>
<td>424 (28.9%)</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td># patient profiles tracked</td>
<td>1582</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td># judged compliant</td>
<td>566 (35.8%)</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td># probable CHF patients identified</td>
<td>721</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td># treated with ACE inhibitor</td>
<td>461 (63.9%)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td># migraine patients identified</td>
<td>846</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td># potential MIH patients identified</td>
<td>369 (43.6%)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Seminar discussions were useful to understand General Evaluation and their analyses were not always validated. Reported, particularly for Modules 4 and 6, should be judged opportunities for them to resolve similar problems. The problems expected that future experiential courses will provide opportu-

sionally, in a telephone reminder and call-back program. In addition, through quality assurance programs in Modules 4 - 6, they identified for their preceptors substantial numbers of patients with potential problems related to compliance, disease state management, and population health. The students were not asked to resolve the drug-related problems identified in Modules 4 - 6 but, as their skills and knowledge increase, it is expected that future experiential courses will provide opportunities for them to resolve similar problems. The problems reported, particularly for Modules 4 and 6, should be judged cautiously because the students were responsible for data interpretation and their analyses were not always validated.

Table III. Student perceptions

<table>
<thead>
<tr>
<th></th>
<th>Strongly agree</th>
<th>Agree</th>
<th>Neutral</th>
<th>Disagree</th>
<th>Strongly disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preceptor and staff were friendly</td>
<td>73%</td>
<td>19%</td>
<td>7%</td>
<td>1%</td>
<td>0%</td>
</tr>
<tr>
<td>Preceptor was informed about the modules 41%</td>
<td>36%</td>
<td>12%</td>
<td>5%</td>
<td>3%</td>
<td>7%</td>
</tr>
<tr>
<td>Preceptor provided orientation to conduct modules</td>
<td>62%</td>
<td>29%</td>
<td>8%</td>
<td>3%</td>
<td>0%</td>
</tr>
<tr>
<td>Discussions with preceptors were useful</td>
<td>58%</td>
<td>25%</td>
<td>16%</td>
<td>1%</td>
<td>1%</td>
</tr>
<tr>
<td>Seminar discussions were useful to understand competencies required to practice pharmacy</td>
<td>12%</td>
<td>18%</td>
<td>40%</td>
<td>18%</td>
<td>12%’</td>
</tr>
<tr>
<td>Course met expectations</td>
<td>11%</td>
<td>32%</td>
<td>29%</td>
<td>19%</td>
<td>0%</td>
</tr>
</tbody>
</table>

73 of 91 students reporting.

Table IV. Student and preceptor perceptions about average time available to discuss the modules

<table>
<thead>
<tr>
<th></th>
<th>&lt; 5 minutes</th>
<th>5-15 minutes</th>
<th>16-30 minutes</th>
<th>31-60 minutes</th>
<th>&gt; 60 minutes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Students reporting: average time spent with preceptor</td>
<td>11%</td>
<td>45%</td>
<td>30%</td>
<td>7%</td>
<td>7%</td>
</tr>
<tr>
<td>Preceptors reporting: average time spent with student</td>
<td>6%</td>
<td>41%</td>
<td>27%</td>
<td>22%</td>
<td>3%</td>
</tr>
</tbody>
</table>

73 of 91 students reporting; 63 of 91 preceptors reporting.

Table V. Student and preceptor appropriateness and usefulness ratings per module

<table>
<thead>
<tr>
<th>Students:</th>
<th>Module 1</th>
<th>Module 2</th>
<th>Module 3</th>
<th>Module 4</th>
<th>Module 5</th>
<th>Module 6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes - module was appropriate for a first year pharmacy student</td>
<td>67%</td>
<td>53%</td>
<td>44%</td>
<td>61%</td>
<td>46%</td>
<td>62%</td>
</tr>
<tr>
<td>Preceptors:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes - module was appropriate for a first year pharmacy student</td>
<td>78%</td>
<td>67%</td>
<td>62%</td>
<td>70%</td>
<td>52%</td>
<td>48%</td>
</tr>
<tr>
<td>Preceptors:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes - module was useful to me</td>
<td>65%</td>
<td>67%</td>
<td>57%</td>
<td>56%</td>
<td>38%</td>
<td>46%</td>
</tr>
</tbody>
</table>

73 of 91 students reporting; 63 of 91 preceptors reporting.

scription products for their preceptors, and contributed to health outcomes through contact with 524 and 424 patients, respectively, in a telephone reminder and call-back program. In addition, through quality assurance programs in Modules 4 - 6, they identified for their preceptors substantial numbers of patients with potential problems related to compliance, disease state management, and population health. The students were not asked to resolve the drug-related problems identified in Modules 4 - 6 but, as their skills and knowledge increase, it is expected that future experiential courses will provide opportunities for them to resolve similar problems. The problems reported, particularly for Modules 4 and 6, should be judged cautiously because the students were responsible for data interpretation and their analyses were not always validated.

General Evaluation

Student and preceptor feedback on general aspects of the course and student evaluations of preceptors and course are presented in Tables III, IV and V. The results show, with few exceptions, that the students were welcomed at their practice sites, that they received the necessary orientation to conduct the modules, and that they believed the discussions with their preceptors were useful (Table III). The data also indicate that some students perceived their preceptors to be uninformed about the modules. Contributing factors included instances where the module timetable conflicted with staffing schedules (i.e., the student and preceptor were not at the site at the same time), preceptor resignations and transfers to other practice sites, and preceptors losing or failing to read the course syllabus. The course director attempted to minimize some of these problems prior to the start of the course by holding module orientation and information-sharing meetings. However, only six of the 91 preceptors were able to attend these meetings.

It was encouraging to find that some preceptors were prepared to commit large amounts of time to their students (Table IV) including at least one preceptor who took time out from their day off. However, at the other extreme, some preceptors and students spent very little time (< 5 minutes per week) discussing the modules. A likely explanation for the restricted time involvement is that these were busy sites but, whatever the reason, sites unable to provide adequate time for students are unsuitable for this course.

It was expected that not all students would be able to fully discuss the modules with their preceptors every week. The small group seminar discussions were designed, at least in part, as a further opportunity to discuss the modules and the professional and general competencies tested by the modules. However, student responses (Table III) show that the small group discussions did not link the modules to the competencies as well as intended. The reasons for this are unknown but are likely linked to the relatively short time available for the seminar discussions, logistical problems associated with holding meetings between the course director and teaching assistants prior to each PHRD 3200 small group seminar class, and the difficulty of acquiring student feedback during the course. Group meetings between all Fall 1999 course directors and first year class student leaders were held throughout the semester to quickly identify and possibly address problems with the
new curriculum. PHRD 3300 issues were identified by this mechanism but the difficulty of using the small group discussions to effectively relate the students’ activities and experiences to the competencies required to practice pharmacy was not identified until after the course finished.

The students’ opinion on the global rating item of whether or not the course met their expectations was varied with significant numbers of students responding in all five categories from “strongly agree” to “strongly disagree” (Table III). The explanation for this finding is likely based in the opinions of the students about the individual modules which generally fell into two categories broadly defined as the negative “too simple” or “too challenging” and as the positive “interesting, informative, challenging, and rewarding” (see below). It’s also likely that the finding was influenced by some students’ opinions that one credit was insufficient for the course work required, the small amount of time that some preceptors were able to give to their students, and the lack of knowledge by some preceptors about the modules. Overall, we are encouraged by the 1999 AACP Distinguished Pharmacy Educator award recipient’s opinion that normally distributed student perceptions of teaching should be sought and that 15-20 percent of students should think that too much is being expected of them(22).

Evaluation of the modules

The evaluation of module appropriateness by preceptors and students is presented in Table V. The approval ratings from students ranged from 44-67 percent (mean 56 percent) and, in all but one case, were lower than the preceptor approval ratings which ranged from 48-78 percent (mean 63 percent). The preceptors’ evaluation of the modules usefulness to them ranged from 38-67 percent (mean 55 percent). Few preceptors and students took the opportunity to submit comments with their course evaluation forms. However, the students were required to include reflective comments in their portfolios and these provided insight into their thoughts, and their preceptors’ thoughts, about the modules. The most positive and negative comments about each module were abstracted from each portfolio and were used as the primary basis for the following evaluation. The school also conducted evaluations on all Fall 1999 courses including focus group sessions but these did not add to the insight provided by the portfolios.

Module 1 (expiry dates) received the highest overall summed appropriate/useful rating from preceptors and students, and the majority of reflective comments expressed in the portfolios were positive. As an example, one student wrote “Module 1 provided me with a valuable first-time experience working in a community pharmacy setting. It was informative and non-intimidating. Although I completed the majority of this module under minimal supervision, it was also important that I discussed issues with my preceptor.” The response to the required confidence interval calculations was noteworthy. Some students stated that the confidence interval calculations could not be completed because they found zero expired products whereas other students in the same situation exercised a higher form of problem-solving/critical thinking and transferred the mathematical exercise to the products they found about to expire (<3 months).

Negative comments came primarily from students who had experience working as pharmacy technicians and saw no new learning opportunities in the module though many of them stated that the module was appropriate for students without prior pharmacy experience. Some students felt that 100 products were too many to examine, and one reported that her preceptor had asked her to examine the entire inventory (approximately 1000 products). A third of the preceptors stated that the module was not useful. The most likely reason to account for this minority opinion is that some pharmacies have routine procedures for identifying out-dated products.

Module 2 (telephone reminder system) tied with module 4 with the second highest summed appropriate/useful rating from preceptors and students and, again, the majority of reflective comments expressed in the portfolios were positive. As an example, one student wrote “This module allowed me to work on my communication skills. I was incredibly nervous before I talked to the first person on the list but then it got much easier as I got going. My communication with patients needs to be smoother but I’m sure that will come with time.” Another student wrote “The positive feedback from the patients proved to me that this type of activity can help pharmacists make a significant impact in increasing patient compliance.” Some students who expressed an understanding of the value of telephone reminder systems demonstrated a high level of cognitive thinking by challenging the practicality of such programs, in the absence of automation, on the grounds of workload and poor return on investment. Some pharmacies had a large number of uncollected prescriptions which led to a large number of telephone calls: this module will be restricted to approximately 20 telephone calls in future.

Negative comments came primarily from students who had experience as pharmacy technicians talking to patients. Other students expressed concern that the exercise was time-consuming, especially since most calls were not answered or were answered by someone other than the patient or by an answering machine. A small number of students stated that they felt uncomfortable trying to answer questions posed by patients during the telephone conversations, that they were discouraged by their preceptors from making the telephone calls, that telephone reminder programs are intrusive (unethical), and that some patients were not pleased to receive unsolicited phone calls.

Module 3 (telephone call-back program) was the least popular module with the students. However, similar to all other modules, the majority of reflective portfolio comments were positive. Examples included “I talked to three patients who had an adverse drug reaction and my preceptor counseled them. I feel I contributed to the patients’ health outcomes in a small way” and “I enjoyed the opportunity to talk with patients about their medications. It was a good experience and I found out that I knew a lot more than I thought I did. I was able to answer all the questions that came up” and “The module left me with greater empathy toward patients and their health care needs” and “Patients seemed very receptive to being called at home and were eager to discuss their medical conditions, medications, and concerns.” As with Module 2, some students demonstrated higher thinking skills in questioning the practicality of call-back programs in light of the inefficiency in contacting patients by telephone.

The primary student concern with Module 3 was that they felt unprepared to answer patients’ questions even though they were instructed to refer patient questions to a pharmacist. Student comments included “I don’t think this module is appropriate because we don’t know anything about drug interactions or side effects. I knew I could refer questions to my preceptor but I felt I was bothering him” and “I felt very unprofessional calling patients up and asking for questions that I
couldn’t answer. It required lengthy explanations for patients to understand why I had interrupted their day only to put them on hold when they had questions.” A second common complaint was the frustration of only finding a minority of patients at home to talk to the students (see Module 2). A number of students reported instances in which patients were alarmed by the telephone call. One student wrote “Patients were left confused and concerned. Even with the scripted introduction and the statement that this was a courtesy call, patients were still worried that something might be wrong.” Again, similar to Module 2, some students were discouraged by their preceptors from making the telephone calls. One student wrote “The preceptor was not thrilled with this exercise. He felt it was an invasion of privacy.”

Module 4 (HMG Co-A reductase refill history) had the joint second highest summed appropriate/useful rating from preceptors and students. Again, the majority of reflective comments expressed in the portfolios were positive and included “There and then I decided that I will be calling up patients taking these and other kinds of maintenance meds when I’m a pharmacist” and “This module was educational. From what I observed, there is a significant compliance problem with anti-lipemic therapy” and “I took it upon myself to learn what the medication did and why it is used” and “The module gave an opportunity to interpret patient profiles. It was fun and educational” and “I really enjoyed this module and thought it was very appropriate. I felt I could actually apply what I learned in the pharmacy to what we do in school instead of vice versa all the time.”

The primary student concern with Module 4 was the technical challenge of using the pharmacy computer databases to generate lists of patients receiving an HMG Co-A reductase inhibitor. There are multiple computer software systems in use in pharmacies in the Denver area and it was judged impractical to provide operating instructions to generate the required lists for each of these different systems. Also, it was recognized that some preceptors may be unfamiliar with the use of their system to generate computerized lists of drugs and that this operation can be time consuming and can reduce the speed of concurrent computer operations. Accordingly, it was intended that the preceptors would generate the lists at a convenient time prior to their student’s arrival but, judged by the comments, that was not always done. Contrary to the student who took advantage of the opportunity to self-learn about anti-lipemic therapy, some students expressed the thought that information about the pharmacology of HMG Co-A reductase inhibitors and their therapeutic use should have been provided as part of the module. Some students appeared not to grasp the importance of monitoring and optimizing compliance and stated that the module bore no relationship to their future careers as pharmacists.

Module 5 had the lowest summed appropriate/useful rating from preceptors and students. It was scored the least useful module by the preceptors which suggests that preceptors are not routinely conducting this form of quality assurance program and may not appreciate its potential value to their patients. However, again, a large majority of the reflective student comments expressed in the portfolios were positive and included “This module showed that pharmacists can directly impact patient care. It just might save someone’s life!” and “This module made me realize how important it is to be current on the most recent research” and “The module taught me about CHF. I had the opportunity to explore pharmacy in depth - the type of pharmacy education and training that exceeds counting and dispensing. This is the beginning of the new and more in-depth role of contemporary pharmaceutical care.” Positive comments were also expressed about the small group presentations. These included “The presentations gave me a greater understanding of the drugs used to treat CHF and why they are given together” and “The presentations were the most beneficial aspect of this module” and “Short presentations could be coupled with each module.” However, the comments suggest that the students were more interested in acquiring didactic knowledge about CHF rather than in testing and improving their communication skills.

The primary student concerns with Module 5 were the time consuming technical challenge of using a pharmacy computer database to generate lists of patients receiving specific drugs (as with Module 4) and their lack of knowledge about CHF and its pharmacotherapy. Some students reported that their preceptors lacked knowledge about consensus CHF treatment guidelines and the mechanism of action of drugs to treat CHF.

Module 6 (population health) was the one module that had a higher student rather than preceptor rating possibly because the students enjoyed the poster assignment. Positive comments on the assignment included “The poster competition was good because we got to see different ideas. The better posters definitely could be used as a community service.” and “I can use the poster idea in the future when I’m a pharmacist.” Positive general comments about the module included “All the ability-based outcomes listed in the module description were tested, particularly critical thinking and decision-making” and “I felt that the module presented pharmacy in the manner that interests me” and “This module reinforced the idea that pharmacists can play a pivotal role by asking appropriate questions. This module reinforced my commitment to my chosen career.”

The primary student concerns with Module 6, as with Module 4 and Module 5, were the time needed to complete the module and the frustration encountered in abstracting the necessary information from some of the computer systems. In addition, not all students appreciated the poster requirement. Negative comments included “The poster requirement was a waste of time for a pass/fail course” and “Working on the floor with scissors, paper and glue appealed to some students more than others.” Concerns about preceptors’ MIH knowledge base were expressed.

The classroom-based presentations about independent and chain community pharmacy and managed care pharmacy were well received by the students with approval ratings ranging from 74 - 78 percent. The reflective comments expressed in the portfolios were almost unanimously positive and included “The panel gave a wonderful insight into independent pharmacy and its advantages and disadvantages. I concluded that they have had great happiness, joy and satisfaction as independent pharmacists” and “We need more seminars like this” and “The NACDS presentation was eye opening: I’m glad it was given” and “It was interesting to learn where the pharmacy profession is going” and “This was a wonderful overview of managed care for a new pharmacy student” and “This seminar was well worth my time to sit and listen to.” The interest of the students in these presentations was also demonstrated by their sustained questioning of the speakers at the end of the formal (1-2 hour) presentations.
PROPOSED MODIFICATIONS

PHRD 3300 will be separated from the parallel seminar program in the Fall 2000 semester because the students found linking the two courses to be confusing. This resulted in the small group seminars not being sufficiently effective in allowing the students to discuss their experiences and link them with the professional and general competencies required to practice pharmacy, which was a primary objective of the course. Accordingly, PHRD 3300 will now be a stand-alone course. It will commence with one orientation session and the 3 classroom-based presentations (placed early in the semester to give time to match the students with their experiential sites) and then alternate the students on a weekly basis between their pharmacy practice sites and full-class meetings in the school. The full-class meetings will provide more time to de-brief the students on their findings and experiences, and allow this aspect of the teaching to be conducted by a faculty member. It is expected that this format will improve the students’ ability to relate their experiential training to the course objectives. In addition, it will allow an orientation to be given the week before each module is undertaken rather than an orientation to all modules at the start of the semester. The function of the teaching assistants to mark and provide feedback on the student portfolios was valuable and will be retained as will the small group CHF presentations for Module 5 and the MIH poster requirement for Module 6.

Module 3, the telephone call-back program, will be eliminated. The introduction of the alternating weekly format for classroom and practice site activities necessitates one less module because of timetable issues. In retrospect, Module 3 is better suited to students with a greater therapeutic knowledge base and it addresses no professional or general pharmacy competency not encountered in the other modules. In addition, new practice sites and preceptors will be sought to replace those that had restricted opportunities to spend time and discuss issues with their students and those that were opposed to the goals and objectives of the course. For the preceptors that continue to teach this course, it is expected that their experience with the program will reduce some of the students’ frustration associated with generating the required computer lists. The course director will make additional requests to the preceptors to generate these lists (or to identify patients by other means) ahead of time. As the new program develops, it is expected that first year students in experiential training will benefit from supervision by senior students.

SUMMARY AND CONCLUSIONS

A first year, first semester experiential course designed to introduce students to patient care and the professional and general competencies required to practice pharmacy has been successfully implemented. The course has confirmed that, at a level appropriate to the year of their program, first year pharmacy students can contribute to patient care and demonstrate the professional and general competencies required to practice pharmacy. The course has also confirmed that first year pharmacy students can undertake work viewed as valuable by their preceptors and that senior students are effective and beneficial in the instruction and evaluation of junior students. The student portfolios and the student and preceptor course evaluations have identified strengths and weaknesses in the course and, in addition, they have provided benchmark data with which to judge the impact of the proposed module changes in improving the course.

Acknowledgement. The authors acknowledge the participation of the students of the Class of 2002 who were enrolled in PHRD 3200.

References

(10) Reddick J.B. and Murphy, J.E., “Evaluating the clinical interventions of students during clerkships using a cognitive services claim form,” ibid., 64, 38-43(2000).

APPENDIX A. PORTFOLIO EVALUATION (PHRD 3300): ASSESSMENT RUBRIC TYPED

Typed

EXCEEDS: The module product is neatly typed. Information is concise and written in a style which is easy to read and understand, and shows a strong command of the English language. There are no noticeable corrections or erasures. There are no spelling or grammar errors.
MEETS: The module product is typed. Information is mostly concise but some areas require editing. The style is readable and understandable for the most part. The meaning of some sentences is unclear or open to misinterpretation. There are a few noticeable corrections or erasures. There are a few spelling or grammar errors.

MEETS WITH LIMITATIONS: The module product is typed but with more than a few noticeable corrections or erasures. There are more than a few spelling or grammar errors. The style is readable and understandable for the most part but the meaning of some paragraphs is unclear or open to misinterpretation.

FAILS TO MEET: The module product is not typed or has many noticeable corrections and/or erasures. The number of spelling and grammar errors is large enough to interfere with the sensibility of the writing. The style is difficult to read. Large parts of the module product are difficult to understand or open to misinterpretation.

PROFESSIONAL IMAGE
EXCEEDS: The first impression of the portfolio is one of excellence. The presentation is impressive and indicates that the student has an advanced command of a word processing program. The portfolio is highly organized and user-friendly. The module product was completed and turned in for grading on time.

MEETS: The first impression of the portfolio is favorable. The presentation is good and indicates that the student has more than a rudimentary command of a word processing program. The portfolio is organized and semi user-friendly. The module product was completed and turned in for grading on time.

MEETS WITH LIMITATIONS: The first impression of the module is not completely favorable. The presentation indicates that the student has only a rudimentary command of a word processing program. The portfolio is organized but not user-friendly. The module product was not completed and turned in for grading on time.

FAILS TO MEET: The first impression of the module is not favorable. The presentation indicates that the student has very little command of a word processing program. The reader lacks confidence that reasonable care and attention has been given to the portfolio. The portfolio shows little or no organization. The module product was not completed and turned in for grading on time.

ORGANIZATION
EXCEEDS: The portfolio entry is well organized and structured in an easy to follow format. The organization is logical and sequential, and consistent from exercise to exercise.

MEETS: The portfolio entry is organized and structured in a format that can be followed without too much difficulty. Except for occasional sections, the organization is logical, sequential and consistent from exercise to exercise.

MEETS WITH LIMITATIONS: The portfolio entry is not organized properly. It is difficult to follow in parts. Several sections are not logical, sequential & consistent from exercise to exercise.

FAILS TO MEET: The portfolio entry is poorly organized, confusing, and difficult to follow. Many sections are not logical and sequential. There is no consistency from exercise to exercise.

BREADTH AND DEPTH
EXCEEDS: The portfolio entry is comprehensive and contains pertinent material beyond that required by the module. The student shows a detailed insight into pharmacy practice.

MEETS: The portfolio entry covers all the material required by the module. The student shows some insight into pharmacy practice.

MEETS WITH LIMITATIONS: The portfolio entry omits, or addresses superficially, some of the material required by the module. The student has little insight into pharmacy practice.

FAILS TO MEET: The portfolio omits, or addresses superficially, most of the material required by the module. The student shows almost no insight into pharmacy practice.

INCORPORATES SUGGESTIONS
EXCEEDS: The student incorporates all suggestions for improvement into subsequent portfolio entries and, in addition, incorporates further improvements on their own initiative. In cases where suggestions are not incorporated, the student must be able to support their decision.

MEETS: The student incorporates all or most suggestions for improvement into subsequent portfolio entries. In the few instances where a suggestion has not been incorporated, the student can provide no more than a poor (partial or unconvincing) defense to support their decision.

MEETS WITH LIMITATIONS: The student incorporates some suggestions for improvement into subsequent portfolio entries. The student can provide no more than a poor (partial or unconvincing) defense to support their decision.

FAILS TO MEET: The student incorporates none or only a few suggestions for improvement. The student provides very little or no defense to support their decision.

APPENDIX B. CRITERIA FOR JUDGING A POSTER

1. CLARITY OF PURPOSE
Above average (8-10 points): the poster uses language that can be quickly and easily read and understood by a layperson. It leads the reader through a logical triage system with specific criteria for MIH or migraine. The poster has easily followed precise action steps for patients with symptoms consistent with MIH or migraine.

Average (4-7 points): the poster uses language that can be read quickly by a layperson but needs to be read more than once to be properly understood. It leads the reader through a triage system with criteria, some of which are specific, for MIH or migraine. The poster gives non-specific advice to patients with symptoms consistent with MIH or migraine.

Below average (1-3 points): the poster uses language that cannot be easily read and understood by a layperson. It needs to be read more than once to be properly understood. It can be quickly glanced by a layperson but needs to be read more than once to be properly understood. It leads the reader through a triage system with criteria, some of which are specific, for MIH or migraine. The poster gives non-specific advice to patients with symptoms consistent with MIH or migraine.

2. OVERALL PRESENTATION
Above average (8 - 10 points): the poster is eye-catching and draws attention. It is an appropriate size and the choice of font and font size ensure that the poster can be read from a distance. The poster is made of high quality durable material.

Average (4 - 7 points): the poster is well prepared but is not likely to stand out from other information normally on display in a pharmacy. The poster is made of material that will wear.

Below average (1 - 3 points): the poster is unlikely to stand out from other information normally on display in a pharmacy. It is so small that it is insignificant or too large to be practical. The choice of font and font size make the poster almost unreadable. The poster is made from poor quality material and is unprofessional in appearance.

3. GRAPHIC DESIGN
Above average (8 - 10 points): the poster uses graphic design including images, color and manipulation of fonts that make the poster appear to have been created by a professional artist.

Average (4 - 7 points): the poster incorporates images, color and manipulation of fonts which demonstrate mastery of computer software but the overall impression of the poster is functional rather than artistic.

Below average (1 - 3 points): the poster does not use images, color and manipulation of fonts.