

Strategies and Processes to Design an Integrated, Longitudinal Professional Skills Development Course Sequence¹

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A longitudinal course sequence, "Professional Skills Development," was developed as part of a new entry-level PharmD curriculum to aid assessment and student achievement of ability-based outcomes. The sequence emphasizes a patient-centered context for basic and clinical sciences, pharmacy practice principles, pharmaceutical care provision, and professional development. Implementation strategies for the first two semesters included: (i) horizontal integration of concurrent course material using multiple faculty from different disciplines; (ii) vertical, reinforced progression of content and abilities; (iii) active learning instructional methodologies; and (iv) multiple student assessments and feedback from self, peers, standardized patients and faculty. Weekly outcomes, mapped to course and curricular outcomes, guided design of activities and assessments. Student, faculty, and administrative response to the sequence has been positive. The instructional strategies and course design processes may serve as models for other schools.

INTRODUCTION

In the last three decades, the focus of the pharmacy profession has evolved from the preparation and distribution of pharmaceutical products to the provision of pharmaceutical care(1-3). Much has been written and discussed about the need for renewal in pharmacy education to reflect these changes(4-9). Related literature recommends development of ability-based, entry-level Doctor of Pharmacy (PharmD) degree programs focused on achievement of educational outcomes(10-12). Additionally, this literature suggests that pharmacy education needs to facilitate students' integration of knowledge, skills and attitudes from various disciplines that serve as the basis of pharmaceutical care. Recently revised accreditation standards for schools and colleges of pharmacy also support these recommendations and will require compliance by 2005(13).

As schools and colleges of pharmacy work to create and implement entry-level PharmD degree programs, there is opportunity for complete revision of previous Bachelor of Science and Doctor of Pharmacy curricula. Although labor-intensive, many faculties have taken this opportunity to devel-

op model PharmD programs that will meet the revised accreditation standards and help prepare students to practice pharmaceutical care. The faculty of the University of Colorado Health Sciences Center School of Pharmacy (CUSOP) have worked diligently the last few years to create such a program. The resulting curriculum, implemented in the Fall of 1999, was designed as an integrated, ability-based entry-level PharmD degree program. This paper describes a required longitudinal course sequence in this new program, "Professional Skills Development (PSD)," that serves as the backbone of the curriculum and as a primary source of ability-based, integrated education.

METHODS

During the process of curricular revision, the CUSOP faculty adopted a set of general and professional ability-based out-

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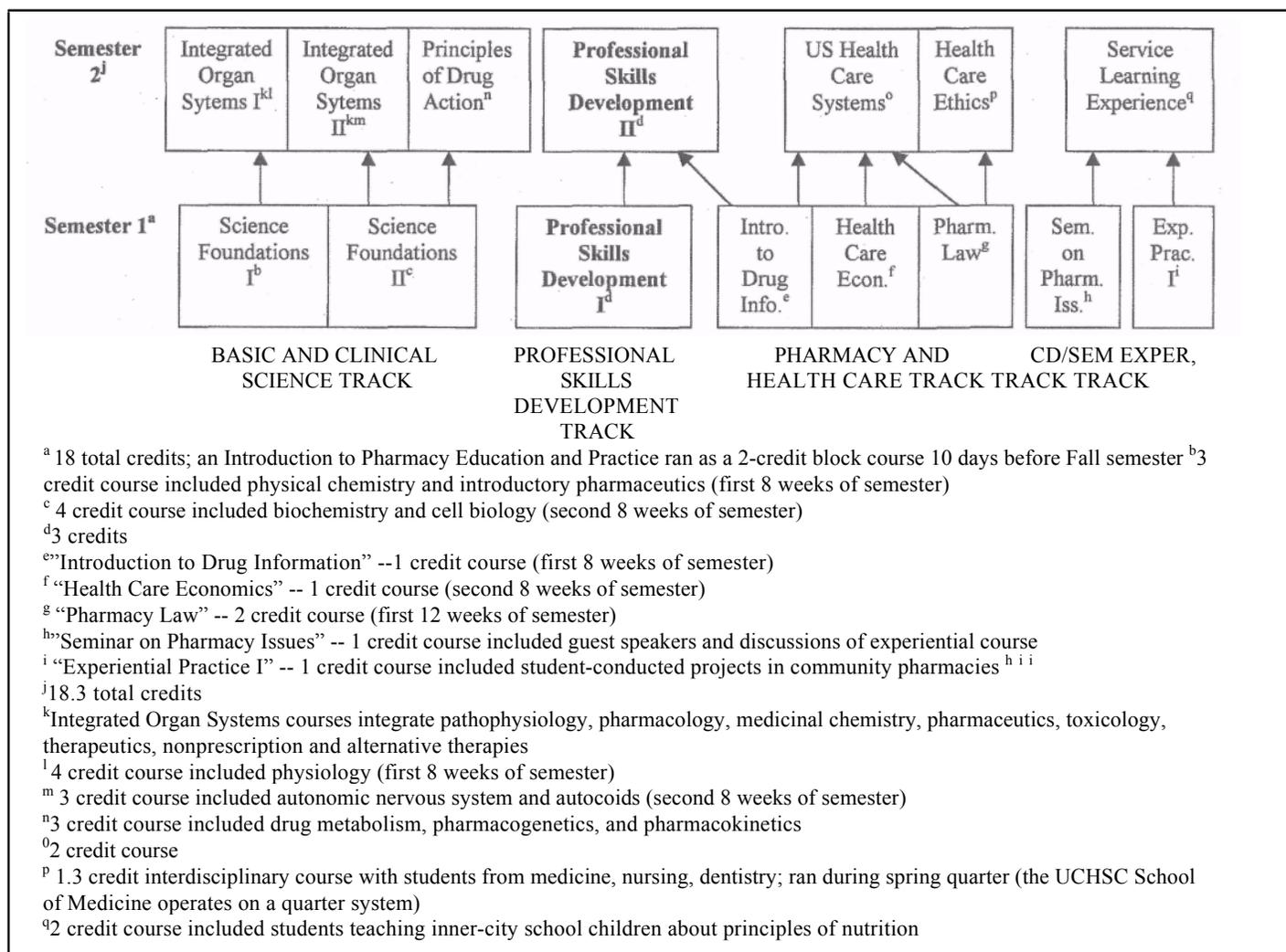


Fig. 1. First year curriculum of entry-level doctor of pharmacy degree program at the University of Colorado Health Sciences Center School of Pharmacy.

comes (based on the AACP-CAPE outcomes) to guide development of the new program (Appendix A)(14). These outcomes are currently being defined in terms of progressive levels of development, and as such, are a work in progress. To facilitate development and achievement of these outcomes, the curriculum was constructed as a set of "tracks" that run longitudinally through the three-year didactic portion of the program. Various interdisciplinary teams of faculty have worked and are continuing to work to design these tracks of courses. The five tracks represent: (i) integrated basic and clinical sciences; (ii) pharmacy and health care; (iii) experiential learning; (iv) career development/seminar; and (v) professional skills development. The first year of the revised curriculum is shown in Figure 1.

The Professional Skills Development sequence was a track in the previous post-baccalaureate/"track-in" PharmD program and served as the "laboratory" portion of a pharmacotherapeutics course sequence in the last didactic year of that curriculum. This lab-course sequence served as the basis for the new sequence that would be incorporated into the first five semesters of the entry-level PharmD program. Instructional methods used in the former sequence, such as integrating and applying didactic course content, hands-on learning of clinical skills, and problem-solving using complex patient case studies, were retained and expanded in the new sequence.

Course Outcomes

The newly-adopted general and professional outcomes were reviewed to determine which would be best developed in the PSD sequence. It was determined to focus on the general set of abilities for the first year of the sequence at the introductory and developmental levels. Thus, the first two semesters' course outcomes focused on communication, teamwork, problem-solving, self-assessment, professionalism, and integration/application of knowledge in the context of pharmacy practice and pharmaceutical care. These outcomes are listed in Appendix B.

In addition, module outcomes were created for each week's course activities. Each activity was mapped to a module outcome(s), each module outcome was mapped to a course outcome(s), and each course outcome was mapped to the School's set of general outcomes (Appendix C). This process helped to establish a framework to document student achievement (or lack thereof) of curricular outcomes.

Course Philosophies

It was determined that the course sequence would be operationalized based on the educational philosophies of mastery learning and assessment-as-learning. Mastery learning is demonstrated as individual students achieve the outcomes and

competencies of a particular course or project. If they can demonstrate such achievement, then they earn the “grade” associated with that achievement. By contrast, courses that operate using a “norm-referenced” philosophy compare an individual student’s achievement to other students’ achievements and attempt to create a normalized distribution of students based on their level of achievement. Thus, many norm-referenced graded courses have bell-shaped distributions of students’ grades while many mastery learning-graded courses may have large numbers of students on the higher end of the grading scale, similar to graduate-level courses.

Assessment-as-learning is a concept originally described by Alverno College(15). It incorporates the notion that feedback provided to students regarding their performance on a particular exercise, for example, helps them to determine their strengths and weaknesses in relation to that exercise so that they can improve performance when reassessed. The concept can also be interpreted to mean that the assessment methods associated with a particular course or project will “drive” the manner in which students learn - especially in a graded system. For example, if a course utilizes performance on knowledge-based exams as the primary method of assessment of student learning, then students can be expected to memorize and regurgitate the knowledge on which they are being tested. By contrast, if a course assesses students’ learning using performance on knowledge-based exams in addition to writing papers, making oral presentations, or participating in class discussions, then students could be expected to memorize and regurgitate knowledge, write content relevant, grammatically correct papers, make effective oral presentations or actively participate in class discussions. In other words, students will usually perform in the manner in which they are incited.

Course Design Strategies

In determining how the course should be designed, the previously described course outcomes and philosophies were reviewed to help identify specific strategies that could be used. Communication with faculty colleagues who were in the design phase of concurrent courses also helped to clarify course design methods that would be utilized for the PSD sequence. Specifically, it was determined that the courses would be created using four strategies: (i) horizontal integration of concurrent course material using multiple faculty from different disciplines; (ii) vertical progression of course content and abilities; (iii) instructional methods involving active learning; and (iv) multiple student assessments and feedback from self, peers, standardized patients and faculty.

Horizontal Integration. Horizontal integration was achieved by contacting course directors of concurrent fall and spring semester didactic courses and obtaining copies of their syllabi. These directors were asked to identify foundational concepts from their courses that, historically, students had the most difficulty understanding and applying. Additionally, they were asked to identify content from their courses that they felt could be incorporated into active learning exercises. Professional Skills Development course activities were then created in cooperation with these faculty members so that students would participate in them at the same time they were learning the foundational content in the concurrent course. These activities utilized the concurrent course’s content in the context of patients and pharmacy practice. In several instances, these faculty colleagues helped to lead the related activities in the

Professional Skills Development course.

For example, as students were learning neurophysiology in Integrated Organ Systems I, the faculty member teaching that content created patient-related neurophysiology questions regarding Multiple Sclerosis and Parkinson’s Disease. Students worked on the questions in their assigned groups, then presented select responses to other student groups. The neurophysiology faculty member attended the students’ presentations to assure that students had answered the questions accurately. Following this activity, two ambulatory patients (one with Parkinson’s Disease and the other with Multiple Sclerosis) visited the class to share their disease-related experiences. The students had an opportunity to “interview” the patients and ask specific questions related to the patients’ experiences. This portion of the activity also helped increase student awareness of social-behavioral issues associated with these patients.

Vertical Progression. Vertical progression is an important educational strategy to help reinforce students’ learning of content and skills and development of abilities throughout a professional program. For the PSD sequence, vertical progression in the five consecutive semesters was developed by first identifying those concepts and abilities that: (i) helped students achieve the School’s curricular outcomes; (ii) reinforced students’ learning of principles of pharmacy practice; and (iii) complemented other courses in the curriculum. These concepts and abilities are described in Appendix D.

Course activities were then designed to support these tenets. For example, the skills involved in patient consultation were introduced and practiced by students in the first semester. Students were assessed on several occasions on their use of effective communication skills in the context of verbally consulting with an uncomplicated patient about a new prescription or non-prescription medication. In the spring semester, patient consultation scenarios were created to be more complex (e.g., patient is hard of hearing, patient’s agent picks up the medication, patient does not think he/she needs the medication). Students were assessed not only on their use of effective communication skills with the patient, but they were also held accountable for communicating accurate information to the patient.

Active Learning Instructional Methodologies. Educational literature suggests that a large variety of learning styles exist among students(16-18). Additionally, in order to develop and improve multiple abilities in students, multiple educational methodologies should be used in a given degree program. In the first two semesters of the PSD sequence, many different modes of instructional delivery were utilized. Some of these examples include group assignments (facilitated or independent), mini-lectures and class discussions, role-play simulations, computer-based assignments, informal oral student presentations, written essays, videotaped encounters, round table discussions, and laboratory exercises. Utilizing a variety of strategies in the classroom also helped to ensure that all students were able to fully participate in their learning in one form or another.

Multiple Assessments, Assessors and Feedback. It seemed natural that a course utilizing many instructional methods should also incorporate multiple assessments to assess student learning and development. It was determined that most of the

Table I. Mean levels of agreement with fall semester course assessment statements^a

Survey item	Mean ± SD ^b
1. My previous experience (<i>i.e.</i> , education, background) is sufficient for me to comprehend the material presented in this course.	3.34 ± 0.72
2. I think this course will provide me with the necessary background for future courses in the curriculum	3.21 ± 0.68
3. This course has clearly stated objectives	2.78 ± 0.76
4. It is not clear to me how topics in this course are related to each other.	2.07 ± 0.93 ^c
5. This course progressively builds understanding of concepts and principles.	3.07 ± 0.67
6. The objectives of this course are consistently pursued.	3.04 ± 0.62
7. I am able to keep up with the work load in this course.	3.24 ± 0.56
8. I am challenged by the material presented in this course.	2.80 ± 0.83
9. Graded exercises (quizzes, exams, assignments, reports, presentations, other activities) accurately assess what I have learned in this course.	3.03 ± 0.91
10. The material presented in this course is relevant to the course objectives.	3.09 ± 0.71
11. This course contributes to my professional growth.	3.37 ± 0.57
12. The information and skills learned in this course are applicable to pharmacy practice.	3.41 ± 0.76
13. The organization (<i>e.g.</i> , objectives, format, activities) of this course enables me to keep track of what I am learning.	2.85 ± 0.86
14. Graded exercises (quizzes, exams, assignments, reports, presentations, other activities) are consistent with course objectives.	3.05 ± 0.81
15. Within this course, instruction is well coordinated among the various instructors.	3.14 ± 0.81
16. Instructional methods employed in this course are appropriate to help achieve course objectives.	3.09 ± 0.76
17. Course topics are presented in sufficient depth.	3.02 ± 0.78
18. Sufficient opportunities are available for me to give feedback about the course.	3.06 ± 0.73
19. The pace of instruction in this course is: (a) too fast; (b) about right; (c) too slow.	1.94 ± 0.62 ^d
20. For the number of credit hours, the amount of material covered in this course is: (a) too little; (b) appropriate; (c) excessive.	1.89 ± 0.62 ^d

^aN = 87 - 89 respondents for each item.

^b 1 = strongly disagree, 2 = disagree, 3 = agree, 4 = strongly agree for all items except #4, 19, and 20.

^c Since this item was worded negatively as a validity measure, a lower mean should be interpreted as a more positive response.

^da = 3, b = 2, c = 1.

activities, exercises, and assignments students completed would be assessed for content, style, and/or process. "Expert" assessments were conducted by faculty, teaching assistants, or standardized patients. It was through these assessments, including paper/pencil exams, that students earned the majority of points toward their final grades. The expert assessors also provided students with feedback regarding their performance on most assessments. Additionally, students assessed their own performance or learning for certain activities; their peer group members also assessed their performance on certain activities. Self and peer assessments were conducted primarily for the purposes of self-reflection and peer feedback, respectively; some were reviewed by faculty in order to "assess the assessment." The courses used a traditional grading scheme of A-B-C-D-F.

Course Organization

The PSD sequence from the previous curriculum had been conducted as a graded, three-credit, mandatory three-hour per week, small-class format. Having determined that this organization was conducive to successful implementation of active learning strategies, it was retained in the new course sequence.

Faculty. Two faculty members, one from the School's Department of Pharmacy Practice and the other from the Department of Pharmaceutical Sciences, were appointed as co-directors for the first two semesters of the course. Ninety students enrolled in the course were divided into three sections of 30 students each. Each three-hour section met once per week for 15 weeks each semester. Three graduate teaching assistants from the Department of Pharmaceutical Sciences were

assigned to the course each semester; these TAs helped with course organization and facilitation as well as assessment of some student assignments. Other "faculty" members in the course included those previously described, several from both departments (Pharmacy Practice and Pharmaceutical Sciences), PharmD candidates participating in rotations with clinical faculty, a pharmacy practice resident, standardized patients and real patients. None of these "other faculty" members were utilized more than three times in a semester.

Facilities. Several venues were used to conduct course activities. Most sessions were held in a classroom furnished with small-group tables and chairs. Other sessions were held in a traditional pharmaceuticals lab that included several networked computer terminals. Videotaping of patient consultations with standardized patients were conducted in fully equipped standardized patient classrooms in the nearby School of Medicine.

Course Implementation

An agenda was created each week/module to guide students through the activities. These agendas included several types of information: class times and room assignments, assignments due at the beginning of class, materials to bring to class, required pre-reading and prerequisite knowledge, module outcomes, module schedule, assessments and point distributions, exit assignments, and time management. These agendas were made available to students the week before each module. An example can be found in Appendix E.

In addition to the variety of instructors and materials used in the course, two computer-based course organization pro-

grams were utilized. In the fall semester, the Microsoft Office Outlook[®] system was used to post course documents. This system allows authorized network users, such as faculty members, to create “public folders” in which to post documents. These folders can then be accessed by other network users (*i.e.*, students) to view and download materials. The course syllabus, module agendas, readings and most handouts were posted in the public folder for this course.

A more comprehensive course organization program, the Blackboard[®] system, was tested during the spring semester to determine if it was more helpful than the Outlook[®] system. Blackboard[®] allows instructors to post course documents, assignments and announcements, keep a grade book, conduct exams and surveys on-line, monitor a chat room, and implement other features of course organization. An entire course could be delivered on-line using this system. For the PSD spring course, it was used primarily to post course documents as well as conduct mini-quizzes and surveys. The primary mode of communication among students and instructors for both semesters was the university’s email system.

RESULTS AND DISCUSSION

Several course assessments were conducted with students during both semesters. Additionally, the two co-course directors regularly reminded students that feedback regarding the course was welcomed and encouraged. Anecdotal feedback was also obtained from participating faculty members and administration.

Student Feedback

In general, students enjoyed the PSD courses. Many of them had little or no experience with an active learning course format and seemed reluctant early on to fully participate in course activities. As time went on, however, more students actively participated and made more of a contribution to course activities. About half of the students had prior or concurrent pharmacy work experience; those students seemed less challenged by the pharmacy practice activities in the course. Many of those who did not have experience, however, commented how helpful it was to learn about the “real world.”

Late in the fall semester, students completed a 20-item assessment for each of their courses. Students were asked for their level of agreement (strongly agree to strongly disagree) with 18 course-specific statements and to select from multiple responses for two additional statements. Comment sections were included with each statement. Students completed corresponding Scantron[™] forms; responses were analyzed by the university’s Educational Support Service. Responses to the PSD fall semester course showed agreement with most statements (Table I).

A qualitative course assessment was conducted mid-spring semester and asked students two questions: “What is the most positive aspect of the course that you would like to see continued (*e.g.*, format, methods of instruction, appropriateness of exams/assignments/activities, time frame, etc)?” and “What aspect of the course needs the most improvement that could possibly be improved in the next eight weeks?” Frequent responses to the first question included aspects such as applicable content, small group work, use of standardized and real patients, compounding, “hands-on” activities, integration with other courses, variety of activities, weekly agendas, and fun learning environment. Frequent responses to the second question included aspects such as too many activities in time frame, inconsistency in grading, class time too long, too much work outside of class, grading too critical, and need more integration with science courses.

Faculty and Administration Feedback

Feedback received from colleagues has been very positive. Several have commented that students have demonstrated a greater understanding of the importance of basic science to pharmacy practice, are more involved in their learning as opposed to a typical memorization/regurgitation cycle, and are receiving a more comprehensive approach to pharmacy education that will help them to be better practitioners. Additionally, colleagues have commented on the value of faculty from different disciplines working together to improve students’ learning of important concepts, as well as learning different instructional techniques.

Reflections from Course Directors

Creating and implementing the first year of the PSD course sequence was bittersweet. Major challenges included the consumption of time it took to develop and maintain the course, the introduction of ability-based education to students, and helping colleagues to think about classroom instruction differently. The rewards, however, have been plentiful. The opportunity to get to know students on an individual level as well as facilitate and observe their development into professionals is very exciting. It is also very rewarding to introduce fellow faculty members to modes of classroom instruction they haven’t experienced previously and have them discover how well students respond to their course material when it is delivered in a different learning environment. Additionally, the ability to document students’ development toward curricular outcomes is proving to be a valuable aspect of the course. Finally, being able to “put into practice” many current curricular recommendations such as integration and ability-based education has proved to be very a positive and “doable” experience.

IMPLICATIONS FOR FUTURE COURSES

There were many positive aspects of the first two semesters of the PSD course sequence as well as some lessons learned. As faculty members plan for the subsequent three semesters of the course, the first year is undergoing review to determine what needs to be modified, improved, and built upon.

Facilities

Since there is no longer a traditional pharmaceuticals laboratory course, that area was remodeled during the summer of 2000 into a state-of-the-art Pharmaceutical Care Learning Center. The new center creates a professional office-like atmosphere with networked computer workstations for every two students, an instructor computer workstation, a conference/physical assessment room, a satellite drug information center, a sterile preparation room, built-in video and audio technology, a large group classroom area, and compounding, dispensing and patient consultation areas. There are also areas for storage and presentation of pharmacy products. The new facility should be ready for use in Fall semester 2000.

Faculty Manpower

Since this was the first year of implementation of the new entry-level PharmD program and this course sequence, the “faculty” described previously was able to successfully work the courses into their schedules. As subsequent years of the entry-level program are implemented, however, there will be an increasing strain on those same faculty members to deliver PSD courses concurrently in each academic year of the program. Thus, several ideas have been proposed to help faculty deliver the same quality and variety of instruction as the first

year of the sequence.

As the entry-level program evolves and the previous Bachelor of Science and “track-in” PharmD curricula are phased out, more faculty will become available to teach and direct the PSD courses. To integrate these faculty members into the course sequence, it was decided to have one of the original course directors from the first year move on with each subsequent semester and introduce other faculty members to the courses in an “overlapping” fashion; for example, one faculty member who helped with several course activities in the spring semester of the first year is now co-director for the fall semester of the second year. This plan lends continuity to each semester based on the first year’s experience, as well as provides opportunities for new faculty to become involved in the course sequence. For additional manpower in the classroom, the plan is to involve PharmD candidates participating in elective education rotations, pharmacy practice residents participating in faculty rotations, adjunct and adjunct faculty members, and practicing pharmacists. These personnel will also serve as role models for the students.

Course Content

The concepts and abilities described in Appendix D will continue to be developed in semesters three through five of the course sequence. Since most of these were introduced in the first year of the course, the plan is to “ramp them up” in subsequent semesters. More complex problems and scenarios based on these same concepts will be developed for students to work through; knowledge from their concurrent courses and information from prior courses will continue to be integrated into these activities as well. To aid comprehensive assessment of students’ learning and development of skills and abilities, the need for Objective Structured Clinical Exams (OSCEs) are being discussed to add to the series of courses.

CONCLUSION

Overall, this course sequence in a new entry-level PharmD program has helped to establish and assess ability-based education in the curriculum. The courses thus far have been positively received by students, faculty, administration and external constituents to the School. It is hoped that this kind of delivery of pharmacy education will continue to be developed and improved to help students prepare for pharmacy practice in the new millennium.

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APPENDIX A. CURRICULAR OUTCOMES AND DESCRIPTIONS FOR THE UNIVERSITY OF COLORADO HEALTH SCIENCES CENTER SCHOOL OF PHARMACY ENTRY-LEVEL DOCTOR OF PHARMACY DEGREE PROGRAM. ADOPTED, 1998.

General Ability-Based Outcomes

General abilities refer to the knowledge, skills and attitudes that make a well-rounded individual. These abilities are necessary attributes for contemporary pharmacists. When combined with pharmacy specific ability-based outcomes, they allow the graduate to become a competent, ethical and effective practitioner of pharmaceutical care.

1. Communicate using various modes of communication including people, ideas, texts, media, technology

This outcome requires each student to become a proficient and skilled communicator, a cornerstone for personal and professional effectiveness. Effective communication is essential in interactions with patients, caregivers and other health care professionals to enhance patient care and to provide pharmacy-related education to individuals, groups and the general public.

2. Think critically, solve problems and make decisions

An intrinsic quality required of health care professionals is the ability to make decisions that affect the lives of individuals. The problem solving and decision making processes require the abilities to define the problem, analyze the situation, think critically about the information available to you, select and implement a strategy to resolve the problem and evaluate the effectiveness of the decision.

3. Make value judgments and independent decisions

Personal and societal values influence the decision-making process. Implicit in this outcome is the ability to identify and analyze personal and societal values and use them appropriately in formulating decisions within personal and professional contexts. Development of this ability allows graduates to become trusted health care professionals who act with personal and

professional integrity, respecting the rights and values of patients.

4. Integrate information derived from theory, concepts and factual evidence

Implicit within the ability to solve problems and make decisions is the ability to integrate and synthesize diverse and, at times, conflicting information into a cohesive, understandable unit. This ability enhances an individual's effectiveness in addressing issues within personal and professional contexts. With the increasing complexity of drug therapy management regimens, proficiency in this ability is gaining added importance in contemporary pharmacy practice.

5. Demonstrate effective interpersonal and professional interactions

Interaction with others—patients, caregivers, other health care professionals—is a necessary part of effective pharmacy practice. Teamwork often is required to achieve desired outcomes. Achievement of this ability will provide the graduate with tools for effective interpersonal and professional interactions required of practitioners.

6. Self-assess and engage in self-directed learning

Personal growth and development require that the individual assume personal responsibility for assessing and improving him/herself through various means. A critical aspect of self-improvement and an essential component of professionalism is internalization of the learning process which allows engagement in effective and continuous self-directed learning.

Pharmacy Specific Ability-Based Outcomes

Pharmacy specific outcomes consist of knowledge, skills and attitudes within the pharmacy context. To achieve professional competency, the graduate must develop the general abilities described above while assuming personal responsibility for achieving each of the following pharmacy related outcomes. Demonstration of competency in these areas will achieve the primary goal of the PharmD degree program - to develop the ability to use the principles and concepts of pharmaceutical care, independently or in collaboration with other health care professionals, to meet the health care needs of society.

The pharmacy specific outcomes, as written below, are very broad in scope. More detail about each ability-based outcome will be provided in specific courses as you progress through the curriculum.

1. Integrate the knowledge, skills and attitudes gained in basic, clinical and socio-behavioral sciences to provide pharmaceutical care to individuals, families and diverse patient populations in various practice settings.

Effective pharmacy practitioners must be able to synthesize and integrate abilities acquired from the various science disciplines to provide comprehensive pharmaceutical care services.

2. Apply the principles of economic and administrative sciences to address the pharmacy related needs of contemporary society.

Effective pharmacy practitioners must be able to function successfully within organizations and the larger community to facilitate improvement of health care.

3. Engage in activities to provide drug information and education and promote public health.

Pharmacy practitioners fill a critical role in society as the most qualified and respected source of drug information and related pharmaceutical education and serve as the most accessible health care provider in the promotion of public health.

4. Demonstrate professional and social responsibility.

The public grants pharmacists the privilege of serving the health

care needs of society within a framework of laws, regulations and ethical standards. Within this context, pharmacy has become one of the most highly respected professions. Members of the profession must strive to uphold this honor and respect from society by behaving in a manner worthy of this esteem in all interactions. Active involvement in professional organizations also serves to improve the stature of the profession. Additionally, professional conduct facilitates the practice and utilization of pharmaceutical care.

APPENDIX B. PROFESSIONAL SKILLS DEVELOPMENT COURSE OUTCOMES FOR FIRST YEAR

Fall Semester

Upon completion of the first semester the student is expected to be able to:

- 1) Identify his/her own strengths and weaknesses as a communicator on the interpersonal level.
- 2) Identify and effectively utilize methods of verbal and non-verbal communication in a variety of situations.
- 3) Effectively utilize the pharmacy laboratory computer system to complete professional tasks.
- 4) Demonstrate accurate observational/comprehension/evaluative skills as evidenced by factual identification and documentation of information.
- 5) Recognize and describe his/her own problem solving process.
- 6) Identify and effectively utilize his/her own personal, cultural, and generational values in professional situations.
- 7) Identify and effectively utilize her/his own behaviors while involved in teamwork/group interaction activities.
- 8) Identify own and others' behavior that supports or detracts from professionalism.
- 9) Demonstrate professionalism as evidenced by appropriate professional behavior.
- 10) Utilize and integrate knowledge from concurrent and prior courses and experiences to solve problems presented in class.

Spring Semester

Upon completion of the Spring semester the student is expected to be able to:

- 1) Identify his/her own and others' strengths and weaknesses as communicators on the interpersonal and interprofessional levels and provide supportive evidence.
- 2) Effectively utilize audience-specific verbal, non-verbal, and written communication methods in a variety of situations.
- 3) Effectively utilize the university's informatics system to achieve module and course outcomes.
- 4) Implement his/her own problem solving process in the context of professional situations.
- 5) Identify and function within his/her own values systems in the context of professional situations.
- 6) Employ effective teamwork behaviors to facilitate a productive working environment for your group and the class as a whole.
- 7) Identify one's own attitudes and actions that support or detract from professional behavior.
- 8) Demonstrate expected professional and classroom behavior as outlined in the Student Ethics and Conduct Code.
- 9) Create a plan to improve professional and classroom behaviors and work to achieve the goals of that plan.
- 10) Apply principles of and demonstrate proficiency in the practice of pharmaceutical care to achieve optimal patient outcomes (*i.e.*, using drug information, pharmacy law, calculations, compounding, medication order processing, and other features of pharmacy practice).

APPENDIX C. MAPPING OF FALL SEMESTER COURSE OUTCOMES TO SCHOOLS GENERAL CURRICULAR OUTCOMES

General curricular outcomes:

1. Communicate using various modes of communication including people, ideas, texts, media, and technology
2. Think critically, solve problems and make decisions.
3. Demonstrate effective interpersonal and professional interactions
4. Integrate information derived from theory, concepts and factual evidence.
5. Make value judgments and independent decisions.
6. Self-assess and engage in self-directed learning.

Fall semester course outcomes:

1. Identify his/her own strengths as a communicator on the interpersonal level. (1)*
2. Identify and effectively utilize methods of verbal and non-verbal communication in a variety of situations. (1), (3)*
3. Effectively utilize the pharmacy lab computer system to complete professional tasks. (1)*
4. Demonstrate accurate observational, comprehension, and evaluative skills as evidenced by factual identification and documentation of information. (4)*
5. Recognize and describe his/her own problem-solving process. (2)*
6. Recognize and describe his/her own personal, cultural and generational values in professional settings. (3), (5)*
7. Identify and effectively utilize his/her own behaviors while involved in teamwork and group interaction activities. (3)*
8. Identify own and others' behavior that supports or distracts from professionalism. (3)*
9. Demonstrate professionalism as evidenced by appropriate professional behaviors. (3)*
10. Utilize and integrate knowledge from current and prior courses and experiences to solve problems presented in class. (4), (6)*

*Each course outcome was derived from at least one general curricular outcome. The numbers in parentheses of the course outcomes refer to corresponding general curricular outcomes.

APPENDIX D. CONCEPTS AND ABILITIES TO BE LONGITUDINALLY INTEGRATED IN THE PROFESSIONAL SKILLS DEVELOPMENT COURSE SEQUENCE

Calculations

- pharmaceutical (relating to drug delivery systems)
- pharmacokinetics; dosing

Communication

- oral & written
- with practitioners, colleagues, patients and caregivers (didactics on presentation skills could be included in Seminar track)
- includes: interviewing, consultation, education, "phone," dealing with challenging people; preparing protocols, monographs, abstracts and other forms of technical writing/communication

Drug delivery systems

- compounding: oral, topical, rectal, IV
- sustained-release, enteric coated, topical, transdermal, ophthalmic, otic, biologic, injectable/parenteral, sublingual, inhaled, rectal/vaginal, troches, other oral

Drug information and analysis

- drug information (using informatics and traditional sources)
- medical terminology
- literature evaluation

Informatics

- using computers to complete assignments/tasks
- processing prescription orders using computer

- documentation of activities/services
- billing/reimbursement
- electronic medical record

Legal/ethical issues

- pertaining to pharmacy practice/pharmaceutical care
- drug diversion, drug seeking

Physical assessment

- relating to specific IOS, e.g., BP, lipids, glucose, pulmonary, dermatology, CNS
- monitoring for efficacy or toxicity

Problem solving/decision-making/evidence-based medicine

- SOAP noting
- data interpretation, e.g., lab values, diagnostic tests, c&s, acid/base - fluid status, other info from medical record and other sources (patient, provider, caregiver)
- some management issues
- supporting opinions with evidence/rationale
- prospective drug utilization review
- what information is needed before patient is given drug
- gathering/evaluating evidence
- developing differential

Professionalism

- what it is, why it is important, how it is measured, continually emphasized and measured for students

Socioeconomic/cultural/demographic issues

- related to individual patient care, as well as populations
- related operation of pharmacy/clinic

- P&T/formulary considerations in patient care

Teamwork

- with peers and other healthcare professionals; group problem-solving; practice and evaluation (didactic done in Intro to Pharmacy or Seminar)

APPENDIX E. EXAMPLE OF PROFESSIONAL SKILLS DEVELOPMENT COURSE WEEKLY MODULE AGENDA

PHRD 3150 PROFESSIONAL SKILLS DEVELOPMENT
Hammer/Paulsen

SPRING MODULE 5 AGENDA

Class Times and Room Assignment

Tuesday February 15, 2000	1:00-4:00	Room 324
Wednesday February 16, 2000	1:00-4:00	Room 324
Friday February 18, 2000	1:00-4:00	Room 324

Pre-lab Due:

- 1) The prescription worksheet assigned in Module 3. This is due at the beginning of class. This worksheet is worth a total of 20 points. You will receive 10 points for completing and turning in the worksheet and 10 points for providing accurate, honest, thoughtful and useful answers to the two questions on the last page. If your worksheet was not reviewed and signed by a pharmacist you will receive zero points.

Materials to bring to class:

- 1) Module 5 agenda
- 2) Calculations book
- 3) Calculator

Required reading and prerequisite knowledge:

- 1) Read pages 77-85 in your calculations book (aliquoting and geometric dilution)
- 2) Read and be prepared to discuss the article "Image is Everything: Protecting Pharmacy Status as a Profession." This document is located in "Blackboard" under Course Documents in the Module 5 folder. You DO NOT have to download it and bring it to class.

Module Outcomes:

- 1) Using effective teamwork behaviors and appropriate communication accurately complete the group prescription worksheet.
- 2) Demonstrate proficiency in the areas of medication information to complete the prescription worksheet for the primary purpose of optimizing patient outcomes.
- 3) Identify and discuss characteristics of professionalism based on student and expert perception.
- 4) Accurately perform aliquot calculations.
- 5) Accurately perform a geometric dilution by zeroing the prescription balance, accurately weighing powders and blending in geometric fashion.

These support course outcomes 2, 6, and 10.

Today's Activities:

1:00 - 1:05

Introduction to today's activities

1:05 - 1:25

Discussion of article and views of professionalism.

1:25 - 2:00

Group prescription worksheet

2:00 - 2:30

Calculations: Aliquoting (Kristal Morris, PharmD, Pharmacy Practice Resident)

2:30 - 2:40

A well deserved break.

2:40 - 3:10

Group aliquoting calculations and class presentations.

3:10 - 3:50

Based on calculations in the previous section; use the prescription balance to weigh the ingredients and perform geometric dilution.

3:50-4:00

Wrap-up and preview of next week

Assessments and Point Distribution: (45 points total)

- 5a) The prescription worksheet assigned in Module 3. This is due at the beginning of class. This worksheet is worth a total of 20 points. You will receive 10 points for completing and turning in the worksheet and 10 points for providing accurate, honest, thoughtful and useful answers to the two questions on the last page. If your worksheet was not reviewed and signed by a pharmacist you will receive zero points.
- 5b) 10 points Final group prescription worksheet. This will be graded for accuracy and a group grade will be assigned. Make sure your name is written on this worksheet to document your contribution (and receive a grade)
- 5c) 10 points Aliquot calculations: graded for accuracy.
- 5d) 15 points Appropriate and accurate use of prescription balance to accurately weigh powders and a precise demonstration of geometric dilution. Students will receive 5 points for "zeroing" the balance, 5 points for accurately weighing the powders and 5 points for demonstrating proper procedure for geometric dilution.

Exit Assignment:

- 6a) 15 points Using the group prescription worksheet completed in Module 5, complete the patient counseling worksheet. The patient counseling worksheet is based on the three prime questions and is intended to help you succeed with your midterm patient counseling video session with the standardized patients. Instructions are included on the patient counseling worksheet.

Remember: There will be NO Professional Skills Development Class the week of Feb. 21-25. You will be attending the Glaxo Career Pathways program that week. Professional Skills Development will resume with its normal schedule the following week.

Time Management:

Assigned readings should take about 1 hour. Read the calculation portion carefully. Aliquoting is not a naturally intuitive process for everyone. If you find you have questions after the reading; do not be surprised! If you have many questions after the reading you might start by talking with a classmate for clarification.....prior to class. This will make your class time more useful and productive. There will be a guest lecturer who will present a short didactic section discussing the process of aliquoting.