TEACHERS' TOPICS

A Capstone Course with a Comprehensive and Integrated Review of the Pharmacy Curriculum and Student Assessment as a Preparation for Advanced Pharmacy Practice Experiences

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Objective. To create a capstone course that provides a comprehensive and integrated review of the pharmacy curriculum with a broad range of assessment tools to evaluate student knowledge and skills as a final preparation prior to beginning fourth-year advanced pharmacy practice experiences (APPEs).

Design. The capstone course was a 4 credit-hour, case-based course. Eight comprehensive cases were assigned to students over the course of the term. The cases were designed to mimic complex clinical scenarios that students were likely to encounter during an APPE. Students were required to prepare a written and oral presentation for each case and were assessed on material covered during the cases. Faculty members presented weekly reviews on selected topics such as calculations, pharmacokinetics, and pharmaceutical compounding. At the end of the course, students took an observed structured clinical examination (OSCE), which simulated the Georgia Board of Pharmacy Practical Examination, and a comprehensive examination designed to mimic the NAPLEX (North American Pharmacy Licensure Examination).

Assessment. Evaluation of student outcomes was based on written and verbal presentations of the cases, multiple-choice examinations, a short-answer calculations examination, an “Errors and Omissions” examination, a standardized patient encounter, and pharmaceutical compounding examinations. Ninety-five percent of students successfully passed the course on their first attempt. Student feedback indicated satisfaction with the depth, breadth, and organization of material covered and felt that the course helped prepare them for APPEs.

Conclusion. The culminating experience of the capstone course gave students a thorough review of practical, clinical, and communication skills and provided faculty members with feedback regarding the curriculum through robust assessment.

Keywords: Capstone, case-based learning, integrated curriculum, communication, advanced pharmacy practice experience

INTRODUCTION

The Accreditation Council for Pharmaceutical Education (ACPE) Standards focus on ensuring student development in patient care as well as instilling competence and confidence for collaborative practice with other health care providers.^{1,2} Standards 10, 11, and 13 specifically call for not only integration of curricular content, critical-thinking, and problem-solving skills but also reinforcement and advancement throughout the curriculum. Appendix D in the Standards lists various performance domains and abilities students are expected to achieve before they start APPEs. Schools and colleges of

pharmacy use various methods to instill and assess these core abilities in students such as introductory pharmacy practice experiences (IPPEs), simulations, practice laboratories, end-of-term examinations, OSCEs, and comprehensive examinations.

Capstone courses are not new to academia. Disciplines such as nursing, basic sciences, veterinary medicine, and sociology and gerontology have reported incorporation of capstone courses in their curricula.³⁻⁷ Capstone courses are unique in that they can be utilized for both teaching and assessing student knowledge and skills. Several schools of pharmacy have implemented capstone courses in their curriculum.⁸⁻¹⁰ There are few published papers describing capstone courses in pharmacy, and there is a variety of course design among the courses described, ranging from a 5-week APPE research

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rotation, to a diabetes camp, and a 2-credit hour pharmacotherapy course to improve clinical documentation skills.⁸⁻¹⁰

Capstone courses help institutions achieve and assess the ACPE Standards and help students transition from didactic to experiential portions of the curriculum, and from academic to independent professional practice.⁸⁻¹¹ The capstone course is designed as a culminating experience that focuses on integration and synthesis of knowledge already gained throughout the didactic curriculum and that gives students an opportunity to apply their clinical and practice skills. Additionally, assessment of student outcomes and student self-assessment are important aspects of capstone courses.¹²

The Philadelphia College of Osteopathic Medicine (PCOM) School of Pharmacy (SOP) in Suwanee, Georgia has an integrated 4-year curriculum that follows a 3-term (13 weeks each) academic calendar. The curriculum includes a capstone course offered during the spring trimester of the third academic year, the last term of didactic curriculum. The purpose of the capstone course is to provide students with a comprehensive and integrated review of the pharmacy curriculum as a final step to ensure they are prepared to begin the APPE. A secondary goal of the capstone course is to prepare students for examinations by simulating the North America Pharmacy Licensure Examination (NAPLEX) and the Georgia State Board of Pharmacy Practical Examination which, consists of a wet laboratory, errors and omissions (E&O), and a verbal clinical case.

We felt that a case-based, learner-focused approach was the most appropriate course design to help students transition from the predominantly didactic to the experiential portion of their education and to foster independent learning. The cases were designed to imitate typical clinical situations that students should be prepared to encounter in the APPE. Learning objectives included patient-centered care, drug therapy, disease states, drug information, literature evaluation, and calculation and compounding. The capstone course offered at PCOM is unique in that it is designed to encompass a broad spectrum of topics to ensure competency in pharmacotherapy, calculations, pharmacokinetics, compounding, and verbal and written communication skills in students prior to the APPE.

DESIGN

This study received exemption from the Institutional Review Board.

A 3-pronged strategy integrated in the capstone course design sought to review significant topics from the curriculum, instill confidence in students by evaluating individual student skills, and assess student readiness

for APPEs. It was a 4-credit hour course offered in the same term as a 1-credit hour case studies course. A case study course in the PCOM SOP curriculum was offered in each term of the second and third didactic years. Students were divided into groups and presented with a clinical case. Each group worked independently, in breakout rooms, for about 2 hours to assess the case and then wrote and submitted a subjective, objective, assessment, and plan (SOAP) note. At the end of the group work, all students reconvened in the classroom and groups were called on to verbally present parts of the case to the entire class in the presence of a faculty member. The faculty member then addressed the entire class to review the take-home points of the case and to provide feedback. During the spring term of the third year, the case studies course was modified so students only submitted the SOAP note. The cases presented in the case studies course were then used in the capstone course for in-depth discussion and further evaluation.

The capstone course design can be summarized as weekly pattern that repeated 8 times (Table 1). On Mondays, students were presented with a “mega-case” in the case studies course. Students were allotted 3 hours to work on the case with their respective groups. The faculty member in charge of the weekly case was available during this time to answer questions. On Wednesdays and Thursdays, the cases were reviewed, and student groups presented their SOAP notes and clinical findings to the class. In addition to mega-cases, several topics for review were selected by the curriculum committee and course coordinator. Every Tuesday was “Topic Tuesday,” during which a faculty member presented a review of key concepts related to the topic of the week. To supplement these instructional components, certain Fridays were designated as optional “Open-Lab Fridays,” during which students could practice compounding and sterile product skills and accompanying calculations at the pharmaceutical compounding and pharmacy practice laboratories. Student assessment in the course consisted of 4 multiple-choice examinations, one comprehensive examination, a comprehensive 2-day OSCE, and 8 mega-case presentation evaluations.

Due to the complexity of the course, variety of topics discussed, and skills practiced, this course was team-taught. Various faculty members from the pharmaceutical sciences and pharmacy practice departments collaborated, which reduced strain on one particular department and allowed faculty members to assist in the area of their expertise. This also gave students the opportunity to experience different approaches to patient care and different teaching styles, which would help them when transitioning to APPEs.

Table 1. Design of the Capstone Course/Case Studies

	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10
Monday Case Studies (3 hrs)	Capstone orientation (1 hr) Mega-Case #1	Mega-Case #2	Mega-Case #3	Mega-Case #4	Mega-Case #5	Mega-Case #6	Mega-Case #7	Mega-Case #8		
Topic Tuesday (2 hrs)	Compounding	Compounding	Calculation review	Fluids & electrolytes	None	Pharmacokinetics review	Facilitated team presentations	Errors and omissions Review	MEGA OSCE preparation	APPE readiness
CAPSTONE Wednesday (2 hrs)	Facilitated team presentations	Facilitated team presentations	Facilitated team presentations	Facilitated team presentations	Facilitated team presentations	Facilitated team presentations	Facilitated team presentations	Facilitated team presentations	MEGA OSCE Part I	
Thursday (2 hrs)		Exam #1		Exam #2		Exam #3	Comprehensive exam		MEGA OSCE Part II	Exam #4
Friday Optional Lab (3 hrs)	Compounding capsules, suspensions	Compounding ointments, creams	Sterile IV prep + calculations	None	Calculations, PKS, Sterile IV prep	SP practice (4 hrs)	Verbal case practice	None	None	None

The capstone course was predominantly case-based, with 8 mega-cases presented by different faculty members throughout the trimester. The term “mega-case” was coined to indicate the cases were comprehensive and included many disease states and drug therapy problems to simulate real-life complex clinical situations that the students would likely encounter in APPEs. Usually, the clinical cases revolved around 1 or 2 major (or primary) disease states and various comorbidities. The cases were designed to incorporate evidence-based medicine by referring to current practice guidelines and relevant clinical trials. Usually there were 1 or 2 major disease states discussed (primary disorder(s)) and the comorbidities. The major disease states covered throughout the course included endocrine, cardiovascular, infectious diseases, gastrointestinal, pulmonary, neurological and psychiatric, and renal and musculoskeletal disorders. Other considerations included in the cases were obesity, use of dietary supplements and nonprescription medications, and pharmacoeconomic and socioeconomic aspects. Faculty members selected disease states that students would most likely encounter on APPE rotations. Major disease states were generally covered more than once during the course in order to reinforce key concepts and therapeutic management. For example, 1 case focused on newly diagnosed type 2 diabetes in a patient self-medicating with numerous dietary supplements who presented to the emergency department with diabetic ketoacidosis. However, the patient had several comorbidities including hypertension, hyperlipidemia, renal failure, osteopenia, and obesity. In working up the case and developing their SOAP note, students were required to address all of the disease states and to conduct a thorough review of each dietary supplement the patient was taking.

Faculty members were encouraged to design their cases per their discretion; however, they were asked to incorporate certain disease states or conditions if the course coordinators felt that specific disease states or conditions were not adequately covered in other cases. Mega-cases often had more than one section, with subsequent sections including either a complication from the initial diagnosis or a readmission. In addition to the disease states covered, faculty members were encouraged to include socioeconomic issues, pharmaco-economic issues such as formulary concerns, and compliance issues into their cases in order to simulate scenarios typically seen in clinical practice. One specific requirement for the cases was that primary literature as well as commonly used guidelines be incorporated into the cases to ensure the student’s ability to practice evidence-based medicine.

The mega-case review, evaluation, and presentation section of the course was team-based; students were

divided into 10 groups of 7-8. Mega-cases were posted on Blackboard (Blackboard, Inc. Washington, DC) the Wednesday before the student group meeting to give students time to prepare for discussion with their assigned groups. As part of the case studies course, student groups met for a 3-hour period on Mondays, collaborated on the written assignment and submitted 1 assignment (typically in SOAP note format). Students were usually given 6 days from the time the mega-case was posted on Blackboard to complete the case. The faculty member(s) who assigned the case also graded the cases.

A discussion section led by the faculty member assigned to that particular case was part of the capstone course. During this 2-3-hour session, student groups presented their case to the entire class. Prior to the course, student groups were randomized to verbally present 3 cases throughout the course. These group assignments were not publicized to the students so each student group would adequately prepare for every case. The faculty member selected 2-5 student groups to present each case and then assessed student knowledge and understanding of the topic by asking specific questions regarding the disease states and medications covered in the case. During the final lecture hour dedicated to the mega-case, the faculty member(s) provided a wrap-up of the case, underscoring important take-home points for the students.

Grading rubrics for the written and verbal presentations were provided to students and faculty members and were included in the course syllabus. In addition, students were required to submit a peer evaluation form to help ensure that all members of the groups participated adequately in the preparation of the cases.

In addition to mega-cases, select faculty members presented a 2-hour didactic lecture on a variety of topics on "Topic Tuesdays." Topics included pharmaceutical calculations, pharmacokinetics, pharmaceutical compounding (4 hours), and fluids and electrolytes. These topics were selected based on the assessment of the curriculum and student evaluations in various courses and were seen as beneficial in preparing students for the APPEs and for the final OSCE and comprehensive examination at the end of the capstone course. Topic Tuesdays were also used to review skills included in the final OSCE.

To enable students to practice their compounding skills, we instituted a voluntary "Open-Lab Friday" several times throughout the term. Each of these Fridays was dedicated to a specific compounding skill, such as sterile products, topical preparations, and oral preparations (solutions, suspensions, and capsules). Students were given several compounding problems at each laboratory and an answer key was provided. Faculty members were present in order to facilitate and to answer questions. Although

attendance at the open laboratories was optional, approximately 80% of the students took advantage of the experience. One laboratory was dedicated to a practice standardized patient encounter (SPE) and attendance was mandatory because the encounter was part of the mega-OSCE and was required to successfully pass the capstone course. Five standardized patients (SPs) were brought in to simulate patients who were receiving a new prescription. Patients were debriefed on their prescription and were also given information regarding drug interactions with their other medications and disease states. Each student was allotted 10 minutes with the SP to conduct a patient interview. The SP encounter was videotaped for review by the student and faculty member. Standardized patients gave immediate feedback to students after the patient counseling session.

The capstone course required participation from many faculty members, but the course was designed so faculty members facilitating mega-cases only devoted 1 week to the course (Monday, Wednesday and Thursday for each mega-case) and an additional 2 days for the mega-OSCE. Faculty members who gave Topic Tuesday discussions generally did not facilitate mega-cases and were only required to give their 2-hour lecture and to help facilitate the open laboratory if applicable to their topic. For example, the faculty member who gave the pharmaceutical compounding review also helped out with the compounding open lab that same week. The first day of the mega-OSCE required 12 faculty members from pharmacy practice and 4 administrative assistants to help with proctoring. The second day required 7 pharmacy practice faculty members for the sterile product portion and 4 pharmaceutical sciences faculty members for the pharmaceutical compounding portion. Administrative assistants and other faculty members were also required to help with proctoring of the short answer calculations examination.

Assessments for the capstone course included written and verbal case presentations of the 8 mega-cases, 4 examinations based on topics discussed during the cases and the didactic portion of the course (Topic Tuesdays), a comprehensive examination, and a cumulative OSCE (the mega-OSCE), described in detail below. With the exception of the examinations (including the comprehensive examination), all assessments were graded pass/no-pass with rubrics included in the course syllabus. Examinations, including the comprehensive and the Errors and Omissions examinations, were in multiple-choice format. The calculations and pharmacokinetics examination in the final OSCE was in short-answer format, and faculty members could give partial credit for incomplete answers. The standardized patient experience, verbal clinical case,

Table 2. Assessment Tools for the Capstone Course

Assessment	Grading	Pass Rate % (N=73)
Cases:		
Mega-cases (8)	pass/no-pass	100
Examinations		
Examinations (4)	12.5 % each	100(cumulative)
Comprehensive examination	50%	98.6
Mega-OSCE:		
Standardized patient encounter	pass/no-pass	100
Clinical case (verbal presentation)	pass/no-pass	97
Errors and omissions	pass/no-pass	100
Short answer calculation/PKS exam	pass/no-pass	98.6
Sterile compounding	pass/no-pass	100
Pharmaceutical compounding	pass/no-pass	100

and compounding exercises of the final OSCE were graded on a pass/no-pass basis. Each scored assessment in the capstone course required a minimum score of 70% to pass.

Capstone course assessments were developed so student readiness for APPEs could be determined. Also, each part of the course or assessment was given equal importance, hence students were required to pass every component of the course in order to pass the capstone course. The mega-OSCE and comprehensive examination were designed to assess APPE readiness. If students failed any part of the course or any part of the mega-OSCE, including the comprehensive examination, they received a no-pass grade for the entire capstone course and had to remediate the course in the following summer I term, or first APPE rotation block following the capstone course. The breakdown of assessments for the capstone course is provided in Table 2.

The written assignments, including SOAP notes, were submitted by student groups and were graded by faculty members based on a rubric that focused on the inclusion of relevant and valid information and appropriate, patient-specific assessment and plan based on the disease states and medication problems identified. Verbal presentations were graded by faculty members based on a rubric that focused on delivery style as well as clinical content. Each student within the group was required to verbally present part of the Mega-Case when his or her group was called upon to present. These rubrics assigned numerical points for various components; however, the written and verbal assessments were graded as pass/no-pass. A minimum score of 70% was required to pass the assignment. If written presentations were inadequate, student groups were given 1 opportunity to revise and resubmit the presentation for credit. Although students submitted their written assignments as a group, each student in the group was assessed individually based on peer

evaluation, presentation skills, and attendance. Because each student group submitted only 1 SOAP note, individual assessment of written assignments by faculty members was not possible. However, since each student in the group was required to present part of the case, faculty members were able to assess each student individually on verbal presentation. Any specific student within a group who failed any pass/no-pass assignment was afforded 1 make-up assignment at faculty members' discretion.

The culmination of the capstone course was the mega-OSCE conducted over 2 days. The mega-OSCE included the following assessments: a standardized patient encounter, presentation of a clinical case to 2 faculty members, and an Errors and Omissions examination in Georgia State Board of Pharmacy Practical Examination format; the following day, a 90-minute, 20 question short answer calculations and pharmacokinetics exam, and a wet laboratory that included both sterile and pharmaceutical compounding and calculations.

The SPE was described earlier in this article. Students were given 5 minutes to review a new prescription including patient history and current medications. Each student then provided counseling to the standardized patient utilizing the Indian Health counseling method. Students were given 10 minutes to counsel their patient. The standardized patients graded the students based on a provided rubric, and the SPE was videotaped for review by faculty members to ensure accuracy of grading by the SPs.

Students were then given 15 minutes to review and prepare a clinical case. The clinical case was designed to focus on more than one of the following common disease states that students were likely to encounter frequently during their APPEs: hyperlipidemia, hypertension, diabetes mellitus, and asthma/COPD (chronic obstructive pulmonary disease). Students were given a worksheet to help prepare their case. After the 15 minute preparation, each

student was given an additional 15 minutes to present the clinical case to 2 faculty members, who had been debriefed on the case prior to the OSCE and were also given a key with major points regarding the case. The verbal presentation was graded based on delivery, organization and content including a rationale for recommended interventions. Two faculty members assessed each student in order to minimize inter-rater variability and bias.

The Errors and Omissions (E&O) portion of the OSCE was designed to mimic the Georgia State Board of Pharmacy Errors and Omissions exam. Students were given 15 prescriptions and prescription labels in PowerPoint format. They were given 2 minutes to review each prescription to assess it for accuracy and completion. There was 1 error or omission per prescription. Answer choices for the E&O were as follows: (A) contact physician because of an error or omission in the written prescription; (B) prescription filled with the wrong drug or the wrong strength of the correct drug; (C) error or omission by pharmacist on the computer generated label; (D) controlled substance prescription does not meet federal or state requirements; (E) improper substitution based on Georgia law; (F) no error or omission exists. Students filled in Scantron forms (Scantron Corporation, Eagan, MN) for this exam. Because the Scantron forms only had 5 options (A through E), for the "F" choice (no error or omission), students filled in both A and B.

On day 2 of the OSCE, students first completed the short-answer calculations and pharmacokinetics exam. They then received 2 prescriptions for compounding: a prescription for a sterile product and a prescription for a pharmaceutical compounded product (ointment, cream, capsule or suspension). Students were given 30 minutes to review the prescriptions and perform the required calculations. They were then brought into the compounding labs in groups of 15 students to compound their products. Eight faculty members monitored and evaluated the sterile compounding and 4 faculty members monitored and evaluated the pharmaceutical compounding. Evaluation was based on both calculation and technique based on provided grading rubrics.

Students who did not pass all portions of the capstone course, including the mega-OSCE and comprehensive exam, were not able to start their APPE during the Summer I rotation, and instead were afforded the opportunity to remediate during that 5-week period. The fourth professional year of the PharmD curriculum consists of nine 5-week APPE sessions. Students are required to complete 8 APPEs with 1 off-session. Since students are scheduled to begin their APPEs in the summer I term, the first APPE block, remediation students would not be able to start their APPE during that block and would have to complete

all 8 APPEs in the remaining 8 sessions. In case of unsuccessful remediation of the capstone course, students met with the Academic Performance and Standards Committee for action on academic future including dismissal from the program. Hence, these were high-stakes assessments. Since the capstone course was so complex with so many components, remediation was done as follows: students who did not pass 1 or more mega-cases were given 1 opportunity to remediate the case during the spring term. If students did not pass upon remediation, they were required to remediate the mega-case(s) during the summer I APPE term. The course coordinator divided the mega-OSCE in the following 3 sections: Errors and Omissions and short answer calculations examination, pharmaceutical and sterile compounding and verbal clinical case, and standardized patient encounter. Students who did not pass 1 section were required to remediate both sections of the different "sections" in order to successfully remediate the course. For example, a student who did not pass the verbal clinical case had to retake that case and the standardized patient encounter. Students who did not pass the comprehensive examination were given the opportunity to retake it during the summer I APPE term.

EVALUATION AND ASSESSMENT

The capstone course was offered for the first time during the spring trimester of the 2012-13 academic year and was evaluated with the online CourseEval (ConnectEDU, Inc., Boston, MA) system. The course enrollment consisted of 73 students. Overall, 95% of students successfully passed the capstone course. No student achieved a no-pass in more than 1 portion of the course. Those students who did not pass successfully remediated during the Summer I block and started their APPEs during the Summer II block. Fifty-nine students completed a course evaluation for a response rate of 81%. The students rated the course highly (average mean 4.8/5, with a score of 1.0 being poor and 5.0 excellent). Students generally agreed with the response statement, "Course content was appropriate for my level of knowledge" (mean score $\pm$ SD: 4.8 ± 0.41). In terms of the overall progression of difficulty level of the course, the mean rating was also 4.8 ± 0.43 . The students also agreed that course content was consistent with the course objectives as presented in the syllabus, (4.8 ± 0.46). Students' responses in comment boxes were generally positive, with students reporting that they developed several skills as a direct result of the presentation and SOAP discussion. The open laboratories were also seen as helpful. Students commented that the ability to use the laboratories freely helped them prepare for the mega-OSCE. In the comments section of the course evaluations, students stated that they felt more

prepared for and confident about the APPEs and licensing examinations.

A number of written comments reflected these ratings. For example, 1 student commented that “This course, along with the case studies, really helped solidify key ideas and bring things together.” Another student reflected “. . . excellent job on Capstone. Course very well designed from Case studies to Topic Tuesdays and Mega OSCE. . .” Regarding preparation for the APPEs, one student commented “Great class to sum up all the therapeutic info throughout school. Very glad we had this class and I’m sure it will help out on rotations. Glad we had the comprehensive tests and OSCEs also.”

There were also comments with constructive criticism regarding the course. Because this was the first time the course was offered and because the course design was complex, scheduling glitches and some last-minute changes occurred. One student commented, “Besides the scheduling issues and the on again/off again testing strategies, this was a great course. . . Hopefully next year it will be better structured with appropriate scheduling. . .” For the 2014 spring term, scheduling was finalized prior to the start of the term, and the course and mega-OSCE flowed more smoothly.

DISCUSSION

Based on both formal and informal student feedback as well as preceptor feedback from APPEs, we incorporated some changes in the 2014 capstone course. Students reported enjoying the formulary management exercise in mega-case #8 and said they wished more cases incorporated pharmacoeconomic issues. Therefore, we added formulary management issues into several mega-cases the following year. Some faculty preceptors noted that students would benefit from additional practice with journal club, so we replaced 1 of the mega-cases with a journal club exercise in which each student group was assigned an article (primary literature or a meta-analysis) and presented the article in journal club format, summarizing and evaluating the article. In order to better assess student attitudes regarding the capstone course, we added a requirement of a reflective paper at the end of the course. In the future, we plan to administer an additional course-specific, open-ended evaluation form that will focus on evaluating course content, organization, learning activities, effectiveness of various teaching styles, and team-teaching. This evaluation form is currently being designed and approved by appropriate committees.

The PCOM School of Pharmacy’s mission is to educate and train students so they are “work-ready” (ie, competent) for APPEs and ultimately in employment. The capstone course was designed to give students

a comprehensive review of a broad range of topics relevant to pharmacy practice and to assess their readiness to transition from the didactic to the experiential portion of the curriculum. The mega-case format allowed faculty members to assess student knowledge and understanding of disease states, clinical assessment, and pharmacotherapy, and gave students the opportunity to practice their written and verbal presentation skills. The robust assessment techniques allowed faculty members to detect specific areas of student weakness and enabled us to target remediation of those particular skills.

Student feedback in a team-taught course such as a capstone is of particular interest so the effectiveness of using multiple instructors can be gauged. The advantage of having multiple instructors is that faculty members from different backgrounds can present and teach in their primary focus of work and research, and students are exposed to various teaching styles to simulate the experience of having multiple preceptors during the APPE year and clinical practice. However, the need for multiple instructors and administrative assistants to teach and proctor the capstone course, and in particular during the mega-OSCE was very challenging for both the course coordinator and faculty members. Because capstone is so time and work intensive, a co-coordinator was added to help with scheduling and oversight of the many aspects of the course.

Anecdotal evidence suggests that both faculty member and non-faculty member preceptors were appreciative of our efforts in preparing students for APPEs, and most students received favorable evaluations from their preceptors. In addition, student feedback about the capstone course they gave after starting APPEs was positive, suggesting students understood the significance of the challenging nature of the course.

SUMMARY

The capstone course design successfully integrated a variety of faculty members, topics, and assessment techniques to prepare students for APPEs and licensure examinations. The broad scope of the course, including a comprehensive review and assessment of clinical skills, calculations, and compounding techniques gave students an opportunity to hone their skills prior to transitioning from the primarily didactic to experiential portion of the curriculum.

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