Research

# A comprehensive capstone course focusing on simulation in community, ambulatory, and acute care

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## Abstract

*Introduction:* To provide patient centered simulation within a capstone course prior to advanced pharmacy practice experiences (APPEs).
*Materials and methods:* A three credit, one semester capstone course incorporating community, ambulatory, and acute care experiences. Students applied clinical knowledge to simulated patient experiences in a self-directed learning environment, utilizing mock patients and iStan, the advanced high-fidelity patient simulator.
*Results:* Students were assessed based on their successful completion of Objective Structured Clinical Examinations (OSCEs).
*Conclusion:* The course was met with overall satisfaction from students and successfully provided students with a simulated experience in the areas of community, ambulatory, and acute care prior to APPEs.
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## Introduction

The Center for the Advancement of Pharmacy Education (CAPE) Outcomes emphasize patient centered care and communication with patients and health care providers.[1] Whereas the pharmacy curriculum addresses the foundational knowledge domain described in the outcomes, application of concepts during advanced pharmacy practice experiential (APPE) rotations continues to be a challenge.[2] To address this need for further experience in application a pharmacy capstone course was designed and implemented in the final semester before rotations began. The capstone model is intended to develop skills that employers and colleagues view as essential in practice.[3]

Western New England University (WNEU) College of Pharmacy accepted their first class of 75 pharmacy students in Fall 2011. The curriculum spans four years and each of the 13 therapeutics modules is team taught between the Department of Pharmaceutical and Administrative Sciences and the Department of Pharmacy Practice. Students begin therapeutics courses during spring of their second professional year and the classes conclude in spring of their third professional year. Case discussion has been shown to increase retention and is one method used within the therapeutics courses to reinforce key points.[4] This learning method allows the students to apply their knowledge but does little to incorporate the outcome of communication and pharmacist as educator delineated by the CAPE Domains 3.6 and 3.2.[1] Though the students have three introductory pharmacy practice experiences (IPPEs) with at least one in hospital and one in community pharmacy, often the first experience health care students have directly applying their knowledge to a patient is on experiential rotations.[2] Other colleges of pharmacy have developed courses to address this need for transition to APPE rotations and the application of knowledge.

Previous capstone courses have utilized group work activities and presentations to improve application of

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knowledge or introduce disease states not addressed previously in the curriculum.[5–7] The experience of patient contact and simulated pharmacy scenarios was missing from these capstone courses. Trujillo et al.[8] described a student-directed capstone course that utilized authentic patient cases in order to expose students to the experiences of clinical practice. The simulated experience of patient interaction was not included in the Trujillo capstone course either. Beatty et al. recently described the capstone course at the University of Ohio, a high stakes 19-day capstone incorporating simulation and utilizing the core CAPE domains to ensure that the students are prepared for APPEs. This course proved resource and personnel intensive and may not be feasible in many institutions. They illustrate the benefits a capstone course can provide in showing areas for improvement within the pharmacy curriculum.[9]

The incorporation of simulated community, ambulatory care, and institutional practice scenarios within the capstone course offered at WNEU College of Pharmacy has not been described in previous pharmacy capstone courses. This course incorporates simulation similar to a medical school model that provides patient centered simulation prior to experiential rotations in the form of Objective Structured Clinical Examination (OSCE).[10,11] The course utilizes live simulation with mock patients and incorporated many of the concepts learned throughout the pharmacy curriculum. Focus was given to community, ambulatory, and acute care areas of pharmacy practice, which are required areas of advanced practice experience as designated by the CAPE Outcomes.[1] The course was designed with the ultimate goal of improving student's application skills and providing transition from the classroom to the APPE rotations. The endpoint was the successful completion of the simulated clinical scenarios.

## Methods and materials

The CAPE outcomes served as a guide while developing the course objectives (Table 1). Because guidelines and research may be updated over the course of the student's professional years, the objective was to design a course that would provide the students with the most up-to-date material in commonly encountered disease states and introduce relevant components not previously learned in the didactic setting (e.g., responding to a code as part of an interdisciplinary team).

The goal of the course was to integrate the knowledge and experiences the pharmacy students have learned and been exposed to over the duration of their studies at the College of Pharmacy and then enhance their learning through application via simulated patient–pharmacist encounters. Domain 2.1 of the CAPE outcomes, which focuses on patient centered care and collection of subjective and objective information through detailed patient interviews, physical assessment was incorporated into the course design throughout each module, and physical assessment was included as appropriate.[1] The course was divided into three modules—community, ambulatory, and acute care practice settings.

Each module was four to five weeks in length and facilitated by two faculty instructors. The course was designed to apply the depth and breadth of skills and knowledge learned to simulated patient cases in specific areas of pharmaceutical care. Though the course was broken up into modules, topics, and skills gained within earlier courses, such as communications, physical assessment, professionalism, kinetics, and informatics, were used throughout each module.

The course met for three hours per week over the final semester before student APPE rotations commenced. The first class of the week was a two-hour block with the first hour being lecture and the second hour a debriefing. There was a one-hour lab simulation on the second allotted day. The one-hour lecture focused on describing the activities for the week as well as reviewing the disease states that the student would encounter and any relevant updates in clinical practice guidelines. Following the lecture was a one-hour postlab debrief in which students assessed their performance in lab and the case was discussed. During the one-hour lab simulation portion, the students were divided into small groups and assumed the role of the pharmacist in case scenarios. The simulations were video recorded and made

Table 1
Course learning objectives

1. Evaluate medical and pharmacy-related problems of simulated patients utilizing communication skills and clinical knowledge to triage and find effective resolutions, with focus on patient health and safety.
2. Synthesize an accurate patient assessment and plan utilizing subjective and objective information obtained through effective communication with the patient, his family and his health care team, and through physical assessment of the patient.
3. Design optimal patient-specific therapy based on incorporating principles of pharmacology and evidence-based disease state management.
4. Identify and interpret patient-specific pharmacokinetic and pharmacodynamic considerations in order to recommend appropriate medications and doses for simulated patients and patient cases.
5. Appraise patient's risk factors and influence change through effective communication with patient regarding lifestyle management, smoking cessation and general health and wellness.
6. Analyze the educational needs of a patient and deliver disease state and medication information directed at the appropriate level.