MEETING ABSTRACTS

112th Annual Meeting of the American Association of Colleges of Pharmacy, San Antonio, TX, July 9-13, 2011

BIOLOGICAL SCIENCES

Completed Research

DHA Sensitizes Etoposide to Induce Apoptosis in Brain Tumor Cells. Kruttika N. Bhat, North Dakota State University, Erxi Wu, North Dakota State University. Objectives: Docosahexanoic acid (DHA), dietary omega-3-fatty acid, is necessary in the maintenance of normal brain functioning. When combined with certain anticancer drugs such as doxorubicin and 5-fluorouracil when tested in vitro, DHA shows additive effect against human cancer cells. However, no data are available on effects of DHA combined with chemotherapeutic drugs in brain tumors. In this study, we investigated whether DHA modulated the sensitivity of brain tumor cells exposed to anticancer drug, etoposide (VP16), and mechanisms by which combined DHA and VP16 act synergistically against brain tumor cells. Method: DHA or VP16 was added alone or in combination to medulloblastoma (MB), Daoy and D283, and glioblastoma (GBM), U138 and U87 cell lines. MTS and Hoechst 33342/PI staining were used to determine cell proliferation and cytotoxicity in treated cells. No effects were observed on GBM cells when treated with VP16 or DHA, while the MB cells showed increased sensitivity towards them. DHA and VP16 alone used as controls, showed diminutive effects on cell proliferation and cell death, whereas cells pre-treated with DHA showed greater sensitivity to VP16 in both MB cell lines. A pathway specific oligo array was used to illustrate the mechanism by which DHA and VP16 in combination limits MB cell proliferation. Results: The results demonstrated that the combined effect of DHA and VP16 on MB cells is partially due to the down-regulated genes from DNA damage repair and PI3K/MAPK pathways. Implications: In conclusion, our data suggest that combining anticancer drugs with DHA might benefit in the treatment of various brain tumors.

Importance of a Course to Enhance Pharmacy Students’ Readiness Against Biological/Chemical Disasters. Seher A. Khan, Lake Erie College of Osteopathic Medicine School of Pharmacy, Somnath Singh, Creighton University. Objectives: Deliberate or accidental release of pathogens and toxic chemicals has caused harm or death of humans and other lives. Given the enormous capacity of these noxious agents to cause mass destruction, we are interested to determine the current status of a didactic course offering in US pharmacy schools on readiness against biological and chemical disasters. Method: The contact information for the Chairs of Pharmaceutical and Clinical Sciences was obtained from the current AACP Faculty Roster. The Chairs were then invited electronically to complete a 9-item online survey utilizing the BlueQ software (Vovici Corporation). Follow-up emails were sent twice over a period of four weeks for those who did not participate initially. Descriptive statistics were utilized to analyze the data. Results: The survey resulted in 67 responses. Ten percent respondents considered the need of a didactic course on biological and chemical disaster preparedness to be extremely important while 3% considered not important at all. Six schools offer an independent course on preparedness against biological and chemical disaster with the course being offered annually in 66% cases. Two out of the six independent courses were required courses. The students were then able to ask the panel questions. Students completed evaluations based on defined learning outcomes. Additionally, as part of the course requirement, many students chose to write a self reflection on the experience. Results: Survey questions were evaluated using a Likert Scale (1 = strongly disagree; 5 = strongly agree). Students reported that they could: describe methods for showing respect to a transgender patient (SA/A = 96%), identify barriers to treatment for transgender patients (SA/A = 86%), and develop strategies for advocating for the healthcare of transgender patients, at a local level (SA/A = 84%). Implications: Educating future pharmacists about transgender patients is a first step in addressing the healthcare needs of this underserved population. Our panel may serve as model for other pharmacy schools to implement.

Inducible cAMP Element Repressor (ICER) Co-localization with the Kappa Opioid Receptor (KOR) in the Rat Forebrain. Helmut B. Gottlieb, University of the Incarnate Word. Objectives: The goal of this study is to examine whether changes in gene expression caused by kappa opioid receptors will affect salt and water imbalance. Activation of these receptors has been associated with an increase in factors (i.e., ICER) which subsequently reduce second messengers in the central nervous system (CNS). This could potentially cause free water diuresis via inhibition of vasopressin and activation of renal sympathetic nerves. However, the CNS sites involved in these responses are yet to be determined. Method: Rats were implanted with an intracerebroventricular cannula for central microinjection of drug/vehicle. Urine samples were collected during control (15-min) and after saline vehicle (VEH, n=8) or U-50488H (USO), selective kappa agonist (10 microg; n=8). 4 additional urine samples (15-min) were collected after the microinjection. The forebrain was processed for ICER, KOR and vasopressin using polyclonal antibody. Results: As compared to control, U-50 produced a rapid and marked increase in...
in urine flow and decrease in urinary sodium excretion rate. U50 produced significant increases in ICER expression in a number of hypothalamic regions (all P < 0.05). In addition, double labeling shows significant increase in ICER/KOR positive cells. Implications: This is the first study to show co-localization of ICER with the kappa opioid receptor in CNS regions involved in water homeostasis. Thus these results suggest a new pathway for kappa opioid-mediated effects on cardiovascular and renal function. The identification of these sites could be of considerable importance in treating a number of diseases, such as congestive heart failure. Supported by 1SC2HL104639-01A1.

Measurement of Critical Thinking Skills and Dispositions Before and After Advanced Pharmacy Practice Experiences. Joie Rollas, Midwestern University’s College of Pharmacy-Glendale. Objectives: To assess the critical thinking skills and attitudes of pharmacy students at the end of the didactic portion of the curriculum, and to see if these assessments changed after completion of the advanced pharmacy practice experiences (APPE). Method: Pharmacy students in their third (final) year were recruited voluntarily. The inclusion criterion was good academic standing. This study was approved by the MWU Institutional Review Board. The California Critical Thinking Disposition Inventory (CCTDI) and the Health Sciences Reasoning Test (HSRT) were administered shortly before the start of the first APPE, and again at the end of the final APPE (~ eight months later). The CCTDI measures the willingness to think critically. The HSRT measures critical thinking skills using a health science context. Test result data were analyzed using analysis of variance or Wilcoxon Signed Rank Test. Results: Thirteen students were enrolled (five males and eight females). Ages ranged from 26-41 years (mean 30.8 years). All participants completed the study. There was no significant difference for HSRT scores before or after APPE rotations (p = 0.519). Similarly, there was no significant change for CCTDI scores (p = 0.171). For both tests, the scores tended to be favorable and higher than reference norms and those reported for other pharmacy students. Implications: The lack of change in critical thinking skills and dispositions before and after APPEs does not necessarily indicate that these parameters are insufficient. Possible reasons for this lack of change are discussed. This study may provide information useful for remediation of students who fail APPEs.

Use of a High-Throughput Assay to Emphasize Key Concepts in Drug Metabolism and Drug Interactions. Wendell S. Akers, Lipscomb University, Susan L. Mercer, Lipscomb University. Objectives: In this laboratory-based exercise, students were given three unknown compounds to evaluate their potential interaction with CYP2C9 using a high throughput in vitro assay. Method: Assay components were prepared ahead of time and students were assigned to groups of four to perform the assay in a 96-well plate format. Test reactions were designed to examine the concentration-dependent effect of each test compound (0.1 - 100 micromolar) on inhibiting CYP2C9 activity. The assay contained human recombinant CYP2C9 enzyme, a luminogenic CYP2C9 substrate, an NADPH regeneration system, and a luciferin detection reagent. The CYP2C9 enzymes acted on the luminogenic substrate to produce a luciferin product that generated light. The intensity of light produced was proportional to the amount of luciferin generated and served as an index of CYP2C9 activity. Results: Student results from this experiment indicated that Compound A was not an inhibitor of CYP2C9 activity. However, both Compound B and Compound C inhibited CYP2C9 in a concentration-dependent manner, with an IC50 of approximately 3-5 micromolar. Based on these findings, students predicted a potential pharmacokinetic drug interaction for Compound B and C. Implications: The use of aspirin (A), ketoconazole (B), and warfarin (C) as prototypical drugs for this laboratory provided students with clinically relevant pharmacokinetic and pharmacodynamic drug interactions to consider through an active learning process requiring problem solving skills. This integrated laboratory exercise was an efficient, cost effective teaching method that reinforced fundamental concepts related to enzyme kinetics, drug metabolism, and drug clearance taught in lecture-based courses during the first year of the professional program.

Theoretical Models

Building on the Thermodynamics of Drug-Receptor Interactions throughout an Iterative Curriculum. Richard H. Alper, Saint Joseph College, Maria A. Summa, Saint Joseph College, Mark A. Sweezy, Saint Joseph College. Objectives: To develop evolving case studies featuring thermodynamic concepts for targeted application within the first two years of a three-year PharmD program. Method: All Saint Joseph College School of Pharmacy faculty met in formal weekly meetings to establish course titles, content, and pedagogical models most appropriate for a three-year, post-baccalaureate PharmD program. An overarching goal was the integration of foundational and clinical science concepts throughout the curriculum. Frequent informal discussions, fostered by the juxtaposition of the faculty offices, assisted in the development of the iterative case studies. Results: The thermodynamics of ligand-receptor interactions will be introduced in an activity on cell surface proteins in biochemistry. This concept will be presented in a case based format, designed to focus the students’ attention on the clinical relevance of quantifying drug-receptor interactions. This same case will act as the stem for activities focusing on different concepts critical to the practice of pharmacy such as cell signaling in biochemistry (signal transduction, receptor agonists and antagonists, receptor specificity, and drug potency and efficacy), in vitro and in vivo differences in potency, quantal dose-response curves and therapeutic index in introductory pharmacocconversion, throughout P1 in mechanism-based pharmacology courses to emphasize the pharmacology, medicinal chemistry and mechanism-based adverse effects, and finally in P2 pharmacoatherapeutics courses to emphasize the science and artistry of the clinical indications and uses of medicines. Implications: Iterative case studies are an active learning model effective in the development of critical thinking skills necessary for the scientific and professional proficiency of 21st century pharmacists.

Work in Progress

A Survey of College of Pharmacy Deans Regarding Biotechnology in Pharmacy Education. Melanie A. Jordan, Midwestern University’s College of Pharmacy-Glendale, Seher A. Khan, Lake Erie College of Osteopathic Medicine School of Pharmacy. Objectives: The Accreditation Council for Pharmacy Education (ACPE) standards highlight Biotechnology as one subject area to be included in core and/or elective coursework. Given the implication of a required biotechnology component in pharmacy education, an analysis of current and future expectations for the inclusion of biotechnology-related material in pharmacy curricula is warranted. Therefore, the objective of this research is to administer a prospective study using survey data solicited from Deans of U.S. Colleges/Schools of Pharmacy to explore attitudes and expectations for inclusion of biotechnology in pharmacy education. Method: Deans of Colleges and Schools of Pharmacy in the U.S. will be electronically invited to participate in an online anonymous survey utilizing Qualtrics software

(Qualtrics, Inc.). Survey items soliciting opinion will include the quantity of biotechnology material, type of course for teaching biotechnology (required versus elective), and future prospects for biotechnology in pharmacy curriculum. Descriptive statistics will be used to analyze the data. Results: This study is a work in progress. Final results will be presented at the 2011 Annual Meeting. Implications: Deans serve as leaders and facilitators for faculty in the development of curricular change. An assessment of attitudes and expectations towards biotechnology in the curriculum, in concert with ACPE standards, is therefore necessary for curricular development in this area.

An Integrated Biomedical and Pharmaceutical Sciences Teaching Laboratory for First-Year PharmD Students. Michael W. Fowler, Lipscomb University; Joseph E. Deweese, Lipscomb University; Holli H. Dilks, Lipscomb University; Susan L. Mercer, Lipscomb University; Steve D. Phipps, Lipscomb University; Jeffrey M. McCormack, Lipscomb University; Wendell S. Akers, Lipscomb University.

Objectives: To develop and implement an integrated biomedical and pharmaceutical science teaching laboratory course for first-year PharmD students. The laboratory experiences will be used to teach pertinent laboratory safety, data handling, graphical and statistical analysis procedures, to enhance didactic lecture content in biomolecular chemistry, physiological basis of therapeutics, microbiology, immunology, pharmaceutics, biopharmaceutics and pharmacology, and to stimulate interest in basic and applied biomedical and pharmaceutical research. Method: A series of laboratory experiences utilizing multiple learning processes such as wet labs for protein and nucleic acid analysis, microbiological isolation, staining and antibiotic sensitivity testing, computer-assisted simulation for several physiologic systems and focused pharmacological applications, drug design using computer-assisted molecular modeling, and pharmaceutical analysis using drug dissolution experiments will be used to introduce, integrate and stimulate learning. Most laboratory experiences will be performed by small groups and will focus on developing team work and coordination of activities. Students will be assessed by various methods including pre- and post-laboratory quizzes, formal laboratory reports, data acquisition and focused assessment questions, development of group-produced and presented PowerPoint presentations. Results: Student assessment will include required evaluation as to appropriateness of material covered, relevance of, interest in and stimulation by and intellectual challenge of the course experiences, assignments, and evaluations. Implications: Student assessment responses will be used to improve laboratory experiences by modifying or substituting laboratory experiments or activities and to assess whether this approach of integrating the basic biomedical sciences and pharmaceutical sciences is a viable pedagogical technique.

Establishment of a Protocol for Efficient Anti-HSV Drug Discovery Using HSV-1 Expressing GFP. Matthew D. Balish, University of Maryland Eastern Shore; ShaoChung V. Hsia, University of Maryland Eastern Shore.

Objectives: Our goal is to set up a reproducible methodology for screening potential HSV-1 antivirals using cornea derived SIRC cells. Method: Antiviral activity of candidate compounds against HSV-1 was tested in vitro on VERO and SIRC cells using our HSV-1 GFP infection assay. This assay uses an HSV-1 virus expressing green fluorescent protein (GFP) and the infected cells can be easily detected by fluorescent microscopy. In addition, this protocol includes evaluating cyto-toxicity on both VERO and SIRC cells, using traditional cytotoxic effect (CPE) and a celllert-glo luminescent cell viability assay. The 50% inhibitory concentration (IC50) for each compound was calculated. Lead compounds were further evaluated by traditional plaque reduction assay. Furthermore, RT-PCR was performed to investigate viral gene expression in response to drug treatment and the viral copy number can be quantified by real time PCR to determine the reduction of viral replication. Once a promising lead compound is identified further work to elucidate the antiviral mechanism will commence. Results: We have identified one compound with potent anti-HSV activity. Currently we are analyzing 35 more compounds for antiviral activity, and would be interested in testing other candidates using this method. Implications: Herpes simplex virus-1 (HSV-1) is a double-stranded DNA virus that causes diseases such as herpetic keratitis, etc. HSV-1 keratitis is the leading cause of corneal blindness in US. Nucleoside analog drug (acyclovir) resistance indicates a continuing need for new antiviral drugs to combat herpes viral infections of the eye in man.

Examination of Learning Strategies in a Pharmacology Course for Nursing Students. Teresa M. Seefeldt, South Dakota State University; Joe Strain, South Dakota State University; Karly A. Hegge, South Dakota State University; Kaitlyn Baier, South Dakota State University.

Objectives: Pharmacology for nursing students may be taught by pharmacy faculty; the method of course delivery varies by program. The major objective of this study was to evaluate learning of nursing students enrolled in a pharmacology course. Specifically, the perceptions of nursing students regarding pharmacology education and learning methods used in the different modes of course delivery were examined. Method: A survey was developed and administered to nursing students taking pharmacology in traditional face-to-face and online sections taught by College of Pharmacy faculty. The students were asked about their perceptions of pharmacology courses, how the mode of delivery impacted learning, and the specific learning strategies or tools that students were using to learn pharmacology. Results: The survey was administered over three semesters and will be given again in Spring 2011. Preliminary analysis of the data indicates that the students in both sections found frequent quizzes and ungraded self-assessment activities to be the most helpful in learning pharmacology. In addition, the students in the online section appreciated the availability of recorded lectures. More of the online students felt that the mode of delivery had a negative impact or no impact on their learning while most of the face-to-face students described a positive impact on learning from the delivery method. Implications: The results of this project will provide valuable information for faculty teaching pharmacology courses to use in course design and decisions on delivery methods.

Integration of Medicinal Chemistry, Pharmacology, and Pharmacotherapeutics Courses in PharmD Curriculum: Students’ Perception. Mohammed A. Islam, Lake Erie College of Osteopathic Medicine School of Pharmacy; Teresa A. Schweiger, Lake Erie College of Osteopathic Medicine School of Pharmacy.

Objectives: At LECOM Bradenton School of Pharmacy, we have developed an integrated approach of teaching medicinal chemistry, pharmacology, and therapeutics courses based on organ system disorders and specific disease states. Medicinal chemistry and pharmacology are combined as one course and taught sequentially with therapeutics over three semesters. This approach of integration bridges the traditional separation of basic and clinical sciences related to drug therapy. The overarching goal of this integration is to help students learn most effectively and apply this knowledge to achieve improved clinical outcomes. The aim of this study is to determine students’ perceptions regarding this integrated approach of teaching. Method: A survey was developed with emphasis on the students’ perceptions about the purpose and importance of the integration, the allotment of time for each component, redundancy of content, effectiveness of the integration, and whether
the students were able to apply integrated knowledge to solve therapeutic problems. Current P2 to P4 students participated in the survey. The respondents indicated their degree of agreement with the individual statements using the Likert Scale. **Results:** Survey data and analysis will be presented in July 2011. **Implications:** The results of this study will help to determine whether students felt the integrated approach of teaching medicinal chemistry, pharmacology and therapeutic courses in the PharmD curriculum enhanced students learning outcomes and helped them understand the core concepts in each topic. In addition, students will identify whether this teaching method facilitated their ability to solve clinical problems during APPE rotations.

**Palindrome Learning and Assessment: An Alternate Didactic Teaching and Learning Process.** Reza Karimi, Pacific University Oregon. **Objectives:** A Palindrome Learning and Assessment (PLA) process has been developed to enhance and assess student learning in a didactic curricular setting. **Method:** A pilot study was designed to deliver didactic materials related to biochemistry and pathophysiology in diabetes to first year pharmacy students. Students were provided big picture ideas and then materials were gradually and reversely delivered back to details and starting points. In addition, a series of assessment questions were embedded into the palindrome process to concurrently assess student learning. A brief survey was implemented to assess the effectiveness of the PLA process. **Results:** Our initial qualitative and quantitative results from the implemented survey indicated that approximately 70% of students agreed the PLA process provided palindrome learning, facilitated didactic learning of presented materials, and effectively assess student learning. In addition, the qualitative results indicated that students appreciated the PLA process to learn the didactic materials. Furthermore, the embedded assessment questions assisted students and faculty to assess student learning. **Implications:** Students found the PLA process to be an effective student learning tool. The initial results indicated that the PLA process can be applied to didactic materials in which complex presentations can be presented in a palindrome fashion to promote and assess student learning. The overall results were sufficiently encouraging to build on this pilot study. As a result, further development is in progress to evaluate the impact of the PLA process to other aspects of student learning.

**Pharmacology Teaching in Pharmacy Programs of Canada.** Seher A. Khan, Lake Erie College of Osteopathic Medicine School of Pharmacy, Seher A. Khan, Lake Erie College of Osteopathic Medicine School of Pharmacy. **Objectives:** Apart from Québec province, the entry-level pharmacy degree in other Canadian provinces is a Bachelor of Science degree in pharmacy. The current study was designed to provide an overview of how pharmacology is taught in the BS in Pharmacy programs at different pharmacy schools with a focus on the organization of course contents, delivery methods and assessment. We were also interested to determine whether the course(s) is taught in an integrated or sequential manner with medicinal chemistry and/or pharmacotherapeutics courses. **Method:** Initially, a 10-item online anonymous survey was administered to obtain details from the course instructors. With the survey response being unsatisfactory, we have decided to gather additional information from individual pharmacy school’s website. **Results:** Currently data is being collected. Final results with descriptive statistics will be available in a few months. **Implications:** Data from the study will help us understand the similarities and differences in pharmacology education between pharmacy schools of Canada and the United States. With the increased interest of US-Canada cooperation on pharmacy education, the information presented here may have some significance.

**Pharmacy Education in Bangladesh.** Mohammed Islam, Lake Erie College of Osteopathic Medicine School of Pharmacy, Seher A. Khan, Lake Erie College of Osteopathic Medicine School of Pharmacy. **Objectives:** Pharmacy program was first introduced in 1963 as a three-year Bachelor of Pharmacy (BPharm) degree program in the University of Dhaka. A few years later a one-year Master of Pharmacy (MPharm) program was incorporated in the curriculum. Till early 1990s, the University of Dhaka was the sole institution of the country imparting education and training on pharmacy profession. However, during the last two decades, there has been a rapid increase in the number of institutions offering pharmacy education. Currently, a total of 20 universities in Bangladesh are offering four-year BPharm programs. The objective of this study is to discuss different components of the curriculum including structure, course content, evaluation, methods of instruction, language of instruction, and grading criteria of BPharm and MPharm programs. Side by side we are interested to determine the extent of clinical pharmacy courses in these programs. **Method:** Program information was obtained from different university websites as well as from hard copy program brochures. Currently, data are being analyzed using descriptive statistics. **Results:** Preliminary analysis indicates that pharmacy programs in Bangladesh focus heavily on basic pharmaceutical sciences with minimal emphasis on patient-centered pharmacy care. Detailed results of this study will be presented at the AACP Meeting in July 2011. **Implications:** Unlike US Pharmacy programs, Bangladeshi pharmacy programs are geared towards preparing the students to work in the pharmaceutical manufacturing and marketing sectors. Opportunities exist to introduce additional courses focusing on clinical and pharmaceutical care aspects of the pharmacy profession.

**Safety Labeling Changes of Drugs in 2009:** Evaluation of Boxed Warnings. Seher A. Khan, Lake Erie College of Osteopathic Medicine School of Pharmacy, Ashok E. Philip, Union University, Christopher Andreason, Lake Erie College of Osteopathic Medicine School of Pharmacy, Chi Li, Lake Erie College of Osteopathic Medicine School of Pharmacy. **Objectives:** Based on clinical safety data, the Food and Drug Administration periodically issues updates to a drug’s boxed warnings, contraindications, warnings, precautions, adverse reactions, and patient package insert/medication guide. These labeling changes detail serious and life-threatening complications that may result from the use of a therapeutic agent. The goal of this study is to derive an overall picture of the issued boxed warnings of drugs in 2009 with an emphasis on evaluating these warnings by organ systems. **Method:** Information was collected from the FDA website (www.fda.gov/safety/medwatch) and individual package inserts. These boxed warnings were then categorized by specific organ systems that are affected according to the labeling revisions. Two student pharmacists were also involved in this project. **Results:** Analysis is in progress. Tabulated data of total number of boxed warnings, boxed warnings/month over the year, and deleterious effects of different therapeutic agents on organ systems will be available by May. **Implications:** Pharmacy students/practioners and other health-care providers are constantly presented with a multitude of information pertaining to the safety of drugs. Keeping up with a vast array of information is critical for assessing the safety of a drug as well as for appropriate drug therapy management. This simple approach will assist the pharmacy students and practitioners/health-care providers to acquire a comprehensive picture on the boxed warnings and engage them into learning the details.

**Student Involvement in a Structured Research Program.** Celia A. Proctor, Harding University, Kenneth Yates, Harding University. **Objectives:** Harding University College of Pharmacy is continuing
to develop a structured research elective with a variety of options for student pharmacists with the purpose of preparing students to have foundational knowledge related to basic research skills as well as create awareness of the value of inter-disciplinary research. Method: Students with a GPA of 2.75 or better and departmental chair approval are able to enroll in a faculty mentored research program. Once a student is enrolled and successfully completes the elective, their grade as well as the title of their research is recorded as part of their transcript. A weighted rubric outlining specific tasks to be achieved over the course of the elective is used by faculty for grading. Each student presents their respective project and progress during a formal presentation to research students and faculty advisors at semester’s end. Results: Over the past three semesters since implementing this program, the college has had 33 students participate. Year one of the program saw an increase from three students to 16 students for the semester following implementation. The second year has remained relatively unchanged with 17 students participating representing 16% of eligible students. Of these, six students have participated in interdisciplinary research. Implications: The response for this approach has been extremely positive and fosters awareness of the benefits of basic as well as inter-disciplinary research. In addition, faculty are supported in their scholarship endeavors along with creating a positive mentoring experience fostering interest in students to become future faculty.

Student-led Learning in the Pharmaceutical Sciences Curriculum. Melinda Lull, St. John Fisher College; Jennifer L. Mathews, St. John Fisher College, Erin C. Jannetta, St. John Fisher College, Christine R. Birnie, St. John Fisher College. Objectives: A challenge of primarily didactic courses lies in keeping students engaged in a potentially monotonous learning environment. The objective of this study was to test the effectiveness of incorporating student-led activities into the pharmaceutical sciences curriculum. This alternative approach to traditional lecture-based learning allows for student engagement and ownership of materials. These activities were incorporated into P1 Pharmacology, Biosystems, and Calculations courses. Method: A variety of student-led learning activities were conducted in three courses (n=78 students). Following each activity, students were asked to participate in a survey rating the effectiveness, relevance, productivity, and overall impression of the activity using a Likert scale of 1-5 (1= strongly disagree; 5 = strongly agree). Additionally, exam scores from relevant material were analyzed from the current semester and previous semesters as an indirect indication of success of the activity. Results: For the three courses where student-led learning activities were incorporated, students responded that the topics were relevant to their studies (4.78), having the material presented in a different way was beneficial (3.89), and they would recommend conducting the sessions in the future (3.88). Exam scores did not show any statistically significant increase from the previous year, but qualitative data suggests the students benefited from the introduction of these activities. Implications: Student-led learning activities in pharmaceutical sciences courses, as evaluated by student impressions, are a successful way of reinforcing classroom topics and presenting information from a different perspective. They also serve as a productive way to introduce learning variation even in large class sizes.

Use of Computer-Assisted Simulations to Teach Cardiac Physiology and Introduce Cardiac Pharmacologic Principles. Michael W. Fowler, Lipscomb University; Catherine B. Terry, Lipscomb University. Objectives: Utilize and determine the effectiveness of a small group use of a commercial, interactive, computer-assisted instructional package to teach first-year PharmD students the basics of cardiac physiology and introduce students to normal physiologic and pharmacologic effectors of cardiac function. Method: Use PhysioEx 8.0 for Human Physiology: Labortory Simulations in Physiology to present principles of cardiac dynamics including the effect of vessel radius, viscosity, and pressure on blood flow and the effect of vessel radius and stroke volume on heart pump activity and the process of cardiac compensation. A second module will introduce the concepts of automaticity and rhythmicity of cardiac muscle compared to skeletal muscle and investigate the physiologic effects of vagus nerve stimulation, temperature, calcium, sodium and potassium ion concentration and pharmacologic effects of pilocarpine, atropine, epinephrine, and digitalis on cardiac function. Students will work in small groups of 4 or 5 on the simulation. Data will be obtained and analyzed and pertinent questions provided for each group to answer. Results: Students will be evaluated individually as to the effectiveness of this learning approach via pre- and post-lab assessment of presented concepts. Student acceptance of this pedagogical technique will be evaluated by a multi-question evaluation of the laboratory exercise. Implications: The outcome of this study - student performance and student acceptance - will be used to modify and improve the approach to teaching cardiac physiology and introducing concepts of cardiac physiology.

Utility of Creating and Solving Cases via Electronic Mobile Devices in a Biological Science Laboratory. Jennifer E. Bryant, Shenandoah University, Craig A.H. Richard, Shenandoah University. Objectives: To assess pharmacy student perceptions of the utility of creating and solving case studies via electronic mobile devices. Method: A weekly project was given to 56 first-year pharmacy students in a biological science laboratory course. Groups of students were each given a different disease state and were instructed to only use their iPhones or iPod Touches to access resources and create a case study for another group. Groups then exchanged case studies and solved them only utilizing their iPhones or iPod Touches. A survey was created and administered to the students at the end of the semester. The survey inquired about perceived changes to the general understanding of the material, the value of mobile devices to the process, and the potential ability of mobile devices to improve health care. Results: Response rate was 100 percent. Ninety-three percent of students agreed or strongly agreed that the case studies increased their general understanding of the clinical application of the lab material. Eighty-six percent agreed or strongly agreed that the mobile devices were valuable to the case study process. Ninety-five percent agreed or strongly agreed that mobile devices can improve patient health care if utilized by pharmacists to access clinical information. Implications: Most students viewed the creating and solving of case studies via mobile electronic devices as valuable to their learning process and helpful to their ability to improve health care as a future pharmacist.

Vitamins and Minerals: An Elective Course for PharmD Students. Mohammed Islam, Lake Erie College of Osteopathic Medicine School of Pharmacy. Objectives: The major goal of this study is to discuss an elective course that allows pharmacy students to scientifically assess the potential benefits and risks associated with the consumption of vitamins and minerals as dietary supplements available in the health stores. The course content and instructional details, assessment of student learning, students’ perceptions of the course, and its implications on pharmacy practice will be discussed. Method: An innovative two credit-hour elective course on vitamins and minerals was developed and implemented for 2nd and 3rd year Doctor of Pharmacy students at LECOM Bradenton School of Pharmacy in Fall 2009. The course was designed to provide the students with
a thorough understanding of the biochemical and physiological functions of vitamins and minerals, pathophysiological implications, and potential benefits and risks of consuming vitamins and minerals as dietary supplements. In addition to traditional classroom lectures, an active learning component was incorporated in each two-hour session for small group discussion on the materials covered during lecture. Students were evaluated by three examinations. At the end of the course, student perceptions were collected via web-based surveys.

**Results:** Preliminary analysis of data indicates that the course was well received by the students. Students rated the course as very useful for practice as pharmacists. Students recommended this course be part of the core curriculum. Detailed results of this study will be presented in July 2011. **Implications:** This course helps students to acquire knowledge and competence in patient counseling to ensure safe, appropriate, effective, and economical use of vitamins and minerals as dietary supplements.

**CHEMISTRY**

**Completed Research**

**Analysis of a Model Receptor and Drug Design: An Integrated Biomedical Sciences Laboratory Experiment.** Susan L. Mercer, Lipscomb University. **Objectives:** A drug design experiment was developed to emphasize fundamental concepts in organic functional groups, acid/base chemistry, solubility, bonding interactions and ligand-receptor interactions delivered in didactic courses within the first year of the professional pharmacy curriculum. The goal of this experiment was to have students apply their knowledge and comprehension regarding these fundamental concepts and demonstrate the complexities involved with drug design and development. **Method:** Students utilized the CambridgeSoft ChemBioOffice software package to analyze a model receptor, develop a pharmacophore based on the receptor structure, and design a ligand which reproduced the features of the pharmacophore. Due to the complexity of target sites, a modified Rebek’s diacid was provided as the model receptor. **Results:** In groups of four, students first analyzed the model receptor for H-bond donor/acceptor capabilities, hydrophobic regions and internal distances/geometries. This 3-dimensional information was applied towards the development of a pharmacophore, reciprocal to the model receptor. The pharmacophore was then utilized to design a novel ligand for the receptor. Students then “pseudo-docked” the ligand into the model receptor to verify the appropriate 3-dimensional interactions and discussed limitations their novel ligand may enunciate in the drug development process, such as solubility or metabolism issues. Evaluation of the students’ performance was assessed by the quality of their model receptor analysis, pharmacophore development, ligand design and justification of all work via a short formal laboratory report. **Implications:** Students gained an appreciation for the complexity of drug design, a more thorough understanding of ligand-receptor interactions and experienced integration of medicinal chemistry and pharmacology.

**Work in Progress**

**Auxiliary Labels: How Well do our Students Understand the Scientific Foundation?** Robin M. Zavod, Midwestern University’s Chicago College of Pharmacy, Valerie Ravenna, University of Wisconsin. **Objectives:** To evaluate student knowledge of the scientific rationale for the use of thirteen auxiliary or patient/drug labels. **Method:** A questionnaire was developed to evaluate student knowledge related to the scientific rationale for the use of thirteen specific auxiliary labels. In addition to demographic information, the survey included multiple choice and open ended items to identify previous auxiliary label exposure, previous auxiliary label counseling, and identification of the correct chemical rationale for label use. The survey was administered prior to the start of the medicinal chemistry sequence to establish baseline knowledge and at the end of the sequence to evaluate acquired knowledge. **Results:** The baseline survey identified that over 80% of respondents (N = 190/194) have pharmacy work experience, 75% of which were employed for > 1 year. More than 60% of respondents saw 11 of the 13 labels used, however only heard counseling points offered for five labels. Only 41% of the students correctly identified the chemical principle for the “Do not Crush/Do not Chew” label. For other labels the correct response was identified by <5% of the respondents. Post-course sequence data analysis is ongoing. **Implications:** Delivery of quality patient-centered care requires that pharmacists understand the scientific rationale for inclusion of auxiliary labels on prescriptions. Optimal therapeutic outcomes can only be achieved if patient compliance is maximized and potential drug-drug, drug-food and/or drug-nutraceutical interactions are minimized. Data from this survey will guide course sequence modifications to enhance student pharmacist awareness of the scientific rationale associated with the use of auxiliary labels.

**Building an Assessable Curricular Infrastructure through Inclusion of a Drug Entity Curricular Map.** James G. Henkel, Saint Joseph College, Maria A. Summa, Saint Joseph College, Bruce Edgren, Saint Joseph College, Natalie Dearing, Saint Joseph College, Sukhvir Kaur, Saint Joseph College, Annette Podgorski Hood, Saint Joseph College, Cory Fominaya, University at Buffalo, The State University of New York. **Objectives:** Curriculum mapping is widely employed in higher education to support vertical and horizontal alignment of core programmatic outcomes, assessments, content, and methods to improve curricular delivery. To support this process, we created a map of drug substances aligned pharmacologically and therapeutically to courses, thus adding another dimension to our programmatic outcomes and standards. This map contributes to an infrastructure for data-driven curricular decisions. **Method:** A list of approximately 73,400 drug substances derived from the National Drug Code Database was reduced to 1,537 unique drug entities by eliminating duplicate drug products and dosage forms. Faculty assigned the drugs to one or more courses, each with a coverage code of “none,” “brief,” “basic,” “intermediate,” or “advanced.” Drugs deemed unworthy of class time due to therapeutic obsolescence were archived. **Results:** The outcomes of this process include (1) a clear understanding by faculty of where each drug is covered in the curriculum and the associated level of coverage, (2) an effective way to identify and resolve gaps in course content and coverage level, (3) a framework that will guide students as they learn drugs’ names, mechanisms, and therapeutic characteristics, and (4) a rational definition of a complete population of drugs from which subsets can be drawn. **Implications:** Our modified block scheduled, three-calendar year curriculum does not have a “Top 200 Drugs” course; rather it relies on systematic and iterative coverage of an appropriate subset of drugs throughout the curriculum. This enhanced curricular mapping process accomplishes this and should improve curricular delivery and elevate our graduates’ performances.

**Concept Mapping to Facilitate an Understanding of Drug Metabolism.** Patrick J. Davis, The University of Texas at Austin. **Objectives:** The objectives of this exercise are (1) to introduce the process of concept mapping early in the pharmacy curriculum as a tool for integrating intra- and interdisciplinary material; and (2) to introduce the study of drug metabolism as a framework of integrated chemical,
biological, and therapeutic concepts. **Method:** Concept mapping is introduced in the Medicinal Chemistry Laboratory (PHR143P) following the didactic coverage of drug metabolism (PHR143M), a computerized laboratory for predicting and rationalizing individual metabolic pathways, and a capstone lab focusing on the composite picture of drug metabolism and its consequences. In this third metabolism lab, students first work as a class to ‘brainstorm’ concepts and terms, then work in groups of 2-3 to consolidate concepts, and then individually to construct their concept map based on their own understanding of these concepts and their interrelationships. **Results:** Students (particularly visual learners) quickly grasp the concept mapping process, and can easily see application relating to curriculum mastery. The process includes exposure to group versus individual mapping (each has merit), and strategically placed examples illustrate the value of this process in identifying and correcting conceptual errors (the ‘eureka’ moment). **Implications:** Students are introduced to basic learning theory and learning style preference in the P1 year. Concept mapping represents the third component aimed at helping students understand how they learn, and how best to integrate information. For those students (and faculty) that find concept mapping to be a useful tool, it is expected that they will incorporate it throughout the balance of the curriculum.

**Design, Implementation, and Evaluation of an Interdisciplinary Pain Management Elective Course.** Ashok E. Philip, Union University, Amy Robbins Williams, Union University. **Objectives:** To develop and evaluate the effectiveness of an interdisciplinary pain management elective course that incorporates principles of pharmacy practice and basic sciences (medicinal chemistry and pharmacology). Pre- and post course surveys will be administered to assess student attitudes, core knowledge, and clinical practice skills in regards to pain pharmacotherapy. **Method:** The course was designed to provide the students with an in-depth perspective of pain pharmacotherapy, taught by both basic sciences and pharmacy practice instructors. In-class lectures are delivered in an engaging “tag-team/pardon-the-interruption” manner, incorporating medicinal chemistry and pharmacology principles with clinical pharmacy pearls as it relates to opioid drug selection, equianalgesic opioid dosing principles and managing opioid-related adverse effects and toxicities. Additional topics covered in the course include pain assessment, pain syndromes, and palliative pharmacotherapy. Anonymous pre- and post-course surveys will be administered to measure effectiveness of this approach and student application skills **Results:** Twenty-first year pharmacy students are currently enrolled in this Spring 2011 elective course. Data from the pre-course survey will be compared with the post-course survey and results will be presented at the annual meeting in July. **Implications:** Pain management is a critical component of pharmacy education. Efforts to effectively deliver an in-depth perspective of pain pharmacotherapy are vital to the development of a competent pain pharmacy practitioner. We believe students will develop a greater understanding of pharmacotherapy principles when basic science principles are coupled with pharmacy practice principles in one course. Assessment results will help refine the delivery approach and guide development of other integrated pharmacotherapy courses at our school.

**Organizing and Assessing Medicinal Chemistry and Therapeutic Chemical Knowledge.** Cory R. Theberge, University of New England. **Objectives:** 1. To review a variety of techniques for assessing student knowledge of the therapeutic consequences of chemical structure. 2. To consider the advantages and disadvantages of grouping subject matter by therapeutic area vs. mechanism of action. 3. To estimate impact on NAPLEX study preparations. **Method:** Data analysis of the presentation of data to students grouped by therapeutic area vs. mechanism of action is studied. Particular attention is paid to promiscuous chemical classes that are difficult to categorize. Group problem solving assignments are assessed as a useful tool for discussion and active learning within a limited time frame. **Results:** Group problem solving and generation of sample questions was determined to an excellent means of reinforcing and connecting individual chemical concepts. Organization of the subject material by therapeutic area was preferred by students, but basic chemical concepts are more easily reinforced when applied out-of-context (disconnected from drug examples). **Implications:** The information generated provides a perspective on the organization of a medicinal chemistry course, and helps clarify what important topics define the course more broadly as “chemical therapeutics”. The challenges encountered when teaching chemistry as a NAPLEX preparation are discussed.

**Pharmacy Student Background as a Predictor of Academic Success in an Accelerated Pharmacy Program.** Arthur G. Cox, South University, Launa M. Lynch, South University, Melissa C. Jones, South University, Lilia Z. Macias-Moriarity, South University. **Objectives:** This study was designed to evaluate the correlation between student background and academic success in an accelerated pharmacy curriculum. Factors being considered in the current study include 1) prior Bachelor degree; 2) student’s GPA; 3) prior experience as a pharmacy technician, and 4) Pharmacy College Admissions Test (PCAT) scores. PCAT subtest scores were correlated with student GPA in key didactic courses. One subset of particular interest was the Writing Problem Solving Score. The predictive power of this relatively recent subtest has not been examined previously. **Method:** Background data from application packets was collected for 269 students with projected graduation dates of 2010, 2011, and 2012. Grades were also collected for Biochemistry I and II, Pharmaceutics I and II, Basic and Clinical Pharmacokinetics. Core courses throughout the integrated curriculum were also examined. The student grades were stratified for purposes of analysis. Correlation analysis was performed on PCAT subtest scores and student GPA using IBM® SPSS® Statistics software. **Results:** Preliminary results indicate significant correlations (p<.05) between student success in Pharmacokinetics and several PCAT subtest scores. However, prior Bachelor degree does not correlate with success in this course. **Implications:** PCAT subtest scores may be better predictors of academic success in certain areas than the composite score.

**CONTINUING PROFESSIONAL EDUCATION**

**Completed Research**

**Bridging Faculty and Staff Needs with Professional Development Programming.** Claire Saadeh, Ferris State University, Allison Bernknoof, Ferris State University, Mandy Seiferlein, Ferris State University, Todd Stanislav, Ferris State University. **Objectives:** The goals of the Professional Development Program are to 1) Support the success of all faculty in the COP by providing workshops and other learning opportunities on teaching, scholarship, and service; 2) Support and advance the professional development of staff; and 3) Meet ACPE Accreditation Standards. **Method:** The PDC consists of four faculty members, one administrator, a consultant from the Faculty Center for Teaching & Learning (FCTL), and one staff member. Programming for each academic year is determined by a needs assessment survey that is completed by faculty members at the end of the previous academic year. A staff needs assessment survey is currently under development. The three main areas of this program include:
mentoring. Support staff, opportunities for collaboration between departments, and disciplines. Future enhancements of this program include sessions to promote the awards of faculty in the college of pharmacy. Implications: The creation of the committee has shown that the college is committed to providing ways for faculty to continually educate themselves. The need for faculty development in the future will continue to grow and a formal committee will help address these needs as they arise. Many colleges of pharmacy are facing a shortage of faculty; this is one strategy that may help retain faculty and increase the quality of their work.

**Incorporation of Preceptor Development into the Required Community APPE Rotations.** Pamela H. Koerner, Duquesne University, Janet Astle, Duquesne University. Objectives: The objective of this model was to identify a unique way that the school could infuse a structured preceptor development program into the community APPE rotations. Method: ACPE states that professional development programming needs to be directed at experiential preceptors. For the required community APPE rotations, students are required to come to campus for group presentations. A group of approximately 6 students, under the direction of a faculty facilitator, meet weekly to review patient care cases, discuss journal club articles and assess community-based projects. In addition to the students, the community preceptors are also invited to be a part of the group discussions. They are asked to attend at least once per rotation block. Results: Preceptor’s attendance allows them to provide the experiential students with additional community experiences. This insight is highly valued by student pharmacists. However, their attendance also serves as a medium to provide education to the preceptors. Preceptors participate in review of key disease states via the student participation. They also hear the critique of faculty facilitators and additional information that is provided. Preceptors are also exposed to student discussions of community-based projects. These projects can then be taken back to their practice site to enhance programs already being conducted. Finally, they have the opportunity to review contemporary literature through journal club discussions and continue to develop their literature review skills. Implications: The inclusion of preceptors in weekly community rotation group meetings is an effective way to enhance student learning and to provide quality preceptor development programming.

**Theoretical Models**

**Creation of a Faculty Development and Recognition Committee.** Anne H. Metzger, University of Cincinnati, Pamela C. Heaton, University of Cincinnati, Alex H. Li, University of Cincinnati, Art Buckley, University of Cincinnati, Daniel Acosta, University of Cincinnati, Robert J. Cluxton, University of Cincinnati. Objectives: To describe the creation and results of a faculty development and recognition committee in a College of Pharmacy in order to address faculty development needs and meet ACPE accreditation standards. Method: A faculty development and recognition committee was formed in 2006 in order to assist faculty in strengthening their effectiveness in teaching, research, and leadership, and to facilitate recognition of faculty achievements. Specific committee charges include formalizing a mentoring process for new faculty, creating a new faculty handbook, planning content designed to enhance professional growth of faculty in accordance with the Strategic Plan of the College Outcomes, and planning recognition receptions for faculty who have achieved significant awards in teaching, scholarship, and service. Results: Since its formation, the committee has created a formal mentoring process that was approved by all faculty, and has organized several faculty development seminars, some funded by grants to bring expert speakers in to the college. Currently, the creation of an electronic faculty handbook is underway. Additionally, each year the committee organizes a way to promote the awards of faculty in the college of pharmacy. Implications: The creation of the committee has shown that the college is committed to providing ways for faculty to continually educate themselves. The need for faculty development in the future will continue to grow and a formal committee will help address these needs as they arise. Many colleges of pharmacy are facing a shortage of faculty; this is one strategy that may help retain faculty and increase the quality of their work.

**Work in Progress**

**An Exploration of Faculty & Student Learning Styles.** Mallory L. Garfield, Harding University, Emily Wagner, Harding University, Daniel H. Atchley, Harding University, Susan M. Grace, Harding University, Forrest L. Smith, Harding University. Objectives: Learning style preferences amongst faculty and students were compared and contrasted to encourage pedagogical dialogue emphasizing improved teaching and learning. Method: Faculty and students used Neil Fleming’s VARK (visual, auditory, read/write, kinesthetic) Learning Profile to assess their learning style preferences. All participants received a summary of their individual preferences, along with recommendations for improving learning. After de-identifying faculty and student learning preferences, summary data were presented at a faculty meeting to increase awareness of learning preferences and potential implications to teaching. Results: 164 (78%) students and...
Emergency Preparedness for Pharmacy: Meeting the Mandatory Continuing Education Requirement through a Multi-Media Approach. Trina J. von Waldner, The University of Georgia, Catherine A. White, The University of Georgia. Objectives: 1. Describe current methods of delivering continuing pharmacy education. 2. Identify assessment of learning activities appropriate to the level of the content presented (i.e. knowledge-based, application-based, and or practice based) and based on the method of content delivery (i.e. live, online, or monograph). 3. Evaluate outcomes of training based on demographic and practice background of pharmacists who completed the course. Method: In February of 2010 the Georgia Board of Pharmacy mandated that all pharmacists licensed by the state must obtain three hours of disaster preparedness training prior to relicensure on December 31, 2010. There are approximately 12,800 pharmacists registered with the Georgia Board of Pharmacy. The University of Georgia College of Pharmacy, Office of Postgraduate Continuing Education and Outreach developed a series of continuing education activities that could be delivered live, online or via DVD to meet this need. Over 7,500 pharmacists met the requirement through this series of courses. The research will compare learning outcomes assessed at the end of the course through use of the post-evaluation with those reported in an online survey administered 3-11 months after completion of the course. Results: Data from the research will help planners determine the appropriate method of instruction for this type of content. It will also examine the change or intent to change one’s practice based on the education. Implications: The analysis of data will serve as the basis for determining future educational needs of pharmacists in the area of emergency preparedness and the most appropriate method of content delivery.

Impact of CPE Activity Designed to Prepare Pharmacists to Provide Disease State Management Services. Jan K. Hastings, University of Arkansas for Medical Sciences, Anne C. Pace, University of Arkansas for Medical Sciences, Amanda S. Perry, University of Arkansas for Medical Sciences. Objectives: The purpose is to describe the results of an educational program designed to encourage collaborative practice between pharmacists and physicians via written protocol. Method: The State Board of Pharmacy requires that pharmacists be credentialed to engage in Disease State Management. A continuing pharmacy education (CPE) activity was developed to teach best practices for developing a collaborative practice using written protocols. A survey, distributed to all pharmacists who have completed the CPE activity, will obtain demographics about the participants, ascertain the current status of collaborative practices in which the pharmacists are engaged and query as to what areas are being practiced. The survey contains questions about pharmacists’ satisfaction with the CPE activity. Descriptive statistics will be utilized to determine the results. Results: The CPE activity was offered last year and to date just over 150 pharmacists have been credentialed. Data will be presented on the demographics of the credentialed pharmacists, the number currently engaged in collaborative practice, what areas of practice have been established and their satisfaction with CPE program. Implications: Working in collaboration with other health care providers is one mechanism for expansion of pharmacy practice. Results from this project will determine how the CPE training in disease state management impacted pharmacist practice in the state.

Pharmacogenomics Education and Training Needs for Pharmacists: A Pilot Study. Kenza E. Benzeroual, Long Island University. Objectives: The present pilot study investigates practicing pharmacist’s perceptions of their pharmacogenomics (PGx) knowledge, education, training needs, and PGx usefulness in clinical practice. The study will also determine the type of educational programs needed to help PGx integration in clinical practice. Method: A cross-sectional survey was sent via postal mail to 500 pharmacists randomly selected from the database of New York State licensed pharmacists obtained from the Office of Health Professions. Descriptive and bivariate statistical analysis will be carried out using SPSS software. Results: Data obtained from this study will be informative of practicing pharmacists’ education, training needs, and usefulness in practice. Training and educational preferences, as well as barriers will also be reported. Implications: Results obtained from this study will guide the rationale for developing programs in the format of CEIs or certificate in different areas of pharmacogenomics as applied to clinical practice.

Pharmacy Education - Staying Ahead of the Present. Cyndi Porter, California Northstate College of Pharmacy, Bradley Brazill, California Northstate College of Pharmacy. Objectives: To determine if California pharmacists and pharmacy students perceive a need for change in pharmacy education to better prepare the next generation of pharmacists. Method: The California Northstate College of Pharmacy Student Leadership (CAPSLEAD) team and faculty advisors developed a non-validated 43-point anonymous questionnaire that addresses four domains of pharmacy education. The survey was developed using www.surveymonkey.com and sent out on July 28th, 2010 to three target populations consisting of fourth-year California pharmacists and pharmacy students, and practicing California pharmacists with three to seven years of experience. To maintain confidentiality, the questionnaire was distributed online to the above target groups, CPhA members, CSHP members, and the students of the eight California schools of pharmacy. Results will be collected from www.surveymonkey.com and analyzed by the CNCP CAPSLEAD team using descriptive statistics. Where indicated, hypothesis testing will rely on Chi-square and Student’s T-Test, as appropriate. Results: To be determined Implications: To be determined.

The Institution of Accessible and Meaningful School of Pharmacy-Based Faculty Development. Skye A. McKenno, University of Washington, Peggy S. Odegard, University of Washington. Objectives: Professional development is an attractive aspect of academic life and is often reported by faculty as a key reason they chose and remain in academia. Currently, many colleges of pharmacy are faced with budget cuts, which can translate into decreased funding, increased teaching loads, and less time devoted to professional development. The object of this study is to institute professional development programs that are accessible (in terms of location, time commitment, and cost),
as well as meaningful to faculty. **Method:** A group of faculty members of the University of Washington School of Pharmacy were surveyed prior to beginning regular bi-weekly clinical conferences instituted for the purpose of faculty development and collaboration. The survey assessed pharmacist faculty satisfaction in the areas of scholarly activity, orientation to the profession and professional education, and faculty development. After this, certain members of the faculty will attend bi-weekly professional development clinical conferences sponsored and held within the school. After two academic quarters of clinical conference attendance, the survey will then be re-administered and results compared. **Results:** Results and outcomes pending completion of the six month study period. Analysis will be completed by the July 2011 AACP meeting. **Implications:** School of Pharmacy-based faculty development through regular clinical conferences could be an effective, accessible, and budget-friendly way for faculty to engage in professional development.

**Validation of a Tool to Assess Student Simulation Performance in a Clostridium Difficile Scenario.** Jennifer D. Robinson, Washington State University, Brenda S. Bray, Washington State University, Megan N. Willson, Washington State University, Catrina Schwartz, Washington State University, Douglas L. Weeks, Washington State University. **Objectives:** To validate a tool used to assess pharmacy student performance in a simulation based exercise focused on a Clostridium difficile infection in an inpatient hospital setting. This study specifically focused on the content validity and inter-rater reliability of a peer-reviewed evaluation rubric. **Method:** An education module was created to expose second year student pharmacists to a contagious infectious disease patient case. The student pharmacists were required to use patient assessment techniques to determine the severity of the infection and evaluate current treatment while following infection control precautions and isolation procedures. A content validity process that depended on experts in infectious disease, simulation evaluation, and instrument development was followed to assure critical content was represented on the tool. The final tool was used to evaluate the performance of each student group. Each simulation session was video recorded. Four raters independently assessed student performance; scores from these four raters were used to establish inter-rater reliability of the tool. **Results:** The content validity process resulted in a tool with 6 categories that evaluated content in both the cognitive and psychomotor domains. Implications of inter-rater reliability analyses will be discussed in terms of items essential to maintain overall item reliability. **Implications:** The measurement of student performance and learning while utilizing human patient simulation using a validated evidence based rubric is currently limited. We hope this project result in a tool that can be used for infectious disease human patient simulation scenarios, and that it is adaptable to other patient care scenarios.

**EXPERIENTIAL EDUCATION**

**Completed Research**

**A Scavenger Hunt Assignment to Enhance Learning During an Introductory Pharmacy Practice Experience.** Susan Jacob, Western University of Health Sciences, Patrick Chan, Western University of Health Sciences, Doreen Pon, Western University of Health Sciences. **Objectives:** To enhance student pharmacist learning during an introductory pharmacy practice experience (IPPE) through the use of a “scavenger hunt” assignment **Method:** A “scavenger hunt” assignment (SHA), consisting of a series of open-ended questions related to institutional pharmacy practice, was developed to encourage students to fully participate in their one-month long IPPE rotational experience by actively exploring their rotation sites and interacting with pharmacy personnel. Although the SHA was not graded, before the completion of the rotation students had to successfully pass a quiz based on concepts from the SHA. At the completion of the course, students completed a survey regarding the SHA. **Results:** Of a total of 130 students enrolled in the course, 63% indicated that >50% of the material on the SHA was previously unfamiliar to them and 63% agreed or strongly agreed that the SHA helped enhance their learning. 67% of students discussed questions from the SHA with their preceptors at least once weekly and >70% of students reported using their site’s policies and procedures, the Joint Commission website, internet searches and their preceptors to help them complete the SHA. **Implications:** A SHA designed to enhance students’ understanding of institutional pharmacy practice during an IPPE rotation was well-received by the majority of students and appeared to help stimulate student interactions with their site-specific resources.

**A Survey Measuring Science of Safety Topic Coverage in Experiential Education: US and Taiwan Pharmacy Schools.** Derek Tang, The University of Arizona, Terri L. Warholak, The University of Arizona, Marion K. Slack, The University of Arizona, Daniel C. Malone, The University of Arizona. **Objectives:** This study aimed to compare the Science of Safety (SoS) topic coverage and associated student competencies in the experiential education curricula of accredited pharmacy schools in the US and Taiwan. **Method:** An internet-based survey was conducted. A simple random sample of 34 out of 107 US pharmacy schools was obtained and all seven Taiwan pharmacy schools were included in this study. One key informant from each school who held a position of experiential education director, assistant director, or coordinator was invited to participate in the survey. **Results:** Eighty-two percent and 100% of the sample responded in the US and Taiwan respectively. Respondents generally thought that the SoS related to medication safety. Taiwanese key informants were more likely to use the US Food and Drug Administration’s drug development timeline approach when they defined the SoS (p = 0.03) than were their US counterparts. No significant differences in the coverage of SoS topics in college experiential education curricula was perceived by US and Taiwan respondents. However, US faculty members perceived that their students had significantly higher SoS skill levels in approximately two thirds of the listed SoS competencies before and after Advanced Pharmacy Practice Experiences (APPE). **Implications:** Pharmacy experiential experts in both countries can appraise whether the differences are indeed gaps that need to be addressed in the curriculum. Pharmacy school faculty can examine study results to assess if their school deviates greatly from the national results, and consider if these deviations are gaps that should be filled.

**A Systematic Quality Improvement Course Review of Advanced Pharmacy Practice Experiences.** Lynn Stevenson, Auburn University, Lori Hornsby, Auburn University, Haley Phillippe, Auburn University, Kristi W. Kelley, Auburn University, April Staton, Auburn University, Sharon McDonough, Auburn University. **Objectives:** To determine quality improvements for advanced pharmacy practice experiences (APPE) through a systematic course review process. **Method:** A systematic course review was conducted by the curricular subcommittee responsible for experiential education following the “developing a curriculum” (DACUM) format. Course materials and assessments were reviewed including orientation information, rotation syllabi, student resources, evaluation tools, grade distributions, and preceptor evaluations. An anonymous survey developed from recommendations provided in the American College of Clinical Pharmacy White Paper and Position Statement on experiential education was
administered electronically to fourth-year students in their final month of rotations. Course sequence overview and data were presented and discussed with stakeholders during two 4-hour sessions. A standardized course review worksheet was completed, outlining strengths and areas for improvement. Results: Preceptor and site evaluations indicated an overall teaching ability of exceptional or very good for 81% of rotations. Student survey responses were positive concerning exposure to multiple patient populations and disease states, orientation to scope of practice, adequate supervision, treatment as junior colleagues, and level of self-directed learning. Areas for improvement included preceptor and site development, standardization of course syllabi, preceptor understanding of evaluation tool, ensuring effective feedback to students, establishment of minimum requirements for certain rotations, utilizing student self-assessments, and re-evaluation of drug information as a required APPE. Implications: Course reviews are a necessary but often difficult process in curricular quality improvement. Reviewing the APPE course sequence brought additional challenges. Through a systematic process, strengths and weaknesses were identified and will be part of continuous quality improvement.

A Two-Campus Model for Providing an Influenza Immunization Introductory Pharmacy Practice Experience (IPPE). Lindsay H. Welch, The University of Georgia, Dianne Williams, The University of Georgia, Deanna W. McEwen, The University of Georgia, Lori J. Duke, The University of Georgia, Whitney L. Unterwagner, The University of Georgia, Ginger T. Lancaster, The University of Georgia.

Objectives: To develop and institute a two-campus model for an influenza immunization IPPE for third year pharmacy students.

Method: During the fall of 2010, the University of Georgia College of Pharmacy (UGACOP) implemented an influenza immunization IPPE component for third year pharmacy students. This IPPE consisted of successful completion of the APhA Pharmacy-Based Immunization Delivery course, a simulation to reinforce skills and review the immunization process, and practical experience during immunization clinics. A range of locations were used for the immunization administration portion. On the Athens campus, locations included various sites on college campuses, day care facilities, government buildings, and a local private school. On the satellite campus in Augusta, partnerships were formed with the MCG Health Medical Center Occupational Health department and area retail pharmacies. All immunizations were given under physician protocol agreements as required by Georgia law. Results: One-hundred twenty-five students administered approximately 2,700 influenza vaccinations from September to November 2010. Students received a total of 18 IPPE hours for completion of the APPE. One-hundred twenty-two students completed both the pre / post tests and were included in the study. The mean score of the pre-test was 15.03 ± 3.06 (P < 0.05) and the post test was 18.39 ± 3.04 (P < 0.005) resulting in a 22% increase in the students’ score. Overall, 81.5% of the students who participated in the poison prevention program improved their score following the presentation. Implications: As more elementary students are exposed to poison prevention programs, their knowledge regarding possible dangers increases as well as their acuity to their environment. Therefore, as the number of schools/classrooms we reach via our program increases, there is the potential to have a significant decrease in poisoning incidents within our community.

At the Massachusetts Institute of Technology (MIT), David Jacobs, the University of Georgia, Whitney L. Unterwagner, The University of Georgia, Ginger T. Lancaster, The University of Georgia.

Objectives: To characterize University of Minnesota Academic Health Center students’ attitudes towards working with the underserved as well as attitudes towards working interprofessionally at a student-run clinic for the underserved. Method: Pharmacy, medicine, nursing, physical therapy, public health, and social work students at the University of Minnesota collaborate to provide free care to underserved patients at the Phillips Neighborhood Clinic (PNC). Applicants to the PNC, as well as first year students from all programs, were surveyed using a 5 point Likert scale and the HPATHI (Health Professionals’ Attitudes Towards the Homeless Inventory) and University of West England interprofessional questionnaires. Results: 270 students (158 applicants, 112 non-applicants) completed initial surveys in fall of 2009. Baseline results showed students who applied to PNC had significantly more positive attitudes towards working with the underserved (4.30 vs 3.98, p < 0.0001) and working with students from other health professions (137.2 vs 128.3, p < 0.0001) compared to students who did not apply to the PNC. Social work students had a higher interest in working with the underserved (4.41) compared to students in medicine (4.13, p = 0.0362) and physical therapy (4.10, p = 0.0453). Pharmacy students showed more interest in interprofessional work (140.19) than medical students (131.27, p = 0.0049) and public health (132.46, p = 0.00945). Implications: Colleges and Schools of Pharmacy strive to develop practitioners who can provide team-based care and care to the underserved. Understanding baseline attitudes is important to targeting educational opportunities as well as in assessing growth.

Evaluating the Success of a School of Pharmacy’s Experiential Program Using Preceptor Survey Data. Kathy Zaiken, Massachusetts College of Pharmacy and Health Sciences-Boston, Paul DiFrancesco, Massachusetts College of Pharmacy and Health Sciences-Boston, Timothy Hudd, Massachusetts College of Pharmacy and Health Sciences-Boston, Claire DiFrancesco, Massachusetts College of Pharmacy and Health Sciences-Worcester. Objectives: The objectives of this survey were to obtain preceptor feedback concerning the Massachusetts College of Pharmacy and Health Sciences grading tool and student performance during Advanced Practice Experience Rotations, and for use as an internal tool for assessment and evaluation of the experiential program. Method: The experiential education department developed and distributed a survey to more than 250 preceptors for...
sixth year pharmacy students. The purpose was twofold; to determine how preceptors interact and evaluate our students, and to get feedback about the success of our students in terms of drug knowledge, skills, and professionalism. **Results:** Key survey results revealed the following concerning preceptors: *85% practiced in a multicultural environment; *98% were either satisfied or very satisfied with how students generally approached patient care; *95% were either satisfied or very satisfied with how students demonstrated their professionalism; *97% were either satisfied or very satisfied with how students showed an ability to progress in their learning during a six week rotation. **Implications:** Analysis of the survey results provide more accurate profiles of preceptors which will help improve student placement. Examination of the data about how preceptors communicate, interact, and evaluate students will enable us to develop more effective preceptor development programs. Lastly, preceptor feedback concerning the success of our students in the three key learning areas; 1) drug knowledge (cognitive), 2) skills (psychomotor), and 3) professionalism (affective) was beneficial and resulted in improvement in the quality of education provided by faculty via curriculum changes.

GRACE (Growing Respect and Care for the Elderly) Program: an Introductory Pharmacy Practice Experience (IPPE). Cynthia Villareal, University of the Incarnate Word, Jeffrey T. Copeland, University of the Incarnate Word, David F. Maize, University of the Incarnate Word. **Objectives:** The GRACE IPPE Program sent pairs of P3 students to visit nursing home residents over a six week period. Students met residents once weekly to discuss medications. Following their meeting, the students evaluated their resident’s chart followed by a discussion with a consultant pharmacist. At the midpoint, students completed both a subjective and objective evaluation of the resident, and at the completion of the program, they presented their SOAP note to classmates and instructors. Given that this was the first implementation of the GRACE IPPE Program, the main objective of this study was to evaluate student perceptions of the growth in their clinical skills. **Method:** P3 students (n = 83) completed an anonymous 10-question online survey. The response rate was 93%. Statistics were calculated by SPSS. **Results:** The students were asked to rate their abilities in resident interaction, performing DUR, pharmacist interaction, using a resident monitoring form, reviewing residents’ charts, preparing and presenting a SOAP note before and after the program. Statistically, they believed their skills improved (p < .0001) in all areas following their experience. Initially, students reported their skills were average (2.96, average = 3). Upon completion, students reported that their skills had significantly improved by 20% (3.74, above average = 4) to nearly above average (p < .0001).

**Implications:** The implementation of the GRACE IPPE Program: 1) provided clinical experience in a geriatric population for the first time, 2) students reported that their skills learned in the classroom were clearly enhanced by their IPPE field experience.

Identification of Drug-Related Problems by APPE Students in the Home Healthcare Setting. Timothy D. Aungst, Wilkes University, Christina Yesu, Wilkes University, Kristen Billek, Wilkes University, Edward F. Foote, Wilkes University. **Objectives:** Wilkes University has offered a unique elective APPE at the local Visiting Nurses Association (VNA) since January 2008. The objective of this research was to determine the number of drug-related problems (DRPs) identified by students and the proportion of recommendations accepted by prescribers. **Method:** Students, under the direction of a preceptor, intervened in patient care either by home visits or through in-center chart reviews. For each patient encounter, DRPs identified by students were documented on a DRP form. We retrospectively reviewed these forms. Data collected included type of DRP, setting (home vs. in-center chart review) and outcome (acceptance or rejection of recommendations). This project was approved by our IRB. **Results:** From January 2008 to July 2010, 12 students completed this APPE. We identified 465 DRP forms containing 608 recommendations. Twenty percent of the DRP forms were generated during home visits and the remaining were from in-center chart reviews. The three most common recommendations were related to missing therapy (15%), drug interaction (13%), excessive acetaminophen (10%) and inappropriate dose (10%). The overall acceptance rate of recommendations was 37%. Recommendations generated during home visits were more likely to be accepted than those generated through chart reviews, 70% vs. 27%, respectively (p < .01). **Implications:** Pharmacy student involvement in the home care setting is innovative. Our data suggest APPE students can successfully identify and recommend improvements for multiple DRPs in the home healthcare setting. Home visits may be more effective than chart reviews for gaining acceptance of recommendations. Further research is needed on the clinical outcomes of these interventions.

Impact of Clinical and Faculty-Led Advanced Pharmacy Practice Experiences on Student Capstone Scores. Ragini Bhakta, Roseman University of Health Sciences, Meghan Jeffreys, Roseman University of Health Sciences, Kaushik Vedam, Roseman University of Health Sciences. **Objectives:** This project sought to determine if there is a correlation between number of clinical or faculty-led advanced pharmacy practice experiences (APPE) and student final summative exam (capstone) scores at the Roseman University of Health Sciences (formerly University of Southern Nevada (USN)). **Method:** All students in the graduating class of 2010 successfully completing 7 APPE and capstone exam were included. APPE data was coded for rotation type (clinical vs. non-clinical) and preceptor affiliation (faculty, adjunct faculty, or non-USN). **Results:** The analysis included 122 students. Capstone scores are numerically higher for students with at least one faculty-led rotation, 78.3% (n = 61) vs. 75.8% (n = 61), p = 0.167. Students with at least one faculty or adjunct-faculty led rotation have numerically higher capstone scores, 78.4% (n = 70) vs. 75.2% (n = 52), p = 0.064. Capstone scores are higher for students with at least 3 clinical rotations, 77.9% (n = 100) vs. 73.3% (n = 22), p = 0.046. Student capstone scores increase with the number of clinical rotations; 2 (n = 22): 73.4%; 3 (n = 50): 77.3%; 4 (n = 31): 77.5%; 5 (n = 17): 79.6%; 6 (n = 2): 84.0%. **Implications:** Students completing at least three clinical APPEs have statistically higher capstone scores. Capstone scores continue to increase in relation to the number of clinical rotations completed. Trends to higher capstone scores were noted for students completing faculty-led APPE. The evidence supports the need to focus APPE efforts on offering more clinical and faculty-led rotations. Increasing the number of clinical and faculty-led rotations can only be done by increasing the number of clinical faculty.

Impact of a College-wide Influenza Prevention Campaign Including Three-tiers of Pharmacy Practice Experiences. Susan E. Conway, The University of Oklahoma, Tracy M. Hagemann, The University of Oklahoma. **Objectives:** A college-wide influenza prevention campaign was designed to enhance our core immunization curriculum. **Method:** The college’s faculty, staff, and students were invited to 2 educational seminars focusing on influenza prevention strategies and the pharmacists’ role in vaccinations. Influenza clinics were held across campus offering free vaccinations. Students interested in participating in the influenza clinics volunteered through the Pharmacy Practice Experiences (PPE) program. Second year students (P2s) were assigned to a 4-hour Introductory PPE (IPPE) aiding in registering and screening patients.
patients. Third year students (P3s) enrolled in a 20-hour, longitudinal IPPE which required attendance at the educational seminars, participation in pre- and post-influenza clinic sessions, provision of vaccinations for 13 hours of influenza clinics, and a written reflective essay. Fourth year students (P4s) on advanced PPE (APPE) provided vaccinations at influenza clinics upon coordination with their individual preceptors. Results: Approximately 100 faculty, staff, and students attended each of the educational seminars. A post-campaign assessment showed an increase in influenza vaccination among our college population to 77% for 2010-2011 compared to 55% in 2008-2009 and 65% in 2009-2010. The campus-wide influenza clinics provided 55 hours of IPPE for 11 P2s, 260 hours of IPPE for 20 P3s, and 130 hours towards APPEs for 12 P4s. The student volunteers reported an overwhelming positive experience from participating in the influenza clinics and the P3 students in the longitudinal IPPE showed improvements in knowledge tests and self-rated abilities. Implications: This college-wide campaign positively influenced our college population to get educated, get vaccinated, and become facilitators of influenza prevention.

Impact of a Service Learning Experience during a Cardiology Rotation. Kathleen A. Packard, Creighton University, Ann M. Ryan-Haddad, Creighton University. Objectives: The impact of a one-time service learning experience on students’ confidence and beliefs was assessed. Method: Between 2008 and 2010, 62 fourth-year pharmacy students on a cardiology rotation completed service learning at a free urgent care clinic for uninsured and under-insured patients. Activities included working with providers to create cost-effective care plans based on a formulary, provision of medications, and patient counseling. Students completed a ten-item pre- and post-experience survey to assess changes in confidence, knowledge, and beliefs. Answers were recorded on a five-point Likert scale (1 - strongly disagree to 5 - strongly agree). Results: There were small but statistically significant improvements in students’ confidence in clinical skills to evaluate drug regimens (0.17, p = 0.004), confidence in clinical skills to resolve medication-related problems (0.27, p < 0.001), confidence in formulating care plans (0.32, p < 0.001), confidence in collaboration with healthcare providers and patients (0.26, p < 0.001), confidence to resolve barriers to medication adherence (0.37, p < 0.001), and understanding of community needs and problems (0.26, p = 0.01). There were no significant changes in confidence to counsel patients or demonstrate sensitivity to patients. Likewise, there were no changes in the students’ beliefs that community service should be voluntary versus required and that content is best learned when connected to real life situations. Implications: Incorporation of a one-time service learning activity is best learned when connected to real life situations.

Implementing Honors-Pass-Fail Grading for Advanced Pharmacy Practice Experiences. Jay D. Currie, The University of Iowa, Susan S. Vos, The University of Iowa, Sandra J. Johnson, The University of Iowa, Lisa DuBrava, The University of Iowa. Objectives: Consistent evaluation and grade assignment across Advanced Pharmacy Practice Experiences (APPEs) is difficult due to variability of graders and rotation sites. A standardized clinical rotation evaluation was partially successful, but incomplete in covering all APPE outcomes. Newly defined curricular outcomes, a desire to address perceived grade inflation on APPEs, and preceptor frustration with letter grade assignment provided the opportunity to implement a comprehensive new APPE evaluation system and transition from letter grades to Honors-Pass-Fail (HPF) for APPEs. Method: An ad hoc committee was charged with developing a new system of HPF grading, including the evaluation form and tools necessary to implement the conversion. The 2004 CAPE Educational Outcomes and Supplements were used to synthesize an evaluation tool for College APPE outcomes. It included items pertaining to Patient Care, Communication, Population Care, Practice Management, and Professionalism and was designed to measure student performance not grade attainment. Scoring system anchors and customization options for additional rotation requirements were developed. Thresholds for passing (competent) and for honors (extraordinary) performance were established. Training materials and educational sessions on the new system were provided to preceptors. Results: In the year prior to HPF implementation, 87% of APPE rotation grades were ’A’, with 5.5% receiving an ’A+'. After implementation, the percentage of APPE rotations receiving an honors designation was 22.4% and 19.25% in the first two years respectively. Implications: A revised evaluation system allowed several issues commonly seen with APPE student assessment to be addressed. Designation of outstanding student performance was possible using an Honors-Pass-Fail system.

Providing Sustainable Immunization Introductory Pharmacy Practice Experiences (IPPEs) through Entrepreneurship and Community Partners. Lindsey H. Welch, The University of Georgia, Deanna W. McEwen, The University of Georgia, Lori J. Duke, The University of Georgia, Whitney L. Unterwagner, The University of Georgia, Charles H. McDuffie, The University of Georgia. Objectives: To provide a physically and financially sustainable IPPE in influenza vaccine administration for third year pharmacy students. Method: In Fall 2010, an influenza immunization IPPE was implemented for third year pharmacy students to meet accreditation requirements. Students were required to attain 12 hours of immunization experience by participating in several student-run clinics which were overseen by faculty members. The Division of Experience Programs
established 25 immunization clinics at various community sites to provide IPPE hours for 100 students. Influenza vaccine and supplies were purchased through the College. A contract was secured with Athens-Clarke County Unified Government to provide vaccinations to government employees and their dependents. Ten of the 25 clinics were held at local government facilities to service this population. Other clinic patients were charged at the time of service. Results: Barriers to providing this type of entrepreneurial service include concerns with anticipating vaccine supply and demand, inability to file immunizations under insurance, and a significant amount of faculty involvement to ensure clinics are adequately supervised. Experience Program faculty plan to continue the relationship with Athens-Clarke County Unified Government while pursuing additional partnerships. A recently secured Medicare Part B contract will expand marketing efforts to senior citizen groups. Implications: Sustainability of IPPEs is a common concern for colleges of pharmacy due to growing competition for IPPE sites. By forming community partnerships and using entrepreneurial models, colleges of pharmacy can better preserve and maintain IPPE programs.

Student Pharmacists’ Opinions on Providing Continuing Education (CE) to Pharmacists. Schwanda K. Flowers, University of Arkansas for Medical Sciences, Christine Browning, University of Arkansas for Medical Sciences, Mallory Maulden, University of Arkansas for Medical Sciences. Objectives: Arkansas pharmacists are required to complete 30 hours of CE per biennium, 12 must be live. Students on Advanced Pharmacy Practice Experiences (APPEs) are a resource for pharmacists by providing live CE. Students develop presentation, leadership and organizational skills, and gain knowledge of CE and documentation requirements. The purpose of this study is to determine the number of APPE students providing CE and assess their opinions of the benefits to student learning. Method: One hundred and fifteen APPE students were emailed a link to a survey site (Survey Monkey). The 9 question survey was open from mid-December to early January. All P4 students were eligible to participate; students were provided a request for voluntary participation, rationale for the study and risks and benefits of participation. No personal identifying information was collected. Data was analyzed using descriptive statistics. Results: Forty-four students completed the survey. 24 provided one CE and 13 provided two or more. CE was provided in multiple settings, 79.5% (institutional), 29.5% (community), and 6.8% (electives). 40.9% of respondents reported being comfortable providing CE. 52.3% indicated the programs were valuable to pharmacists. However, 38.6% felt providing CE was valuable to their education. Implications: Providing CE is a common component of APPEs and provides opportunities for Arkansas pharmacists to fulfill CE requirements for the state board. Student pharmacists are providing CE in a variety of practice sites, institutional settings being the most common. While students feel providing CE is valuable for pharmacists, they do not feel it is as beneficial to their education.

Successful Integration of Health Literacy into an Introductory Pharmacy Practice Experience Course. Gloria Grice, St. Louis College of Pharmacy, Amy M. Tiemeier, St. Louis College of Pharmacy, Tracy M. Berry, St. Louis College of Pharmacy, Theresa R. Prosser, St. Louis College of Pharmacy, Jill Sailors, St. Louis College of Pharmacy, Nicole Gattas, St. Louis College of Pharmacy, Peter D. Hurd, St. Louis College of Pharmacy, Julie A. Murphy, St. Louis College of Pharmacy, Rebecca Reeda, St. Louis College of Pharmacy, Wendy Duncan, St. Louis College of Pharmacy. Objectives: To evaluate a new required Introductory Pharmacy Practice Experience (IPPE) course for 3rd professional year students. Students had the opportunity to develop a longitudinal relationship with a geriatric patient, providing direct patient care while developing health literacy (HL) skills. Method: Volunteers were recruited from thirteen independent senior living facilities across St. Louis. Over 2 semesters, students (in pairs) made six 1-hour visits to their individually assigned resident. Guidance was provided on tasks for each visit such as practicing the 4-Habits Model, assessing health literacy using the Newest Vital Sign, reviewing the resident’s medications, completing a household safety check, assessing barriers to healthcare access, and reviewing pharmacist-approved recommendations with their resident. Students also obtained vital signs, and performed depression/dementia screening and relevant physical assessment. Students reflected on the experience and asked residents to complete a satisfaction survey. The survey included 8 questions [Likert scale: strongly agree (1) to strongly disagree (5)] and solicited additional comments. Results: Of 185 residents, 164 [89%] completed the survey. Results indicated that students were well mannered (mean = 1.2), showed genuine concern for resident problems (mean = 1.3), made an effort to make resident comfortable (mean = 1.3), made sure resident clearly understood the information provided (mean = 1.3), and had clear goals for the visit (mean = 1.4). Additionally, residents reported that because of the program, they felt more confident in asking health professionals questions about their health (mean = 1.3). Analysis of qualitative data from student reflections also revealed positive outcomes. Implications: Students and participants benefit from incorporation of HL skills into an IPPE course.

The Current State of Preceptor Development: Results of a Survey by Preceptor Development Task Force. Denise A. Solitis, Drake University, Maryann Z. Skrabal, Creighton University, Nora L. Stelter, Drake University, Robert L. Talbert, The University of Texas at Austin, Meri Hix, Midwestern University’s Chicago College of Pharmacy, Michelle Katsiyannis, St. Louis College of Pharmacy, Mariana Lapidus, Massachusetts College of Pharmacy and Health Sciences-Boston, Irena Bond, Massachusetts College of Pharmacy and Health Sciences-Worcester, Christina M. Seeger, University of the Incarnate Word, Patricia A. Marken, University of Missouri-Kansas City. Objectives: The COS Preceptor Development Task Force was charged to compose recommendations with regard to preceptor development that could be standardized across institutions, explore the possibility of AACP providing programming, and make suggestions concerning a national preceptor-training program. To meet these charges, a survey was designed to research and assess the current state of preceptor development. Method: A 40-item survey was developed using Qualtrics and administered to Experiential Administrators representing all schools and colleges of pharmacy in the winter of 2010. Results: Ninety-four of 128 Experiential Administrators responded. Ninety-seven percent currently offer preceptor development. About one-half require preceptors to complete development, although several expressed difficulty enforcing it. When asked whether development should be required: 58% responded yes, 18% no. Preceptor participation varied from 10%-100%. When asked if they would support a national program: 45% responded yes, 20% no, 35% unsure. When asked if they would support AACP development of programming: 75% responded yes, 8% no, 17% unsure. Eighty percent of programs do not currently pay for development. When asked about willingness to pay for development: 21% responded yes, 27% no, 52% unsure (cost-dependent; public schools lack resources). Ninety-eight percent stated that continuing education should be provided with training. Implications: The Task Force recommends further study on cost, feasibility, and potential delivery mechanism(s) of an AACP-developed program. The Task Force
The Social Network: How Do Students Communicate Online During an Experiential Rotation? Doreen Pon, Western University of Health Sciences, Patrick Chan, Western University of Health Sciences. Objectives: To evaluate the use of an online discussion board (DB) to facilitate weekly “reflections” during an introductory pharmacy practice experience (IPPE) rotation. Method: 130 students were enrolled in 3 consecutive, 1-month IPPE rotations. Students were required to make 2 weekly posts to a DB during their rotation. Weekly DB topics were the same for all 3 groups. Upon completion of the course, students completed a survey regarding use of the DB. The number of times the students accessed the DB, number of posts, and the date on which posts were posted were captured by the DB program. Non-mandatory post context was analyzed and classified as “sharing”, “replying”, “asking” or “answering”. Non-mandatory post content was classified as “professional”, “social” or “technical”. Results: Students posted a median of 9 posts and accessed the DB a median of 52 times during their 4 week rotation. 58% of posts were posted on Thursday and Friday of each week. The majority of non-mandatory posts were in reply to other students’ posts, while only 7.6% of posts were to ask questions. The content of the non-mandatory posts was primarily “professional” (54.1%). 74% of students preferred online rather than in-class reflections. Implications: An online DB may have advantages over face-to-face discussions and reflective journaling. In an IPPE DB, all students shared reflections and voluntarily accessed the DB to read other posts. Earlier posting deadlines and mandatory commenting on other posts may help facilitate “discussion” within the DB.

The Evaluation of Clinical Knowledge before and after and Ambulatory Care Advanced Pharmacy Practice Experience. Jean Y. Moon, University of Minnesota, Chrystian R. Pereira, University of Minnesota, Jody L. Lounsbury, University of Minnesota. Objectives: To develop an assessment process of clinical knowledge for two ambulatory care APPEs and to evaluate student performance before and after an ambulatory care APPE. Method: A 20 question case-based quiz on conditions and drugs common to family medicine patient care was developed and used at two ambulatory patient care sites for advanced pharmacy practice. Students completed the quiz on the first day of the APPE and were able to use select general drug information references. Preceptors used the questions answered incorrectly to guide topic discussions over the five week rotation. On the final day of the APPE, students were reassessed using the same questions. For data analysis, students were categorized as early, mid- or late rotation depending on the month that they started their rotation. Results: A total of 48 students from July 2006 to December 2010 completed both pre and post tests. Average pre-test score was 12.6 out of 20 (63%) and average post-test score was 16.7 out of 20 (83.5%). Students improved on average 4.1 points. For the pre-test, students had most difficulty with diabetes, anticoagulation, depression, asthma and hypertension management. Post-test students struggled with asthma, cholesterol and anticoagulation management. Scores for average pre-test/post-test/change in score were as follows: early rotation 12.1/16.1/4.0; mid-rotation 12.6/17.2/4.5; late rotation 13.5/17.2/3.7. Implications: Regardless of the when the student had this patient care rotation (early, mid- or late), students improved their overall score. Students continued to have the most difficulty with asthma and anticoagulation management questions.
Utilization of IPPE III Student Interventions by Medical Teams at a Long Term Care Facility. Sherry A. Jimenez, St. John Fisher College, John Veneron, Monroe Community Hospital, Asim M. Abu-Baker, St. John Fisher College, Robert DiCenzo, Albany College of Pharmacy and Health Sciences, Keith DeMonte, St. John Fisher College. Objectives: The Wegmans School of Pharmacy at St John Fisher College requires an IPPE III rotation in long term care (LTC) during fall semester of the third professional year. The purpose of this study is to investigate the number of student interventions utilized by medical teams for residents at the rotation site and the resultant cost avoidance over a two year period. Method: Students conducted five 2-hour visits with one patient at a LTC facility to complete required assignments including initiating one pharmacy intervention. Interventions were reviewed by the pharmacy team at the site and acceptable interventions were forwarded to the medical team for potential utilization. Results: Thirty-one interventions were accepted and forwarded to the medical team in 2009. Twenty-seven interventions were accepted and forwarded to the medical team in 2010. Fifty-five and 63% of accepted interventions were utilized by the medical team for residents in 2009 and 2010, respectively. Monthly cost avoidance experienced as a result of interventions utilized was $194.69 in 2009 and $78.41 in 2010. Seventy-one percent of utilized interventions resulted in a change in therapy for residents in 2009 and 2010. Implications: This study demonstrates that students have a significant impact on clinical interventions in a long term care facility during introductory rotations. Interventions resulted in changes in patient therapy and cost avoidance. Plans for improvement include increased intervention assignments and targeted education during the didactic class.

Utilizing the Personal S(O)AP Note as a Reflective Tool for Introductory Pharmacy Practice Experience Students. Kristopher Harrell, The University of Mississippi, Whitney R. Royse, The University of Mississippi Medical Center, Alicia S. Bouladin, The University of Mississippi. Objectives: The purpose of this project was to evaluate student self-perception of pharmacy school progression using a Personal S(O)AP reflective tool. Method: Students in the second (PY2) and third (PY3) professional years completed Personal S(O)AP Note exercises during classroom experiential reflection periods. The collected subjective questions (S) asked how courses and rotations prepared students to become pharmacists. Students also self-rated objective data ((O)), grade point average (GPA) and standardized test results (PCOA), as well as drug knowledge, patient care and communication skills, professionalism, and self-confidence. Based on those reflections students developed formal assessments (A) and specific plans (P) to build upon identified strengths and improve perceived weaknesses. Responses were analyzed to identify student-perceived favorable areas and those areas that could be improved. Results: 96 of 104 PY3 students and 90 of 94 PY2 students completed the tool. Pertaining to GPA, 76% of the PY3 class and 85% of the PY2 class rated performance as superlative or good. For the PCOA, 55% of both classes responded their results were disappointing or needed improvement. For drug knowledge 65% of PY3 students responded superlative or good, in contrast to 27% of PY2 students. Patient care skills, communication skills, and professionalism were rated superlative or good in more than 75% of both classes. However, self-confidence was reported as disappointing or needed improvement by 42% of PY3 students and 49% of PY2 students. Implications: These data suggest student perceptions of progression are mostly positive, but the areas of drug knowledge and self-confidence could potentially be targeted for enhancement.

Value of a Local Introductory Pharmacy Practice Experience Coordinator at a Branch College of Pharmacy. Andrew Draper, Roseman University of Health Sciences. Objectives: To demonstrate the effect of a local IPPE site coordinator on perceptions of preceptor support and program awareness. Literature does not specifically document how a locally-based experiential coordinator affects preceptor perceptions of COP support; over 25 COP programs offer instruction at remote campuses, and must therefore consider whether to employ a local experiential coordinator. Before 2009, IPPE activities for the USN Utah campus were coordinated remotely from the main campus in Nevada. Method: During November-December 2010, survey forms were e-mailed out to 136 IPPE preceptors in the Utah area; 53 were returned. Data were analyzed to assess the impact of a local experiential coordinator. Results: The majority of preceptors (43.4%) had pre-accepted for USN for ≥5 years; an even greater number (62.3%) had pre-accepted for USN prior to the arrival of the local IPPE coordinator in June 2009. Over two-thirds of the respondents (67.9%) were employed by chain pharmacies, and the remaining respondents were employed by grocery stores. Overall, the majority of the pharmacists (53.9%) surveyed felt that the IPPE program support had improved since the arrival of the local coordinator; no respondents felt that the support of the program had lessened. The low response rate (39.0%) was attributed to another recently-sent survey, timing of the survey, and e-mail address changes for preceptors of one grocery chain. Implications: COP programs with remote campuses are becoming more common. Administrators should consider how preceptors’ perceived benefits of a local experiential coordinator can foster adequate numbers of qualified sites for their programs.

Yipee IPPE! What I Did During My Summer Vacation. Patrick Chan, Western University of Health Sciences, Susan Jacob, Western University of Health Sciences, Doreen Pon, Western University of Health Sciences. Objectives: To evaluate student pharmacist satisfaction with an introductory pharmacy practice experience rotation (IPPE) and identify institutional pharmacy functions (IPFs) students were exposed to during IPPE. Method: After completion of the second year of pharmacy school, 130 students participated in one-month long IPPEs at over 30 different institutional practice sites (82% at teaching or non-teaching acute care hospitals). 76% of students had no previous experience working in institutional pharmacy settings. Students were requested to complete an anonymous survey regarding impressions of their rotational experience and exposure to 20 common IPFs before and during their IPPE. Results: Percent of students agreeing/strongly agreeing: site receptive to students (89%), received adequate guidance during rotation (82%), exposed to variety of job functions (79%), experience contributed to learning (90%). Percent of students (n=86) exposed to: filling medication cassettes (87%), medication review (67%), patient care rounds (64%), dosing protocols (53%), medication audits/usage evaluations (41%). Students were surveyed about 20 IPFs, which were classified as primarily “distributive” (7), “clinical” (8) or “administrative” (5) functions. Students reported being exposed to significantly more IPFs during their IPPE than prior to their IPPE (mean 10.1 vs. 5.2, p<0.0001). Median number of exposures to distributive (4.2 vs. 2.8), clinical (3.9 vs. 1.7) and administrative (1.9 vs. 0.7) functions were all significantly greater during IPPE than prior. Implications: Student satisfaction with IPPE was high. Students were exposed to almost twice the number of IPFs during IPPE than they had been before. Student surveys can be used to help monitor the quality of IPPE.
Theoretical Models

Population Health Pinnacle: Development and Implementation of a Required Public Health Advanced Pharmacy Practice Experience. Hoai-An Truong, University of Maryland, Lynette R. Bradley-Baker, American Association of Colleges of Pharmacy, Cynthia J. Boyle, University of Maryland, Justin Constantino, University of Maryland, Sheryl Thedford, University of Maryland. Objectives: To develop course outcomes and activities for a required public health advanced pharmacy practice experience and to implement a population-based experiential rotation that prepares students to become public health pharmacists. Method: The importance for pharmacists to receive public health training and provide population-based interventions has been emphasized through educational and professional initiatives from within and beyond the profession. The University of Maryland School of Pharmacy developed public health experiential course outcomes derived from Center for Advancement of Pharmaceutical Education outcomes, accreditation standards, North American Pharmacist Licensure Examination blueprint, Association of Schools of Public Health core competencies, and Public Health in America statement. Course activities were adapted from the Clinical Prevention and Population Health Curriculum Framework. Preceptor and site qualifications included those with experiences, credentials, or specific populations related to health promotion and disease prevention, health education, health policy and advocacy, and substance abuse. Results: Course outcomes and activities stemmed from aforementioned public health competency statements reflecting 5 core areas, 3 functions, and 10 essential services of public health. Course syllabus was approved by the school’s curriculum committee. Over 50 preceptors and 30 sites were identified from Maryland’s 24 local public health departments and 10 other population-based settings such as non-profit organizations and private health agencies. Implications: It is anticipated that this experiential course builds on the knowledge, skills, and abilities regarding public health systems and provides opportunities for students to work on projects addressing issues from population-based perspectives. Pilot experiential opportunities are underway with full implementation expected for the following class.

Redesign of Applied and Experiential Education Departments through Joint Leadership and Shared Faculty. Christene M. Jolowsky, University of Minnesota, Nichole M. Kulinski, University of Minnesota, Angela K. George, University of Minnesota, Jeannine M. Conway, University of Minnesota, Charles T. Taylor, University of Minnesota, Raquel Rodriguez, University of Minnesota, Karen M.S. Bastianelli, University of Minnesota, Dawn Carlson, University of Minnesota. Objectives: To improve student assessment, skill progression and overall efficiencies by combining the leadership of the practice laboratories and experiential education divisions. Method: The College of Pharmacy conducted an extensive analysis around the curriculum, including practice laboratory and experiential components. Part of the analysis included using outside consultants and applying recommendations from a recent ACPE accreditation review. The impact will be assessed through a survey of the changes within the departments and the curriculum. Results: Based on the analysis, the College restructured the applied learning and experiential departments into one. The resultant restructuring includes shared leadership over both areas on two campuses and shared responsibilities. Communication and sharing between the two departments has grown, which will support students as they progress into their advanced rotations. The changes will show improved use of personnel and their expertise, and the impact on education within the curriculum. Implications: By combining the two divisions, staffs have identified commonalities within the curriculum and used this to reinforce concepts and behaviors in the lab and on rotations. Systems flow better between these two practice components of the curriculum. Tangible outcomes include sharing of grading rubrics, cross-use of faculty, and continuity for students in learning and progression. In addition, the duo-department concept supports work to identify students who may struggle in the practical components of the curriculum, which supports earlier intervention. This decision has resulted in a logical connection between the two areas.

Simulating a Pandemic Influenza Event on a Large Scale as an Interprofessional Education Exercise. Lynne Tomasa, The University of Arizona College of Medicine, John E. Murphy, The University of Arizona, Andreas Theodoro, The University of Arizona College of Medicine, Cathy Michaels, The University of Arizona College of Nursing, Hal Strich, The University of Arizona College of Medicine, Nancy Coleman, The University of Arizona College of Medicine, Ronald Weinstein, The University of Arizona College of Medicine. Objectives: 1. Describe the pandemic flu interprofessional education (IPE) event 2. Discuss the resources needed to put on an event of this magnitude 3. Determine the types/backgrounds of individuals needed to provide contextual support for a pandemic flu exercise 4. Focus on ethical issues surrounding limited resources (respirators) and requirement to work for health professionals Method: An interprofessional team of educators planned this event over a six month period. Over 450 medical, nursing, pharmacy, public health, law, and social work students and 35 facilitator faculty from the same colleges participated in the event. Disaster planning professionals from the community (including former Surgeon General Carmona) staffed the incident command center and sent information to and received questions from over 70 “communities” of students via the internet with cell phones as back-up. Results: The three hour session resulted in positive ratings on a variety of scales by both students and faculty facilitators. Technical challenges could have led to major difficulties in delivering the program if they had not been worked out in advance through dry run practice sessions. Implications: This is an ideal interprofessional teamwork development event because disasters are large scale and often create need for teamwork that may not exist in normal situations. Students can readily identify the value of other professions during these events. Because this was a simulation of a disaster, participants learned that back-up systems must be in place.

Work in Progress

A P3 Longitudinal Introductory Pharmacy Practice Experience (IPPE) Consisting of Student-Identified Activities. Kathryn K. Neill, University of Arkansas for Medical Sciences, Schwanda K. Flowers, University of Arkansas for Medical Sciences. Objectives: The UAMS P3 IPPE is a 40-hour, longitudinal, self-directed experience designed to provide patient-centered care activities in a variety of settings and allows students to explore personal interests and broaden their practice perspective. Experiences expand on skills gained in P1 Community and P2 Institutional IPPEs. Students must complete at least three types of activities (shadowing, providing services or education at health fairs/screenings, “brown bag” reviews, volunteering at free clinics, providing teaching assistance in clinical skills lab, and participating in medical mission trips/student exchange programs over 1 year. Experiences are documented in E*Value using a self-assessment, verification form, and PxDx intervention record. This project evaluates the types of activities/interventions documented from student-identified IPPEs. Method: Types of activities, interventions, student role, and hours documented in PxDx from
A Rubric’s Effectiveness in Evaluating Pharmacy Student Communication Skills during a Patient Interview. Sheila M. Allen, University of Illinois at Chicago, Suzanne M. Rabi, University of Illinois at Chicago, Marieve D. Schoen, University of Illinois at Chicago, Kristen L. Goliat, University of Illinois at Chicago. Objectives: A rubric based on the 11 domains of pharmacist patient communication proposed by Kimberlin was produced in 2007 by The Ohio State University College of Pharmacy. Method: A 6 question anonymous survey was developed and administered to 20 evaluators who utilized the rubric in evaluating the performance of 169 second year pharmacy students during a patient interview. The survey asked faculty to: 1) rank the rubric’s abilities to assess student performance in communication skill area domains, 2) provide opinions in regards to the ease of use, and 3) indicate the quality of feedback provided to students. Results: Survey items will be analyzed using descriptive statistics to determine the rubric’s effectiveness in evaluating student communication skills during a patient interview. Student performance scale ranking for each communication skill domain and total points achieved within the rubric will also be assessed. Implications: Results from this study will provide insight into the rubric’s ability to provide quality feedback to students in regards to their patient interviewing skills and assist in the creation of a standardized assessment tool within the curriculum for evaluating student communication skills.

APPEs in Drug and Alcohol Treatment Programs: Highlighting the Need for Clinical Pharmacy Services. Lauren J. Jonkman, University of Pittsburgh, Vincent J. Giannetti, Duquesne University, Paul J. Freyder, The Salvation Army, Sharon E. Connor, University of Pittsburgh. Objectives: Opportunities for student pharmacists to practice providing medication therapy management (MTM) in a substance abuse population with co-morbid disorders are somewhat limited. This APPE experience provides students with the opportunity to practice in the multidisciplinary setting of a residential drug and alcohol treatment program. The experience highlights the specific needs of chemical dependency patients in treatment and demonstrates the value of clinical pharmacy services. Method: Student pharmacists from 3 universities work together to problem-solve medication-related needs and provide MTM for high-risk patients. Students work on-site throughout the week with program staff to address the complexities of care in this patient population and receive both on-site and phone support from faculty members from two local schools of pharmacy (a pharmacist and a psychologist). In addition, once each week, students and faculty preceptors meet one-on-one with patients from the program to provide structured MTM. Results: A total of 36 students have completed the rotation since the initiation of the MTM program 18 months ago. During the first year, students and faculty saw 91 patients for a total of 139 individual MTM visits. During these visits, the pharmacy team identified a total of 288 drug-related problems and made 177 medication-related recommendations. In addition, the team made 137 referrals to outside providers for additional care. Implications: Patients in this setting have significant medication-related needs that can be addressed with MTM and specifically with student pharmacist involvement. This unique program promotes multidisciplinary collaboration and cooperation between students at different schools and could be replicated across the country.

Addressing Preceptor Resistance Toward Failing Incompetent Practice Experience Students. Connie L. Smith, The University of Louisiana at Monroe, Laurel L. Andrews, The University of Louisiana at Monroe, Greg Smith, The University of Louisiana at Monroe. Objectives: The objectives of this study are to (1) determine preceptors’ neglect to assign a failing grade to practice experience students who are incompetent or potentially unsafe, and (2) obtain guidance regarding alternate evaluation methods to eliminate such preceptor neglect. Based on preceptor comments and previous students’ practice experience evaluations, many preceptors are reluctant to assign a failing grade during practice experiences. Preceptor comments have ranged from “I don’t feel comfortable assigning a failing grade” to “I don’t feel that is my responsibility”. Method: A 15-question survey was administered to pharmacy preceptors to determine their level of comfort in assigning grades to practice experience students. The participants were asked to indicate the extent to which they agreed or disagreed with each of the 15 items using a 5-point
objectives were to:

1. Expose students to medical practice
2. Reinforce basic skills
3. Bridge community and hospital experiences
4. Assess students’ and preceptors’ perceptions regarding the IPPE

**Method:** Forty-six P2 students, who completed the IPPE in the fall of 2010, were sent an anonymous 12 question survey (surveymonkey.com). Sixteen prescribers (preceptors) received a separate 9 question survey sent by fax. Survey questions were both Likert-based (Strongly Disagree to Strongly Agree) and open-ended. This study was approved by our IRB.

**Results:** Thirty-one students (67%) completed the online survey to date. Students agreed or strongly agreed to the following statements: I gained knowledge and new appreciation of physician practice (93%), I felt greater empathy towards patients (77%), the rotation was a worthwhile experience (74%), and reflections were an effective method of documenting experiences (45%). Seven prescribers (41%) completed the faxed survey to date. Prescribers agreed or strongly agreed to the following statements: Students gained a new perspective on office practice (100%), rotations were a worthwhile experience for pharmacy students (100%), and I plan to continue as a preceptor in the future (100%).

**Implications:** This IPPE is unique in pharmacy education. Based on our data, the majority of students’ and prescribers’ perceptions were positive, and the course seems to have accomplished its intended purpose. We may wish to reconsider the use of reflections as the primary assignment type for the experience.

**Assessment of P4 Student Perception/Understanding of Native American Healthcare as Experienced in Community APPEs.** Katherine S. Hale, The University of Montana, Cherith Smith, Missoula Indian Center. **Objectives:** Describe fourth year pharmacy student perception/understanding of Native American healthcare based on experiences in community advanced pharmacy practice experiences (APPEs). **Method:** Students completing community APPEs at sites in Missoula have the opportunity to spend four or more days per 4-week rotation cycle at the Missoula Indian Center (MIC). The MIC is an Urban Indian Health Program (UHP), primarily funded by the Indian Health Service (IHS). It provides programs such as routine medical/dental services, diabetes care, youth/elders programs, social services, and enhanced chemical dependency services. Student pharmacists assist the pharmacy preceptor in a variety of different projects and activities associated with these programs. Upon finishing their APPE, students complete a short-answer questionnaire describing their perception and understanding of the Native American population and IHS before and after their experience. Students are asked how the experience changed their perception/understanding; what barriers they identified for patients seeking and/or getting care in the IHS setting; how they saw these barriers being addressed; why UHPs are important for the Native American community; and what role pharmacists can play in this setting. **Results:** Preliminary results indicate that students have a variety of different views/understanding regarding Native American healthcare, with changes in perception occurring with each experience. Students identify numerous barriers for patients and areas where pharmacists may become involved to improve care. **Implications:** Student participation in this activity enables them to explore healthcare from a cultural perspective. By reviewing comments provided by students in their fourth professional year, future curriculum topics can be explored.

**Assessment of the Impact of Service on Student Values Using a Community Engagement Survey.** Ann M. Ryan-Haddad, Creighton University, Rhonda M. Jones, Creighton University, Kelli L. Cooper, Creighton University, Lisa L. Black, Creighton University, Jennifer A. Furze, Creighton University, Teresa Cochran, Creighton University, Gail M. Jensen, Creighton University. **Objectives:** Creighton University is a Jesuit Catholic school that embraces the core values of service to others, the inalienable worth of each individual, and appreciation of ethnic and cultural diversity. In congruence with these values, we developed the IPPE curriculum to include health-related service learning as part of the student’s professional development throughout the first three years of the curriculum. The purpose of this project is to determine the impact of service requirements on student values. **Method:** All P1 students in the campus pathway voluntarily completed the Community Engagement Values questionnaire day one (pre) and the last day (post) of the fall semester. Questions were multiple choice and Likert scale and included identification of service opportunities in which they participated, hours of service, time spent...
in a medically underserved community, and previous education. Value questions included: community engagement as social responsibility; self and societal impact; personal and professional duty. Responses will be tabulated and evaluated for differences between pre and post (correlation analysis and paired t test). **Results:** Student demographics, service opportunities in which they participated, hours of service, time spent in a medically underserved community, and previous education will be presented. Value questions will be presented as significance of difference pre and post. **Implications:** Data presented will provide an example of how to incorporate health-related service into the IPPE curriculum and information regarding the impact of service requirements on student values.

**Bridging the Classroom and Practice: Creating and Documenting Connections between a Didactic Curriculum and IPPEs.** Margarita V. DiVall, Northeastern University, Eric Hinderleider, Northeastern University, Robert Blaser, Northeastern University, Mark L. Yorra, Northeastern University, Debra A. Copeland, Northeastern University. **Objectives:** Assess student perceptions about the connections between our didactic curriculum and Introductory Pharmacy Practice Experiences (IPPEs) and collect strategies used by faculty to integrate and reinforce IPPEs knowledge and skills in the classroom. **Method:** Northeastern University School of Pharmacy currently uses a cooperative education model to fulfill the IPPE requirements. Students complete 3, 4-month IPPEs: the two ACPE required and one elective, for a total of 12 months of 40 hours per week experience. We surveyed P1 students after the first IPPE and P4 students after completion of all IPPEs and didactic coursework about IPPE-classroom connections. IPPE coordinators, preceptors, and faculty are being interviewed about current methods used to incorporate student practice experience with lecture material. **Results:** Survey response rates were 75% for P1 and 85% for P4 students. 88% of P1 and 50% of P4 students strongly agreed or agreed (SA/A) that there are obvious connections between knowledge and skills obtained during IPPEs and learned in the classroom. 73% of P1 students and 60% of P4 students SA/A that additional emphasis should be placed on strengthening these connections. IPPE-classroom connections strategies utilized by faculty and preceptors will be presented at the meeting. **Implications:** While most students recognize sufficient links between practice and the classroom, there are opportunities for enhancing these connections. Engaging stakeholders informs additional recommendations which can further improve connections between IPPEs and didactic coursework.

**Development of Quality Assurance Procedures for Introductory and Advanced Practice Experiences.** Christina E. Munson, University of Kentucky, Anne Policastri, University of Kentucky, Helen Garces, University of Kentucky, Patricia R. Freeman, University of Kentucky. **Objectives:** To describe the current quality assurance procedures for Introductory and Advanced Practice Experiences as well as ongoing efforts to improve those procedures. **Method:** The University of Kentucky College of Pharmacy’s Experiential Education Team has established procedures for assessment of students and preceptors during pharmacy practice experiences. With the addition of a full-time staff person in 2007 responsible solely for assessment of pharmacy practice experiences, we are in the process of using assessment to facilitate constant quality improvement of our rotation sites and preceptors. Quality assurance procedures include site visits, student evaluations, preceptor evaluations, informal surveys of students and preceptors as well as exit surveys of graduating students. **Results:** During the 2010-2011 rotation year, assessment results were quantified. Site averages as well as overall averages were examined for trends as well as outliers. Sites that had both introductory and advanced experiences were examined to see if there were any common themes. Sites that consistently were outliers were flagged and marked for monitoring. **Implications:** Quality assurance procedures are mandated by ACPE Guideline 14.7 whereby all schools of pharmacy should have procedures established for these purposes. The documentation in the literature of these procedures is limited and with the establishment of many new schools of pharmacy, there is a clear need to show how current programs are implementing quality improvement of pharmacy practice experiences.

**Development of a Rural Track Option for Advanced Pharmacy Practice Experiences.** Jaime R. Bobinmyer-Hornecker, University of Wyoming, Michelle L. Hilaire, University of Wyoming, Cara A. Harshberger, University of Wyoming. **Objectives:** An essential component of the University of Wyoming School of Pharmacy’s mission is “…to develop outstanding pharmacists capable of delivering patient-centered care in a rural-frontier environment.” The primary objective of this study is to explore the logistics of developing a rural track option for fourth-year pharmacy students to pursue when completing their advanced pharmacy practice experiences (APPEs). **Method:** All pharmacy students currently enrolled at the University of Wyoming School of Pharmacy will be asked to complete a survey to determine interest and assess the needs of those who may wish to pursue the rural track option. An evaluation of current experiential sites and rotation opportunities will be conducted to determine their fit as part of this unique pharmacy practice. Identification of new sites and experiences will also be explored as potential rotation options for the rural track. **Results:** Results of the interest and needs assessment will be presented. Additionally, a sample of rotation opportunities, experiential sites, and a tentative rotation schedule will also be presented. **Implications:** Many students who attend the University of Wyoming School of Pharmacy choose to stay in Wyoming to pursue their pharmacy practice upon graduation. Because Wyoming is considered a rural-frontier state with its own unique healthcare needs, we anticipate that the rural track APPEs will better prepare students for their pharmacy careers in Wyoming, as well as other areas of the country serving a primarily rural population.

**Development of an Advanced Pharmacy Practice Experience in Surgical Care.** Michael C. Berger, University of Kentucky, Sandy T. Berger, Owensboro Medical Health System, Sarah T. Raines, Owensboro Medical Health System. **Objectives:** To describe and assess a unique advanced pharmacy practice experience (APPE) in the pre-, peri- and postoperative setting. **Method:** Students were oriented to a surgical services pharmacist practice model. Students participated in clinical pharmacist contributions to the surgical process, including: pre-operative assessment, direct observation of drug effects in the operating room, post surgical care and quality improvement initiatives. Students were partnered with different operating room practitioners to gain an understanding of their role and the way their discipline interacted with the pharmacist. The APPE was assessed by review of student self evaluation questions which included rating scale and open ended questions; the APPE was also evaluated based on the level of voluntary student selection. **Results:** This APPE was well received by the students. Student responses to the APPE were positive and reflected student perception of an overall gain in knowledge in medication use in the surgical population. The percentage of rotation months filled versus empty increased to 100% since the rotation’s release in 2008 indicating an increased level of student interest in surgical services. **Implications:** The surgical services APPE provided students the opportunity to gain knowledge of the distributive and clinical aspects of surgical services pharmacist practice pharmacy. Additionally, this APPE allowed students to understand the role of the pharmacist in the surgical care team.
**Development of an Emergency Medicine Advanced Pharmacy Practice Experience.** Anne Policastro, University of Kentucky, Stephanie N. Baker, University of Kentucky HealthCare, Kyle A. Weant, University of Kentucky HealthCare. **Objectives:** To describe the development of the University of Kentucky College of Pharmacy’s Emergency Medicine Advanced Pharmacy Practice Experience (APPE) at the University of Kentucky Chandler Medical Center. **Method:** Emergency Medicine (EM) is an evolving and increasingly recognized practice area for pharmacists. As interest and professional opportunities continue to expand in this therapeutic arena, it is imperative for students to become cognizant of the various aspects of this unique specialty. The University of Kentucky Chandler Medical Center is a 489-bed teaching hospital and serves as the Level I trauma center for the area. The Emergency Department (ED) has 65 beds and has approximately 55,000 patient visits per year. Full-time clinical pharmacy services to the ED began in 2006. Pharmacy residents rotate through the ED, and an EM PGY2 residency was started in July 2010. The clinical specialists in this area have developed two elective courses at the College of Pharmacy in emergency medicine and clinical toxicology. Once the electives were developed, the next logical step was the addition of an APPE pharmacy student rotation. **Results:** Student objectives and rotation activities will be described, and the students’ evaluations of the rotation will be presented along with comments about their experience. Lessons learned from the first six students will be presented in addition to any resulting changes. **Implications:** The goal of this rotation is to provide a clinical practice environment for students to apply both clinical and communication skills necessary to interact in a multidisciplinary emergency medicine environment.

**Diabetes Education in the Utah Navajo Health System: Using Students in HRSA’s Patient Safety Collaborative.** Elizabeth W. Young, The University of Utah, Laura Shane-McWhorter, The University of Utah, Daniel Clegg, The University of Utah, Adam Wolfe, The University of Utah. **Objectives:** To develop a diabetes education program at a Utah Navajo Health System (UNHS) clinic using students on an ambulatory care advanced pharmacy practice experience (APPE). **Method:** Blanding, Utah is a rural city about 315 miles southeast of Salt Lake City. UNHS manages 4 Community Health Centers, serving patients from 3 dominant cultures: Navajo Tribe, Ute Tribe, and Caucasian American. The prevalence of type 2 diabetes among the Navajo Nation is approximately 22.9% in persons over 20 years of age. The role of the clinical pharmacist in diabetes management at UNHS had not been defined. As part of HRSA’s Patient Safety Collaborative and under the supervision of University of Utah College of Pharmacy faculty, two pharmacy students piloted a program to establish clinical pharmacy services in the Blanding Family Practice Clinic, focusing on diabetes education. The target population was identified as 79 adult patients whose A1c was >9%. **Results:** The students had an initial meeting with 23 patients over a 5 week period; 14 (61%) were female. The average age was 49 years. The average A1c was 10.6% and average BMI was 35kg/m2. The students provided recommendations to providers regarding drug therapy, lab results, and health maintenance. Providers accepted 43% of their recommendations. The service was favorably regarded by the providers and resulted in the hiring of a pharmacist to provide diabetes education. **Implications:** Students developed self-confidence that has carried them through to other experiences. Recommendations by pharmacy students can have a positive impact on patient’s health.

**Effectiveness of Faculty-Facilitated Institutional Introductory Pharmacy Practice Experiences at Area Hospitals.** Nicole L. Metzger, Mercer University, Angela O. Shogbon, Mercer University, Pamela M. Moye, Mercer University, Phillip S. Owen, Mercer University, Melissa M. Chesson, Mercer University, Bobby C. Jacob, Mercer University, Kathryn M. Momary, Mercer University. **Objectives:** To assess the effectiveness of three diverse, yet standardized, hospital-based, faculty-facilitated, Introductory Pharmacy Practice Experiences (IPPE) at meeting instructional objectives related to the Accreditation Council for Pharmacy Education (ACPE) standards. **Method:** A pre-test and post-test were administered to students to assess their acquisition of basic institutional pharmacy knowledge and perceptions of their ability and interest in hospital pharmacy practice. The test included demographic, open-ended, and multiple choice questions designed to assess objectives in line with ACPE standards. Student pre-test and post-test scores were compared using paired t-tests. Differences in test scores and perceptions were also assessed based on year, site, and work experience. **Results:** Analysis of 88 students from year one and preliminary data from 40 students in year two showed significant improvement in test scores between the pre- and post-tests in year one (71.4% vs. 77.0%, p < 0.01) and year two (69.8% vs. 83.1%, p < 0.001). In year one, students with prior hospital experience (30%) scored higher on the pre-test; however, this difference was not maintained at the post-test. In year two, no difference in scores was observed for students with prior hospital experience (25%) compared to those without. Students reported improved confidence in their knowledge of hospital practice (p < 0.001 in both years) at the conclusion of IPPE. Students’ likelihood to pursue a career in hospital pharmacy did not change (p = 0.184 in year one, p = 0.686 in year two). **Implications:** The achievement of ACPE-based objectives for IPPE students can be quantitatively assessed by examination and may result from a standardized approach to IPPE structure.

**Effects of Scheduling Institutional Practice Experiences in the Same Facility on Performance and Perceptions of Learning.** Vincent C. Dennis, The University of Oklahoma, Mark L. Britton, The University of Oklahoma, Richard Wheeler, Mercy Health Center. **Objectives:** To determine how continuously assigning the same students to the same institutional practice setting over 4 years impacts their learning experience and performance relative to students receiving random assignments in multiple institutions. **Method:** After developing an agreement with a local hospital institution in 2009-10, student volunteers were sought to participate in a longitudinal experience at the facility. Eight students per year have been assigned as P1, P2, P3 and P4 students. The introductory pharmacy practice experiences comprise 4 hours in the P1 year, 20 in the P2 year, and 80 in the P3 year. The advanced pharmacy practice experiences include 160 hours for 3 consecutive months consisting of an institutional pharmacy practice rotation, acute care rotation, and subspecialty experience, respectively. Preceptor and student evaluations between continuous and discontinuous assignments will be analyzed to determine any differences. **Results:** 40 students have been enrolled in a continuous experience at the same health system since the 2009-10 academic year. Pre- and post-intervention student evaluation scores for the learning experience at the facility have shown improvement across all evaluation areas. Further analysis of objective testing measures is pending. **Implications:** Transitioning students from IPPE to APPE assignments at the same institution may improve student performance and assessment of learning experiences.

**Evaluation of Technology Incorporating Wi-Fi and Touch Interface to Improve Faculty-Student Interaction in Classroom.** Pradeep K. Karla, Howard University. **Objectives:** The objective of the proposal is to evaluate Classroom Presenter technology integrating wireless internet and tablet touch interface providing a real time communication...
platform for faculty and students in a classroom. Various parameters such as Improved Faculty-Student Communication, Efficient Delivery of Subject Matter, Improved Student Understanding, Additional Feedback Channels and Improved Student Engagement during a Lecture were evaluated. **Method:** Instructor and students are equipped with tablet laptops with built-in wireless adapters. Howard University, School of Pharmacy is equipped with a 802.11n wireless router for wireless internet access. Classroom Presenter software version 3.1 was employed. Faculty and student tablet computers were bridged via the wi-fi network to enable mutual communication on touch interface using a stylus. Survey monkey was employed to obtain confidential evaluation from the students at various stages of Pharm.D. curriculum.

**Results:** Preliminary confidential evaluation of Survey Monkey analysis reported that >92% of students observed an increase in faculty-student communication, efficient delivery of subject matter, improved engagement and understanding by students compared to traditional powerpoint mode. **Implications:** Integration of Wi-fi and tablet touch interface bridging the faculty and student laptops using Classroom Presenter lead to statistically significant increase in communication between faculty and students in a classroom. The technology provided additional feedback channels providing a dynamic real time communication platform. A comprehensive evaluation with large student subsets in different courses is being performed in light of encouraging preliminary results.

**Evaluation of a Health Services Research IPPE Module.** Susanne G. Barnett, University of Wisconsin-Madison, Susannah Moroney, Pfizer, Scott Draeger, RESTAT. **Objectives:** To evaluate second-year Doctor of Pharmacy students’ knowledge of and confidence levels in working with a health services research (HSR) Introductory Pharmacy Practice Experience (IPPE) module. **Method:** One hundred thirty-six students enrolled in an IPPE course completed an independent HSR module. During a module assignment, students analyzed epidemiologic and treatment data from a de-identified health services database. Students answered a series of questions about their analyses, used literature to make evidence-based interpretations of findings, and employed health promotion and disease prevention strategies to the patient population. Students were invited to participate in a voluntary, anonymous survey prior to and after participation in the HSR module. The survey used multiple-choice questions to assess student knowledge of HSR and a 7-point Likert scale (1—not at all confident, 4—confident, and 7—outstandingly confident) to assess confidence in working with HSR. **Results:** Forty students completed the HSR survey prior to the initiation of the IPPE module. The average score (standard deviation) on the knowledge portion of the HSR survey was 72.9% (17.6%), with the most challenging question relating to identifying the four core areas of HSR. Confidence questions were divided into two groups, those relating to 1) knowledge and 2) application of HSR. Students were somewhat confident (median, range) in both knowledge (3, 1-6) and application (3, 1-6) of HSR, reporting the least confidence in using Structured Query Language to analyze databases (2, 1-5). **Implications:** Pre-module survey results indicate an opportunity to enhance student knowledge of and confidence in HSR through an independent IPPE experience.

**Expansion of Services in a Community Diabetes Clinic Network to Encompass Management of Cardiovascular Disease.** Wesley A. Nuffer, University of Colorado, Kristen A. Brown, University of Colorado, Christopher J. Turner, University of Colorado. **Objectives:** To utilize an existing network of eleven community diabetes clinics across the state of Colorado and expand the services provided by pharmacy students to include the management of hypertension and dyslipidemia. **Method:** A network of pharmacy student-supported diabetes clinics has already been established in 11 different rural or underserved counties across the state of Colorado, run by P4 students year-round during their APPE rotations. Data collection have shown statistically significant improvements in A1C, blood pressure, triglycerides and LDL-C values in patients with diabetes receiving 6 months of education from students. Utilizing this existing infrastructure, funding was sought to establish disease management programs for patients with hypertension and/or dyslipidemia. **Results:** A grant proposal was funded on January 31st, 2011 to support this expansion project. Initial team meetings are currently being scheduled to begin laying out the foundation and logistics of what each disease program will look like. The implementation is planned for the summer of 2011. **Implications:** Expansion of chronic disease management services at these established student-supported clinics will increase the free access to care and education and should improve the health of citizens in the eleven different communities served across the state of Colorado. The expansion will also increase the numbers of patients seen by P4 students, challenging the students to see more patients and to provide care on a greater breadth of chronic diseases in each community.

**Faculty Workload Associated with Establishing IPPE Distance Pathway Sites.** Rhonda M. Jones, Creighton University, Kelli L. Cooper, Creighton University, Maryann Z. Skrabal, Creighton University, Kelly J. Anderson, Creighton University, Teri Miller, Creighton University. **Objectives:** Creighton University School of Pharmacy and Health Professions not only offers a traditional campus pathway, but also offers a distance pathway for attainment of the doctor of pharmacy degree. With implementation of new IPPE requirements, experiential education now includes approximately 30% of the curriculum. The purpose of this study is to determine faculty administrative workload associated with establishment of IPPE sites for distance pathway students. **Method:** Experiential workload will be measured by faculty documenting the total time required throughout the spring semester to set up, approve, and schedule experiential sites for students enrolled in PHA323 IPPE-I. Specific workload items that will be measured include student and preceptor e-mail communications, phone conversations, electronic database scheduling, and office visits. **Results:** IPPE curricular components, site and preceptor criteria, and experiential office structure will be presented. Workload data, including number and time spent for student and preceptor email communications, number and time spent with student and preceptor phone conversations, number and time spent scheduling students in the electronic database (E*Value), and number and time spent with office visits will be presented. Descriptive information regarding opportunities, advantages, and challenges of the distance pathway process will also be presented. **Implications:** Data presented will provide information regarding faculty administrative workload associated with distance pathway introductory experiential education and will assist other schools in evaluating experiential education workload.

**Faculty and APPE Students Impact on Clinical Nutrition Service at APPE Site.** Christopher M. Miller, University of Kentucky, Patricia R. Freeman, University of Kentucky, William P. Allen, Norton Healthcare, Leslie K. Kenney, Norton Healthcare. **Objectives:** The University of Kentucky (UK) established an academic-practice partnership with Norton Healthcare in Louisville in 2007. As a result, a faculty member was placed at the partnerships site, a 450 bed community hospital. The faculty member’s distribution of effort includes 25% teaching/instruction, 20% clinical service, and 10%...
scholarship components. The purpose of this project is to assess the impact of the faculty member and APPE rotation at the partnership site with regard to service enhancement, generation of scholarly activity, and perceived satisfaction. **Method:** A clinical service and APPE rotation in nutrition support was established by the UK faculty member in 2008. The nutrition APPE students are encouraged to consider scholarly projects during the rotation. Students pursuing post-graduate residencies are enthused with this opportunity. To date multiple projects have been completed including several quality improvement projects, a service/rotation satisfaction survey assessment, and an on-going nutrition education competency assessment program. **Results:** The quality improvement projects have resulted in a change in the standard parenteral nutrition (PN) order form. Improvement in patient care has been documented based on fewer interventions required to correct metabolic abnormalities. The assessment survey has demonstrated satisfaction with the service and rotation from both dietitians and pharmacists. The comprehensive education project has demonstrated significant learning based on analysis of pre/post test results to date. Several of these projects have resulted in scholarly presentations at national meetings. **Implications:** The academic-practice partnership service is enhancing the quality of patient care at the practice site and providing national exposure for UK’s academic partner through scholarly activity.

**Fall Prevention Collaboration with IPPE Pharmacy Students and VNA East.** Philip M. Hritcko, University of Connecticut, Peter J. Tyczkowski, University of Connecticut, Lisa Bragaw, University of Connecticut, Mary B. Withey, VNA East, Inc., Allison J. Breault, VNA East, Inc. **Objectives:** According to the Connecticut Collaboration for Fall Prevention, in the United States, 16 percent of all emergency department visits and almost 7 percent of all hospitalizations are for fall related injuries making it one of the most common health problems for older adults. Many factors contribute to increased fall risk. This project focused on the need for medication reviews and recommendations for those drugs associated with an increased risk of falls. **Method:** UConn P3 Introductory Pharmacy Practice Experiences (IPPE) students review VNA East patient records focused on identifying potential medication-related problems, including reducing poly pharmacy and substituting for potentially inappropriate medications, which may contribute to fall risk. Students perform a comprehensive medication review, formulate an action plan, making recommendations regarding any changes in therapy, and report these findings to a pharmacist preceptor. The pharmacist preceptor reviews these recommendations, makes necessary adjustments, and forwards the recommendations to the case manager at VNA East. The VNA case manager will in turn review these recommendations and when appropriate, follow-up with the patients’ physician. **Results:** Pharmacy students learn the core elements of medication therapy management (MTM) through this IPPE and collaborate in an interprofessional environment with members of the VNA East staff. **Implications:** Pharmacy students focused on potential medication related fall risk factors can possibly reduce the incidence of fall related events in this VNA patient population while affording them the opportunity to work collaboratively with other health care professionals towards better patient care.

**Financial, Personnel, and Curricular Characteristics of Professional Experience Programs: A 10-year Update.** Jennifer Danielson, University of Washington, Arthur F. Harralson, Shenandoah University, Teresa A. O’Sullivan, University of Washington, Stanley S. Weber, University of Washington. **Objectives:** As colleges and schools of pharmacy have implemented accreditation Standards 2007 and many new schools have opened, the structure and operation of professional experience programs (PEPs) have changed significantly. Experiential education now constitutes 30% of curricula and highly influences school-wide administrative and budgetary decisions. An updated analysis of characteristics of pharmacy PEPs across the country is needed, since the last such snapshot was taken in 2001 (AJPE 2003; 67 (1) Article 17). The purpose of this study will be to assess financial, personnel, and curricular characteristics of PEPs in pharmacy schools nationwide as a follow-up to this previously published survey. **Method:** The questionnaire used in the previous survey is currently being revised and tested (with subsequent review by Human Subjects Division planned) before distribution in April to PEP faculty/directors of all accredited pharmacy schools. The web-based survey will be distributed via email with reminders at 2 and 4 weeks. Non-respondents will receive phone follow-up to obtain at least an 80% response rate. Budgetary information will be obtained from AACP directly, similar to the previous survey. **Results:** Final results (expected in June 2011) will show the number and titles of PEP faculty/staff, number of practice sites for both IPPE and APPE, and structure of practice faculty relationships according to class and budget size. Estimates for cost of experiential education per student will be calculated and compared to results obtained 10 years ago. **Implications:** Final results/analysis will provide benchmarks for assessment, comparison, and standardization as PEP directors/faculty begin addressing recently released ACPE Guidelines 2011.

**IPPE Students Participate in Hawaii Asthma Friendly Pharmacy Project for Department of Health.** Carolyn S.J. Ma, University of Hawaii at Hilo, Lara Gomez, University of Hawaii at Hilo. **Objectives:** Explore the feasibility of utilizing students for administration of Asthma Control Test (ACT), Asthma Action Plans and inhaler education. Monitor collection of ACT scores and provide data to the Department of Health Asthma Control Program. Engage community pharmacies in East Hawaii Island and Oahu to participate in the DOH Asthma Friendly Pharmacy Project. **Method:** Students are trained in their PY1 to administer the ACT and do so when they rotate in the IPPE community rotation for one semester. PY2’s administer the ACT in their semester of ambulatory care IPPE Students submitted ACT scores along with two additional questions when inhalers were prescribed or dispensed. PY2 and PY4 students also demonstrate proper inhaler technique to appropriate patients. **Results:** From Fall 2009-Spring 2010, students administered 68 ACT’s over two semesters. The average ACT score was 16.49 (scores<19 indicate uncontrolled asthma). Nine percent of patients surveyed received an ACT in the past six months. Eleven percent of patients received a previous personal Asthma Action Plan. Challenges faced by the students included too short of a time at the experiential site, sporadic preceptor support due to time constraints, and disruption of workflow to administer the ACT. **Implications:** This initial effort confirms that PY1 and 2 students can administer ACT’s if given appropriate support and guidance. APPE students will be required to administer ACT surveys, actions plans and provide education on correct inhaler technique to patients in order to demonstrate proficiency in their required community APPE rotation. Teaching method reiterates pharmacist education in all asthma patients.

**IPPE/APPE’s Influence on Feelings about Future Possibility of Practice in a Medically Underserved Area.** Sharon E. Conner, University of Pittsburgh, Lauren J. Jonkman, University of Pittsburgh, Lynne L. Williams, Area Health Education Center. **Objectives:** All University of Pittsburgh student pharmacists in their second year are required to complete at least one four-hour IPPE experience
in a free clinic. Students may also elect to complete additional experiences in elective courses and APPEs in underserved clinics. Working in collaboration with our local AHEC, we captured feelings regarding work in an underserved area before and after each underserved clinic experience. The objective was to track if an underserved clinic experience had an influence on the student’s future plan to practice in a medically underserved area (MUA). Method: All second professional year students (P2s), third professional year students (P3s) in an underserved elective course and all fourth professional year students (P4s) who completed their APPE ambulatory care experience in underserved clinics were eligible to complete the pre and post surveys. Results: A total of 54 students completed the survey, 38 P2s, 12 P3s, 4 P4s. The majority were white, Caucasian (85%) and female (74%). At the beginning of the experience, only 11% of students agreed with the statement “I plan to eventually practice in a MUA.” At the end of the experience, 51% reported that the experience made it more likely that they would eventually practice in a MUA. Implications: Experiences in free clinics and other underserved settings increases interest in practicing in a MUA. Noting this, schools of pharmacy should continue to promote service learning to meet the need for pharmacists in MUA. There remains a need to evaluate whether these experiences increase actual practice in a MUA.

Impact of Teaching Seminars to Develop Pharmacy Academicians within a Residency Program. Lee H. Nguyen, Loma Linda University, Anh-Vuong Ly, Loma Linda University, Carl Dominguez, Loma Linda University. Objectives: Background: Loma Linda University implemented a teaching certificate program as part of the Pharmacy Practice Residency (PGY1). The program is designed to introduce PGY1 residents to contemporary pharmacy/health professions education, teaching styles, and philosophies. Through engagement in seminars, formal teaching experiences, recitation facilitation, and development of a teaching portfolio, residents document their progress. The purpose of this study is to evaluate the impact of teaching seminars on residents’ development as possible future academicians. Objectives: Primary endpoints are to evaluate residents teaching progress pre- and post-teaching seminar interventions. Secondary endpoints are to evaluate the strengths and weaknesses in 6 different areas of presentation. Additional endpoints will include students’ impression of resident’s delivery, professionalism and audio/visual-handouts. Method: All residents developed a baseline lecture without faculty aid or formal training. Method: All residents developed a baseline lecture without faculty aid or formal training. The lectures were videotaped, reviewed and evaluated by faculty based on a 5-scale scoring system. Evaluations were in the following areas: objectives, content, delivery, professionalism, organization, and audio/visual-handouts. The residents were then required to attend teaching seminars (20-hours), provided didactic lectures (3-hours), and facilitated in recitation (20-hours) including the development of at least 1-case. Results: Faculty evaluations for residents’ pre-vs-post-seminar average scores are as follows: objective (3.5,3.92); content (3.4,4); delivery (2.83,3.48); professionalism (3.6,4.05); organization (3.46,4.16); audio/video (3.52,3.99); overall impression (3.07,3.79); and total score (20.3,23.64), respectively. Implications: Similar teaching programs have been described in the literature; however, none have assessed each resident’s progress pre- and post- seminars through formal faculty evaluations. Teaching seminars provides a positive impact in creating a sound academic foundation within a PGY1 residency.

Impactful Introductory Pharmacy Practice Experiences (IPPEs): The Value of Safety Interventions. Cynthia J. Boyle, University of Maryland, Hoai-An Truong, University of Maryland, Alexa Hershberger, University of Maryland, James Wang, University of Maryland. Objectives: Describe the framework used to categorize and analyze safety interventions during a community IPPE. Method: Building on the Institute of Medicine’s “Crossing the Quality Chasm,” medication safety has been a focus of this four-week IPPE since 2002. Starting in 2007-2008, students in this course were required to post two safety interventions in Blackboard based on didactic information and resources such as the Institute for Safe Medication Practices. The Classes of 2011 and 2012 were the first two cohorts of the dual campus model of the University of Maryland School of Pharmacy. Their documented interventions were systematically categorized into the Food and Drug Administration Drug Safety framework by type and cause and subsequently analyzed. Results: Over one-third of the analyzed interventions sorted by cause were directly attributed to human factors. Interventions sorted by type included over dosage (28.3%) and incorrect medication (27.5%). Specific examples of interventions saved unnecessary health care expenses and potentially lives. Implications: With the ratio of IPPEs to APPEs at 1:5, the tendency has been to provide exposure and shadowing experiences during the 300 IPPE hours. With the dominant focus on Advanced Pharmacy Practice Experiences, the value and impact of community IPPEs has been underappreciated by students and preceptors. This analysis clearly shows the relevance and value of documenting safety interventions during IPPEs in a community pharmacy practice setting. Such active learning early in a student’s education may help to build an experiential repertoire that will enhance retention of knowledge and propagate the value of pharmacy services.

Implementation and Effectiveness of a Pharmacy Student Facilitated Smoking Cessation Program. Deanna W. McEwen, The University of Georgia, Kay L. Brooks, The University of Georgia, James MacKillop, The University of Georgia, Lori J. Duke, The University of Georgia, Lindsey Welch, The University of Georgia, Michelle Jones, The University of Georgia, Iraida Vega, The University of Georgia. Objectives: To describe the implementation and assess the effectiveness of a 6 week smoking cessation program conducted by second and third year pharmacy students. Method: This service learning based IPPE integrates student-led group seminars and individualized counseling to assist 36 university employees with the quitting process. The program consists of six consecutive 1-hour weekly sessions. Program materials were adapted from Pfizer’s 4 week Beat the Pack program. An initial smoking profile was collected to identify previous quit attempts, Fagerstrom dependency scores, and readiness to quit scores. Students used the ASSIST strategy to help participants develop and implement a personalized quit plan. Quit rates will be self-reported and then followed up 1 and 3 months post quit date. Other measurement tools used include a pre/post test evaluating patient smoking knowledge and awareness and a post-program questionnaire assessing participants’ perceptions and attitudes of the program. Results: Data will be collected and analyzed to evaluate: (1) a correlation between Fagerstrom dependency scores and quit rate, (2) a correlation between readiness to quit scores and quit rate, (3) quit rates achieved during the program and maintained at 1 and 3 months, (4) participant perceptions and attitudes of the student led program, and (5) the financial benefit of quitting. Implications: This smoking cessation IPPE was designed to provide pharmacy students with a valuable learning experience while providing an effective and sustainable program to help university employees be successful in the quitting process. Data obtained will be used to modify the program and improve participant outcomes.

Improving Documentation Skills: Curricular Integration of Patient Care Laboratory and Experiential Education. Holly S. Divine, University of Kentucky, Tera McIntosh, University of Kentucky, Mikael D. Jones, University of Kentucky. Objectives: Introductory Pharmacy
Practice Experience (IPPE) II is required between PY2 and PY3 years and focuses on students’ applying patient care skills in hospital practice. Many of the skills required for IPPE II are taught in the patient care laboratory (PCL) sequence. One IPPE assignment requires the student to assess a patient, identify a drug therapy problem, and create a SOAP documentation of the encounter. The graded assignment revealed a knowledge deficiency in students’ ability to appropriately record a pharmacist intervention in a “real world” situation. Close integration of PCL and Experiential Education (EE) content allowed for course faculty to quickly address this deficiency. The intent is to describe modifications made in PCL and EE curricula to address deficiencies identified in EE. **Method:** EE and PCL faculty met to review assignments from summer 2010. Specific interventions were developed to address deficiencies in the PY3 students and improve documentation skills for incoming PY1 and PY2 students. Interventions included a PY3 lab where students anonymously reviewed actual SOAP assignments from IPPE and identified areas for improvement. Additionally, the entire PCL course coordinators revised the documentation teaching process and tools from PY1-PY3 to address the deficiency. Finally, the IPPE preceptors received training on student expectations for documentation.

**Results:** IPPE SOAP assignments from the two consecutive summers will be compared based on appropriate quality and content and presented. **Implications:** Integrating EE and PCL curricula can facilitate student learning and identify gaps in students’ application of simulated experiences into actual experiences in pharmacy practice.

**Intervention Reports as an Educational Tool for students on Advanced Community Rotations,** Santhi Masilamani, University of Houston, Nancy D. Ordonez, University of Houston, Elizabeth A. Coyle, University of Houston. **Objectives:** Fourth year pharmacy students are required to submit twenty interventions performed on-site during their community APPE as a reflection exercise. This study examines the effect of these reports on the student’s knowledge and skills. It also analyzes the impact on the community and benefit to the site. **Method:** Pharmacist Intern intervention reports from the past three years will be analyzed to discern patterns in type of intervention and effect. Benefit to the site in the form of improved metrics or cost savings will be determined. Interventions will then be mapped back to the first three years of the curriculum to assess effectiveness of didactic and laboratory exercises on the community APPE. **Results:** Data analysis is ongoing at this time. It is expected that results will show increased metrics and benefit to the site from student interventions. It is also expected that patterns exist in the type of interventions students focus on and are able to perform on advanced community rotations. **Implications:** With increased utilization of students in the community site for clinical activities, it would be prudent to ensure specific interventions such as adherence tracking and medication therapy management activities are distinctly categorized in the interventions report. Additionally, patterns revealed will assist in fine tuning didactic and laboratory learning methods so that students present to the site with adequate tools for optimal learning.

**Log-In To Learn: The Impact of an Online Journal Club Activity for Preceptors and Students,** CoraLynn B. Trewet, The University of Iowa, Kathryn A. Schott, Drake University, Jennifer Moulton, Collaborative Education Institute, Denise A. Solits, Drake University, Jennifer Dixon, Drake University. **Objectives:** Determine the extent to which an interactive online journal club activity affects participants’ knowledge, skills, attitudes and values and the extent to which learning objectives are met. **Method:** The Collaborative Education Institute (CEI) developed Log-in To Learn, an application-based CPE activity which guides a monthly online journal club discussion for pharmacists and student pharmacists. Participants receive a copy of the research study to review and share with students and a preceptor discussion guide in advance of the live activity. A faculty expert presents an overview and analysis of the study during a live session, posing questions throughout to allow for audience participation. Evaluators assess the extent to which their knowledge, attitudes, skills, values, and patient outcomes may be affected by the activity using true/false response. **Results:** Participation to date includes 75 preceptors and 106 students, with 43 preceptors completing evaluations. Of the preceptors participating, 65.1% (n = 75) reported involving students in the activity. Participants reported their current knowledge, attitudes, skills and values were enhanced. In addition, evaluators scored (Likert 1-5 scale; 5 = excellent) activities to be appropriate for achieving learning objectives (mean 4.08) and would likely improve practice and/or enhance patient outcomes (87.4% responded “true”). **Implications:** An online interactive journal club activity is an effective means to enhance preceptor knowledge, attitudes, skills and values while providing an activity where students and preceptors can collaborate. Findings will guide our expansion of Log-in To Learn activities. Future evaluation may include an examination of how students are impacted in these same areas.

**Measuring the Impact of Interprofessional Education Experiences Utilizing Healthcare Disciplines Students on Rural Clinical Rotations,** Kristen A. Brown, University of Colorado, Wesley A. Nuffer, University of Colorado, Kari L. Franson, University of Colorado. **Objectives:** Liaison interactions between multidisciplinary students on clinical rotations in rural and underserved areas of Colorado; measure the implications to community health and create a sustainable model for interprofessional practice. **Method:** An interprofessional rural training and service collaborative was formed and identified areas of Colorado where healthcare disciplines students on rotations could partner to engage in patient care services like health and wellness education and multidisciplinary rounding experiences. Following each P4 rural APPE rotation, students were asked to complete a survey regarding the patient populations and services they performed, the number of patients impacted and with which other discipline(s) they delivered care. **Results:** Rotation surveys collected show approximately 50 Pharmacy students have completed interprofessional rural experiences in 6 identified partnership regions with at least 4 other disciplines. Over 1000 patients have been impacted through education programs, rural immersion experiences, medication reconciliation, disease-state management and health-promotion/disease-prevention events. Students report greater appreciation for and attitudes towards rural practice initiatives and interprofessional contributions to care. **Implications:** Support of interprofessional education has allowed for the creation of rural interest scholarship awards for P1-P3 pharmacy students, stipends for rural rotation experiences and created a sustainable framework for student delivery of care. Ongoing incorporation of telemedicine and converging technologies, development of an interprofessional clinic site dedicated to rural patient service through which students will rotate, and continued examination of the impact rural health students have on patient care will be monitored and reported as a model of interprofessional practice.

**Meeting the Health Needs of South Texas through Service Learning,** Beverly A. Talluto, Texas A&M Health Science Center, Gary L. Frech, Texas A&M Health Science Center, Manuel Tamez, Texas A&M Health Science Center. **Objectives:** Enhance direct patient care service learning programs that meet the needs of the community, bring health education, promotion and care to South Texas, and instill...
in students an ethic of service in experiential education. **Method:** A variety of direct patient care service learning (SL) activities is required in IPPE courses. Descriptions of activities and learning objectives are posted in Blackboard (Bb). A calendar informs students of upcoming SL events: type, date, time and capacity. Request Forms are approved by the preceptor, Student Affairs and the Office of Experiential Education prior to the event. Each SL event is validated and documented at the site. SL hours are documented in Bb and available for student viewing. Students record their activities and hours on a personal record. Experiential personnel actively solicit opportunities for students to participate in SL events. **Results:** In partnership with a pharmacy chain, students assisted in over 800 immunizations and completed 2000 hours of service learning in the fall 2010. P3 students participated in a week long direct patient care experience in community health centers throughout South Texas. Students are engaged in ongoing health fairs, blood pressure and diabetes screenings, and health education for K-12 students through Texas Community in Schools program. Students are engaged in diabetic training and Medication Assistance Programs with the Coastal Bend Health Education Center. **Implications:** Service learning events provided students with the ability to: identify community needs, meet these needs, and enhance interpersonal communication skills with patients and professionals in diverse practice settings.

**Pre-Matriculation Pharmacy Experience as a Predictor of Academic Success in Two Pharmacy Programs.** Paul Oesterman, Roseman University of Health Sciences, Youness R. Karodeh, Howard University. **Objectives:** Factors impacting and predicting academic success in pharmacy programs and on the NAPLEX exams have been previously examined. The objective is to determine the impact of having pharmacy technician experience prior to matriculating into a 3 year accelerated pharmacy program or a 4 year traditional program. **Method:** Pharmacy students at both a 3 year accelerated program (USN) and a 4 year traditional program (Howard) were surveyed to determine if they had any pharmacy technician experience, and how much, prior to matriculation. This data was then compared to their academic performance in basic science courses, integrated therapeutic disease state courses, and Top 200 courses. Data was analyzed to determine if a statistically significant correlation could be established. **Results:** As anticipated, the data demonstrated significantly improved performance in the Top 200 courses at both the accelerated and traditional programs, and slightly improved performance in integrated therapeutics courses, and no statistically significant impact in basic science courses. The improved performance did directly correlate to the amount of pharmacy experience prior to matriculation into the respective pharmacy program. There was no significant difference observed between the accelerated and traditional programs. **Implications:** While demonstrating that prior pharmacy experience does appear to have a direct and positive correlation to academic performance it cannot be used alone as a predictor of academic success, and should be incorporated into the interview process for future classes. Future analysis could include comparison of data to NAPLEX scores.

**Promoting Children’s Health: An Afterschool Health Literacy Program for IPPE Service.** Ann M. Ryan-Haddad, Creighton University, Kelli L. Cooper, Creighton University, Rhonda M. Jones, Creighton University, Kimberly J. Begley, Creighton University, Kelly S. Nelson, Creighton University, Teresa Cochran, Creighton University, Kathy A. Flecky, Creighton University, Kate Martens Stricklett, Creighton University. **Objectives:** To describe a pilot project for first year pharmacy students participating in a health literacy program for an aftercare program for an inner-city parochial elementary school. **Method:** Health professions faculty and students from pharmacy, occupational therapy, and physical therapy met with the administrative staff from the elementary school in the Summer of 2010 to determine health-related topics for three age levels attending the afterschool program (3-5, 6-8, and 9-12 years). The health literacy modules were created by senior pharmacy students for a clinical rotation and by physical therapy students for a scholarly project. Two 4-week sessions for IPPE Service hours were offered in the Fall 2010. Students from physical therapy (4), pharmacy (16), and occupational therapy (2) provided 200 service hours during these sessions. Elementary students, their parents, and first year pharmacy students completed a qualitative questionnaire regarding their experiences with the health literacy program. **Results:** Questionnaire results showed that elementary students enjoyed the interactive games and hands-on learning activities, parents appreciated the parent handouts related to the health topics, and first year pharmacy students noted the service provided an opportunity to enhance cultural awareness and communication skills. **Implications:** The success of this pilot project is allowing for continued offerings in the Spring 2011, several first year students reported they would like to participate again, and faculty are exploring offering the health modules during school hours to reach all of the children at the school.

**Reaching Out: Evaluation of Online Preceptor Development Modules for Multiple Schools.** Kathryn A. Schott, Drake University, CoraLynn B. Trewet, The University of Iowa, Denise A. Soltis, Drake University, Nora L. Stelter, Drake University, Jennifer Moulton, Collaborative Education Institute, Jennifer Dixon, Drake University. **Objectives:** Effectively design, deliver and evaluate ongoing development opportunities for preceptors using an online system. **Method:** The Collaborative Education Institute (CEI) created a preceptor development curriculum designed to equip preceptors with the background information they need to be successful clinical instructors. Online activities were distributed via 13 subscribing partner schools who in turn offered the activities to their preceptors. There are currently 16 activities available for preceptors. Participants receive continuing pharmacy education (CPE) at no cost to the participant and evaluate the activities using a Likert scale and true/false response. **Results:** To date CEI has accepted 1570 registrations for preceptor development activities in 39 states. Of those, 821 have completed evaluations. Participants reported (scoring a 4 or 5 on a 5-point scale) the activity positively enhanced their current knowledge (95%), patient outcomes in practice (93%), current attitudes (91%), current skills (92%), current values (80%) and was likely to enhance patient outcomes (75%). In addition, evaluators reported that activities were appropriate for achieving learning objectives (97%). Overall activity quality ranged from 4.17 to 4.38 on a 5-point scale (5=Excellent). **Implications:** An online preceptor development series is an effective means to enhance preceptor knowledge, attitudes, skills and values. Preceptors who completed the activities responded positively to topics and overall quality. Findings will guide individual schools’ professional experience programs and their future preceptor development activities.

**Relationship Between Preceptor Evaluations of Communication Skills and Student Participation in a College-Wide Patient Counseling Competition.** Catherine L. Hatfield, University of Houston, Lynn Simpson, University of Houston, Nancy D. Ordonez, University of Houston, Elizabeth P. Pitman, University of Houston, Santhi Masi-lamani, University of Houston. **Objectives:** The University of Houston College of Pharmacy has annual patient counseling competitions
which are open to all students of the college, and the preliminary rounds generally have excess of 100 students. Participation in this competition is voluntary; however, the Pharmacy Practice I class coordinators strongly encourage student participation. The objective of this study was to compare the preceptor-evaluated communication scores during a community-based IPPE experience of students who participate in the college-wide counseling competition to those who do not participate in the competition. **Method:** There were 133 students who rotated through a 4-week community-based IPPE experience in the summer of 2010. Data regarding communication skills was collected from all of the preceptor evaluations. Lists of all preliminary round participants in the college-wide counseling competition were also collected. For the primary comparison, students were divided into two groups: those that had participated in at least one prior counseling competition and those who had not. A secondary comparison will be made to determine if those who participated in the 2 prior counseling competitions differed from those who only participated in 1 prior competition or no prior competitions. The average scores in each communication-based category and the overall average scores for all communication-based categories will be compared between the two groups. **Results:** The results are currently being analyzed. **Implications:** If students who participate in the patient counseling competition have better communication skills on community-based IPPE rotations, the Pharmacy Practice I class coordinators may consider requiring participation in the competition as a course requirement.

**Second-Year Students Participation in Interdisciplinary Older Adult Home Visits as a Component of P2 IPPE.** Geralynn B. Smith, Wayne State University, Mary Beth O’Connell, Wayne State University, Carol Stutrud, Wayne State University, Jennifer Mendez, Wayne State University, Nelia M. Afonso, Wayne State University. **Objectives:** To assess the learning of second-year student pharmacist and first-year medical student teams in home visits to older adults living independently. The P2s evaluated the older adult’s ability to interpret prescription bottle information, learned about issues influencing medication use, and discussed social constructs on health. This interdisciplinary project included pharmacy, medical and social work students. This activity was a component of the P2’s IPPEs. **Method:** Training for all students included a team building presentation. Additional training for P2s included presentations on social constructs affecting older adults and how to use the assessment tools, and review of posted written materials. Written summaries of the preparatory activities were posted in their e-portfolios. Post-visit, P2s reported blinded medication and social construct assessments on Blackboard, and posted un-blinded summary reflections in their e-portfolios. All students completed a blinded Post-Home Survey on Blackboard. P2s completed two visits with different older adults and medical students. P2 second entry in e-portfolio is a comparison of the visits. Formal analysis of this data is to be completed by July 2011. **Results:** Initial review of the P2 e-portfolios indicates value of working with medical students as a team in interviewing older adults in their homes and the educational importance of information provided. When all second visits are completed, survey and assessment data will be analyzed. **Implications:** Preliminary information indicates P2s interviewing an older adult living independently with a medical student is a valuable educational activity. If final analysis supports this, the program will continue as a component of the P2 IPPE.

**Self Perceived Readiness for Residency: Results of a National Postgraduate Year 1 Survey.** Julie T. Truong, Touro University California, Mitchell J. Barnett, Touro University California, Eric J. Ip, Touro University California, Terrill T.L. Tang, Touro University California, Katherine K. Knapp, Touro University California, Janet L. Teeters, American Association of Health-Systems Pharmacists. **Objectives:** A thorough literature search suggests that surveying of postgraduate year one (PGY1) residents of self perceived readiness for residency is a novel endeavor. The purpose of this study was to: 1) assess PGY1 resident self perceived readiness for a residency program; and 2) examine resident level factors impacting self perceived readiness. **Method:** Residents in an American Society of Health-System Pharmacists (ASHP) accredited PGY1 program were emailed an individualized invitation to take an online survey. The survey collected demographics (e.g., age, gender, race et al), other information (e.g., pharmacy school attended, year graduated, pre-pharmacy education et al) along with self ratings (5-point Likert scale) of readiness for residency training. Areas of training readiness were stratified by: 1) organization/time management skills; 2) foundational/clinical skills; 3) project research skills and; 4) communication skills. A total of 533 usable surveys were returned for a final response rate of 29.6%. Comparisons were made using T-Tests for continuous data, Chi-Square tests for categorical data and Wilcoxon Rank Sum Test for Likert scale responses. **Results:** Results and conclusions will be presented. **Implications:** Implications will be presented.

**State Intern Licensure Requirements Pertaining to School-Sponsored Pharmacy Practice Experiences.** Mary E. Ray, Lake Erie College of Osteopathic Medicine School of Pharmacy, Kimberly Burns, Lake Erie College of Osteopathic Medicine School of Pharmacy, Janene M. Madras, Lake Erie College of Osteopathic Medicine School of Pharmacy, Tara Marie Penegor, Lake Erie College of Osteopathic Medicine School of Pharmacy, Jennifer Lynn Frankowski, Lake Erie College of Osteopathic Medicine School of Pharmacy. **Objectives:** With an increase in pharmacy programs, competition for rotation sites has grown. Pharmacy programs have to rely on neighboring and/or distant state preceptors to assist in the education of their students. Therefore, it is essential to understand each state’s requirements for students functioning as interns during school-sponsored rotations. The objective of this study is to inform the academic pharmacy community about intern licensure requirements set forth by each state as they pertain to pharmacy students completing their pharmacy practice experiences. **Method:** A seven question survey was constructed in order to gather information on licensure requirements from the Boards of Pharmacy of all 50 states, District of Columbia, and US territories. The Boards of Pharmacy were contacted by email with access to an electronic survey or by phone. If a Board did not participate, pharmacy laws and regulations were researched online to determine if the information sought regarding internship licensure during student experiences were included in such documents. **Results:** The results will be presented at the annual meeting. **Implications:** This information may assist pharmacy programs in guiding students regarding licensure requirements mandated by each state. It may also provide information to assist in a dialogue between academic leaders and state boards of pharmacy to determine if a more consistent approach to licensure for students may be developed.

**Student Pharmacists’ Perception of a Health Disparities Service-Learning Experience at a Free Medical Clinic.** Nathan A. Painter, University of California, San Diego, Eduardo Fricovsky, University of California, San Diego, Candis M. Morello, University of California, San Diego. **Objectives:** To evaluate the effectiveness and impact of a service-learning experience in a student-run free clinic. All first year pharmacy (P1) students entering pharmacy school at the UCSD Skaggs School of Pharmacy and Pharmaceutical Sciences are required to attend a 15 hour Introductory Pharmacy Practice Experience.
The Clinical Education Center Model Establishes Value for Stakeholders. Christopher M. Miller, University of Kentucky, Patricia R. Freeman, University of Kentucky, William P. Allen, Norton Healthcare. Objectives: The University of Kentucky (UK) established Clinical Education Centers (CECs) as a model for academic-practice partnerships. Each CEC is directed by a full-time faculty member. The first CEC was established in 2007 between UK and Norton Healthcare in Louisville. The CEC’s were established to: 1) enhance APPE training, 2) provide preceptor support, 3) advance pharmacy practice, and 3) provide student’s local employment opportunities. The purpose of this project is to assess the impact of the CEC in meeting the program goals. Method: After each rotation year, a survey is sent to both students and preceptors to assess the program. The primary areas assessed are perceptions of educational value, faculty support for students and preceptors, breadth of rotation offering, opportunity to integrate with the local area and stimulate employment interest, and overall perception of the CEC experience. Data from each year will be analyzed using appropriate descriptive and parametric statistics to assess the impact of the CEC in meeting program goals. Results: At the CEC inception, 29 area APPE rotations existed; this has grown to over 60 rotation experiences. Based on 2010 survey data and comparing responses from previous years, the data trend demonstrates improvement over time. Results from the statistical analysis of the data will be presented. Implications: The CEC education model appears to be accomplishing the goals set forth by the college. The college plans expansion of this model across the state.

The Use of Facebook to Stimulate Interest in an International Experiential Program. Chad Coulter, Sullivan University. Objectives: To assess if the use of a Facebook group, used as a student-driven electronic journal, during an international advanced pharmacy practice experience (APPE) to Australia stimulates interest in international APPEs in P-1 and P-2 students at the same College of Pharmacy. Method: Four students from the Sullivan University College of Pharmacy were engaged in a three-week international APPE in various cities in Australia. Students were involved in sites including veterinary medicine, inpatient care, ambulatory care, retail, research, indigenous health, and academia. A Facebook group was made to record the students’ experiences and daily journal entries during the trip. This Facebook group was revealed to the P-1 and P-2 students via in-class announcements and emails. A survey assessing the interest in international APPEs was distributed before and after departure to evaluate if this form of Facebook communication with students increased interest in these types of programs. Results: Results to be presented. Implications: Implications to be presented.

The Use of Technologies to Promote Autonomy in a Student-Staffed Medication Therapy Management Call Center. Tsu-Hsuan Yang, University of Florida, Heather C. Hardin, University of Florida, Pamela A. Sessions, Gold Standard/Elsevier. Objectives: To describe the utilization and the function of technologies in providing education and ensuring quality of patient care in a student-staffed medication therapy management (MTM) call center. Method: The University of Florida MTM Call Center provides a 2-month advanced pharmacy practice experience for student pharmacists. Each month the Call Center takes 6 new students. The students, initially, receive 3 days of didactic and active learning about the MTM process, and then start their practice experience under the guidance of 3 faculty preceptors and a resident. The Call Center utilizes MTM 360, a web-based decision support and documentation system, to provide structure to the telephonic patient interview and as a platform to train students in conducting a comprehensive medication review, creating a medication action plan and physician fax. A classroom management software and a voice recording system are incorporated into the workflow to enable the preceptors to monitor calls remotely, while letting the students assume responsibility for patient care. The system allows the preceptors to be alerted and provide assistance, in real-time, to students when the need arises during the call. The recorded calls also serve as a quality assessment tool and information retrieval source. Results: The use of technologies in building preceptor-student interaction and assuring quality of care will be presented, along with the highlights on students’ performance and experience of using the technologies in providing MTM. Implications: The result will demonstrate the role that the technologies play in creating a learning environment which fosters students’ autonomy, as practitioners, while providing unobtrusive real-time monitoring from their preceptor.

Training Advanced Pharmacy Practice Experience Students to Serve as Introductory Pharmacy Practice Experience Student Peer Mentors. Nora L. Stelter, Drake University, Kathryn A. Schott, Drake University, Heidi Treml, Drake University. Objectives: To examine the impact of providing peer mentor training to APPE students and the subsequent effect this training has on IPPE student mentees. Method: Phase 1: Third year students were invited to participate in a pre-program assessment, training, and post-program assessment in preparation for peer mentoring during their APPEs as P4 students. Phase 2: P2 and P3 students who worked with the trained APPE student peer mentors during their IPPEs assessed APPE student performance as mentors. Results: Ninety-six P3 students completed the pre-assessment, training and post-assessment. The mean scores for all questions showed significant improvements from pre-assessment to post-assessment (P<0.001). On the pre-test, 75% of students were able to describe the impact they may have on IPPE students by serving as a mentor versus 99% on the post-test. On the peer mentor evaluations (Phase 2), preliminary results showed the APPE mentor “had a positive impact on my experience at the site” with a mean score of 1.65 on a Likert Scale (1=strongly agree and 5= strongly disagree). Additional evaluation data for program outcomes will be presented. Implications: Teaching APPE students the skills to succeed as future preceptors/peer mentors could have potential benefits to the IPPE and APPE students and the college/school. The IPPE and APPE student may have a more positive and rewarding learning experience and may be more likely to become preceptors in
the future thus helping to sustain the growth and meet the needs of experiential education. Peer mentor training may also help relieve preceptor workload.

LIBRARIES/EDUCATIONAL RESOURCES
Completed Research

An Interprofessional Evidence-based Medicine Course for Pharmacy & Medical Students. Heather A. McEwen, Northeast Ohio Medical University, Michelle L. Cudnik, Northeast Ohio Medical University, Beth A. Layton, Northeast Ohio Medical University, Elizabeth H. Young, Northeast Ohio Medical University, Richard J. Kasner, Northeast Ohio Medical University, David D. Allen, Northeast Ohio Medical University. Objectives: To describe a unique course developed at the Northeastern Ohio Universities Colleges of Medicine & Pharmacy (NEUOCOP) that delivers an interprofessional evidence-based medicine course required for both first year pharmacy and medical students. Method: NEUOCOP created an evidence-based medicine course designed to develop student skills in clinical research design, data analysis and information literacy. The course was originally created as a first year pharmacy course, but positive feedback from students and interest from medical faculty led to the inclusion of first year medical students in 2010. It was a module within the longitudinal curriculum for the medical students and a sequenced course for the pharmacy students. The syllabus utilized lectures, in-classroom active learning opportunities and assignments to achieve its educational goals. Results: Medical and pharmacy students attend lectures together and participated in group and individual classroom activities. The class size approached up to 225 students in this course. All students completed an anonymous electronic post-course survey on the course and faculty members. The student generated feedback was invaluable and is utilized to adjust the course content and teaching methods. Implications: We believe that the interprofessional education of healthcare professionals at NEUOCOP will lead to improved teamwork and patient care by interprofessional healthcare teams in the future. NEUOCOP is committed to the interprofessional education of pharmacy and medical students. The evidence-based medicine course is one of the examples of how the university is incorporating interprofessional education into the curriculum.

Describing an Inter-Professional Case Conference on Fibromyalgia: Learning with Other Professionals. Amber V. Buhler, Pacific University Oregon, David G. Fuentes, Roosevelt University, Jennifer Antick, Pacific University Oregon, Shawna Rohner, Pacific University Oregon, Erin Jobst, Pacific University Oregon, Jodi Johnson, Progressive Rehabilitation Associates, Randy Randolf, Pacific University Oregon. Objectives: To describe a progressive case study featuring inter-professional content designed to allow students in clinical research design, data analysis and information literacy. The case features a patient with Fibromyalgia in 6 different encounters with a different professional. Students were sorted into inter-professional teams during the session and engaged in peer-level instruction regarding their different approaches to Fibromyalgia treatment and management. Results: Students (n=26) agreed (A) and strongly agreed (SA) they learned: how other disciplines approach a patient with fibromyalgia (95%); that contributions from different healthcare providers yielded effective approaches to managing patient treatment (92%); and, procedures regarding patient referral to other providers (84%). Implications: This activity can help students in health professions begin to have crucial conversations and lay the foundation for inter-professional practice in the future. Students can learn from one another as faculty members facilitate the process. These results suggest our approach can increase student appreciation for inter-professional exchange and possibly promote future collaboration amongst health professions students. Other schools may use this case study in Fibromyalgia as an effective outlet for inter-professional education.

Effect of Incentives on Summative Course Evaluation Response Rates. Cheri W. Clavier, East Tennessee State University. Objectives: To determine the effect of offering incentives on student response rates for end-of-semester course evaluations. Method: Beginning in fall 2009, instructors were encouraged to offer incentives, such as one or two points on the final exam or a final course grade increase of 0.5%, for the completion of online summative course evaluations. Student grades were increased only if a minimum of 70% of all enrolled students in a course completed the anonymous evaluation. Mean student response rates were compared in courses that offered incentives versus courses that did not offer incentives using independent t-tests. Results: During three semesters from fall 2009 through fall 2010, 20 course coordinators offered incentives for the completion of end-of-semester evaluations whereas 35 did not. Response rates in courses offering incentives ranged from 35.9% to 98.7%, with a median response rate of 76.6% and a mean of 71.2% ± 19.9%. Response rates in courses not offering incentives ranged from 28.6% to 77.5%, with a median response rate of 44.3% and a mean of 49.3 ± 11.8%. Overall, the mean course evaluation response rate was higher in courses that offered incentives (p<0.001). Implications: Courses that offered small incentives had significantly higher student response rates than those that did not. This study did not determine if this occurred because of the incentives themselves or student peer pressure to complete evaluations; nevertheless, the approach had a positive effect on response rates related to summative course evaluations.

Electronic Documentation of Drug Information (DI) Inquiries Using a Web-Based Pharmacy School Data Management System. Miriam C. Purnell, University of Maryland Eastern Shore. Objectives: To determine which methods are being used by DI professionals to document inquiries and to explore the development of a DI interface on a commonly used, commercially available web-based pharmacy school data management system (E*Value™). Method: DI professionals were surveyed to determine their method for documenting inquiries. Surveys were distributed using DI-related list servers and e-mail addresses from a published directory of U.S. DI centers. Questions focused on types of systems used, capabilities of the system, and characteristics of the DI interface. E*Value™ consultants were asked to modify their system interface to track DI inquiries. They were given functionality requirements and were asked to include the content from a paper DI documentation form on the system interface. Results: Thirty-five (35) DI professionals responded to the survey. Approximately 57% of respondents are using a local computer application, 20% are using web-based systems, and 14% are using paper-based systems. Approximately 13% of local computer applications or web-based systems being used are
commercially available, while 87% are custom designed. The intervention tracking feature of E*Value™ was successfully modified to include demographics, inquiry information (e.g. question, response), and other customizable data fields. Available functions include searching and reporting. **Implications:** Although web-based systems offer the potential advantage of remote access, only a few DI centers use such systems. Currently, 85 schools use E*Value™. However, this is the first time that it is being used for tracking DI inquiries. For DI centers affiliated with these schools, using E*Value™ offers a cost-effective and easy to implement system for tracking inquiries.

**Factors Influencing Student Response Rates on Formative Course Evaluations.** Cheri W. Clavier, East Tennessee State University. **Objectives:** To determine the relationship between administration method, professional year, graduation year, semester, and department on student response rates on formative course evaluations. **Method:** From fall 2008 to fall 2010, evaluations were conducted by three different methods: Method A: web-based; Method B: face-to-face during class time using an audience response system (ARS) and discussion; and Method C: face-to-face outside of class time using ARS and discussion. Student response rates were compared using ANOVA and t-tests. **Results:** One-way ANOVA showed a significant difference (p < .001) in the mean response rates for Methods A (M=30.85) and B (M=67.63) and Methods A and C (M=67.63), but not Methods B and C (p = 1.000). ANOVA also showed a significant difference (p < .01) in the means between the classes of 2010 (M=33.44), 2011 (M=36.50), and 2012 (M=50.35) when compared to the classes of 2013 (M=71.00) and 2014 (M=77.00). ANOVA showed no significant difference (p = .308) in response rates by program year (P1 M=55.57; P2 M=50.25; P3 M=45.76). Independent t-tests showed significantly different response rates between fall (M=58.59) and spring (M=35.50) semesters (p < .001) and between courses in pharmaceutical sciences (M=58.62) versus pharmacy practice (M=45.92) departments (p = .035). **Implications:** Higher student response rates were achieved when evaluations were administered face-to-face when compared to an online format. Also, students entering the program in the years since face-to-face administration tend to produce higher response rates. Response rates were not affected by professional program year, but were higher on evaluations during fall semesters and in pharmaceutical sciences courses.

**Information Needs Assessment of Pharmacy Preceptors.** Trish Chatterley, University of Alberta, Cheryl Cox, University of Alberta, Verla Chatis, Regional Drug Information Centre. **Objectives:** The aim of this research is to gather data about preceptors’ access to, use, and teaching of information resources in order to inform the further development of undergraduate pharmacy student placement experiences. **Method:** An electronic survey was distributed to all pharmacists serving as preceptors for the University of Alberta in Edmonton, Alberta, Canada in the Winter and Fall 2010 terms. The survey questions addressed use of and access to information resources, barriers to accessing electronic resources, student/preceptor learning interactions, and the anticipated effects of having additional access to resources. **Results:** A response rate of 35% was achieved. Access to information resources is greater among hospital than community practitioners. 38% of respondents rarely or never teach students about using information resources. 54% are not comfortable teaching search strategy building to students, indicating the students often know more than they do and expressing a desire to be more informed. 86% want to learn more about resources and their use. The majority also want access to additional resources, stating it would greatly improve their practice and have a positive influence on student placement experiences and learning outcomes. **Implications:** Since the survey was conducted, current preceptors have been granted full access to the University library’s collections. Our research has revealed a huge preceptor demand to learn more about information resources and their use, and has also provided direction for preferred delivery strategies. Plans are underway for building learning teams of students, preceptors, librarians and pharmacy faculty to enhance the students’ and preceptors’ learning experiences.

**Library Resources and Services for Preceptors: What the AACP Preceptor Development Taskforce Recommends?** Mariana Lapidus, Massachusetts College of Pharmacy and Health Sciences-Boston, Irena Bond, Massachusetts College of Pharmacy and Health Sciences-Worcester, Christina M. Seeger, University of the Incarnate Word, Denise A. Soltis, Drake University, Nora L. Stelter, Drake University, Maryann Z. Skrabal, Creighton University, Robert L. Talbert, The University of Texas at Austin, Meri Hix, Midwestern University’s Chicago College of Pharmacy, Michelle Katsiyannis, St. Louis College of Pharmacy, Patricia A. Marken, University of Missouri-Kansas City. **Objectives:** *Summarize Preceptor Development Survey findings related to library resources and services (LRS) offered to preceptors across pharmacy schools in the U.S. *Identify areas for improving access to LRS for preceptors *Develop a set of recommendations for LRS preceptor development that could be standardized across member institutions **Method:** The Preceptor Development Taskforce was appointed by the AACP Council of Sections and consisted of members of Experiential Section, Pharmacy Practice Section, and the Library SIG. A 40-item, multiple choice survey on all aspects of preceptor development and training including LRS was designed by the Taskforce and administered in 2010 to 128 experiential administrators 94 of which responded. **Results:** 91 Pharmacy Colleges offer preceptor development programming. 64 of the respondents offer remote access to library collections; most provide walk-in access, reference support, interlibrary loan service, library instruction and research support. 35 schools offer preceptors orientation to library resources, some provide training in literature searching and educational technology instruction as well as drug literature evaluation instruction, reference and research instruction. Among the areas of improvement, 65 administrators emphasized drug literature evaluation instruction, literature searching workshops, access to full-text drug, alternative medicine and evidence-based medicine databases. **Implications:** Based on the Taskforce findings, the standardized recommended LRS for preceptor development and training must include: *Drug literature searching and evaluation instruction *Orientation to information resources including the National Library of Medicine resources and databases and full-text drug/herbal information databases such as Micromedex and Natural Medicines. *Annual database reviews.

**Medical Librarian Involvement in a Sequence of Evidence-based Medicine Courses.** Heather A. McEwen, Northeast Ohio Medical University, Michelle L. Cudnik, Northeast Ohio Medical University, Beth A. Layton, Northeast Ohio Medical University, Elisabeth H. Young, Northeast Ohio Medical University, Richard J. Kasmer, Northeast Ohio Medical University. **Objectives:** To describe the role of a medical librarian in a sequence of evidence-based medicine courses required for first year pharmacy students. **Method:** The Northeastern Ohio Universities Colleges of Medicine & Pharmacy (NEOUCCP) created two evidence-based medicine courses designed to develop and improve the student knowledge-base and skill set in clinical research design, data analysis, information literacy and
Northeast Ohio Medical University, David D. Allen, Ohio Medical University A. Layton, University Ohio Medical University, Rienne Johnson, Richard J. Kasmer, Responding to Copyright Issues through a Specialized Library

Students, support policy enforcement. Rationale for use, and policy enforcement. Groups were compared using Chi square analysis. Results: The student and faculty response rates were 87% (n=208) and 100% (n=23), respectively. A lower proportion of students than faculty were aware of the technology policy (40.6% versus 65.2%, respectively; p=0.026). Sixty-three percent of students reported that they sometimes/frequently use technology for non-class related activities, whereas 91.3% of faculty members believe this occurs. Ninety-six percent of faculty members agreed/strongly agreed improper technology use is disruptive to the student’s own learning compared to only 15.9% of students (p<0.001). Conversely, 30.7% of students acknowledged that their classmate’s use of technology was sometimes/frequently disruptive to their learning. Common reasons for off-task activities included checking email/text messages (76.0%), lack of engagement (58.3%), multitasking (56.7%), and accessing social media sites (32.9%). More faculty members than students agreed/strongly agreed with policy enforcement, specifically by the faculty (65.2% versus 22.8%, respectively; p<0.001) or by students (78.3% versus 31.6%, respectively; p<0.001). Implications: Students’ use of technology for non-class related activities is common in the classroom and faculty members believe it is more disruptive to learning than students do. Faculty members, but not students, support policy enforcement.


Objectives: Copyright is a complex legal and regulatory issue that educational faculty struggle with on a regular basis. The faculty at the Northeastern Ohio Universities Colleges of Medicine & Pharmacy (NEOUCP) sought assistance from library personnel to satisfy the university mandate regarding copyright concerns. Our library took the lead by providing copyright service in February 2010 to address the institution’s copyright requirements. Method: Prior to this service, faculty and administrative staff spent considerable time searching for images and image citations to use in the classroom setting and were often not successful. The specialized reference service audited images in faculty lectures, verifies copyright of images, and suggests alternative images to replace non-permissible images. The library staff also requests permissions from owners and has become skilled in managing this activity. Educational programs about copyright issues were made available through live presentations and the library website. Results: The copyright service has been formalized and is viewed as an essential service for faculty and others involved in instruction and research. A survey is being conducted on users to shape new initiatives in copyright and to ensure our services and resources are aligned with the needs of the institution and regulatory guidelines. Implications: The library took a leadership role in copyright activities. Prior to the launch of this service, the campus community needed assistance and instruction in copyright. The launching and continuation of an organized copyright service focusing on copyright education, image use, and permissions for faculty and researchers addresses a vital need on campus for copyright assistance.

Off-Task Technology Use by Students in the Classroom. Cheri W. Clavier, East Tennessee State University, Michael A. Crouch, East Tennessee State University, Ralph A. Lugo, East Tennessee State University. Objectives: To assess students’ use of technology during classroom time for non-class related activities. Method: The College technology policy states students may not use electronic devices during classroom time for non-class related activities (including communication). The Office of Academic Affairs provided anonymous surveys to students and faculty members to assess awareness of the policy, frequency/severity of off-task use, rationale for use, and policy enforcement. Groups were compared using Chi square analysis. Results: The student and faculty response rates were 87% (n=208) and 100% (n=23), respectively. A lower proportion of students than faculty were aware of the technology policy (40.6% versus 65.2%, respectively; p=0.026). Sixty-three percent of students reported that they sometimes/frequently use technology for non-class related activities, whereas 91.3% of faculty members believe this occurs. Ninety-six percent of faculty members agreed/strongly agreed improper technology use is disruptive to the student’s own learning compared to only 15.9% of students (p<0.001). Conversely, 30.7% of students acknowledged that their classmate’s use of technology was sometimes/frequently disruptive to their learning. Common reasons for off-task activities included checking email/text messages (76.0%), lack of engagement (58.3%), multitasking (56.7%), and accessing social media sites (32.9%). More faculty members than students agreed/strongly agreed with policy enforcement, specifically by the faculty (65.2% versus 22.8%, respectively; p<0.001) or by students (78.3% versus 31.6%, respectively; p<0.001). Implications: Students’ use of technology for non-class related activities is common in the classroom and faculty members believe it is more disruptive to learning than students do. Faculty members, but not students, support policy enforcement.

Responding to Copyright Issues through a Specialized Library Service in a College of Pharmacy. Richard J. Kasmer, Northeast Ohio Medical University, Rienne Johnson, Northeast Ohio Medical University, Amber Repp, Northeast Ohio Medical University, Beth A. Layton, Northeast Ohio Medical University, Heather A. McEwen, Northeast Ohio Medical University, Elisabeth H. Young, Northeast Ohio Medical University, David D. Allen, Northeast Ohio Medical University.

Theoretical Models

ChimeIn: Crowd-Sourced Knowledge Visualizations for Powerful Pedagogy. Jude A. Higdon-Topaz, University of Minnesota, Colin McFadden, University of Minnesota, Don Uden, University of Minnesota, Keri H. Naglosky, University of Minnesota, Rodney A. Carter, University of Minnesota. Objectives: * Explore the pedagogical efficacy of visualizing student-produced knowledge. * Analyze student-sourced knowledge and explore the implications for conceptual and meta-cognitive instructional practice. * Identify the technical and pedagogical challenges to asking text-based polling questions. Method: We integrated a cloud-based, free response student response tool called ChimeIn into our Pharmaceutical Care 2 course in a series of in- and out-of-class assignments, ranging in scope from relatively simple multiple choice-style questions to more open-ended, free response questions. Results: The pedagogical and technical approaches have realized some successes and some challenges. We have been able to use the word clouds to explore and explain ideas with our students in a more active and engaging way than before. However, the cloud-based metaphor used by ChimeIn has pushed our wireless network beyond capacity at points, making collecting poll data in-class difficult or even impossible. We have also found that, particularly for text-based input, the phrasing of the question is critical. Unless questions are phrased very well, “distractor” words may dominate the cloud, crowding out the more interesting content. Implications: Classic clicker technology is ultimately only capable of dealing with multiple choice-style question, which necessarily limits our ability to explore more open-ended, free response styles of student engagement. We believe that adding free-text to the classic clicker-style question, as well as some meaningful aggregation/visualization tools that help instructors and learners make meaning out of the results of student responses, has great implications for active learning pedagogies, both in and out of the classroom.
Work in Progress

A College of Pharmacy Assessment Website to Foster a Culture of Assessment. Rochelle M. Roberts, The University of Texas at Austin, Belinda Lehmkuhle, The University of Texas at Austin. Objectives: This poster will address the development of an assessment website at the University of Texas at Austin (UT) College of Pharmacy to encourage communication among stakeholders regarding assessment activities and ultimately foster a stronger culture of assessment. Method: A more comprehensive assessment website was developed within the college to serve as a central location for information related to programmatic assessment, and content ideas stemmed from a search for assessment information available on websites at other schools/colleges of pharmacy. The search encompassed a total of 36 institutions, including the 29 that had participated in all four AACP Curriculum Quality Surveys during 2010, assuming they were actively conducting assessments and therefore likely to share assessment information in some way. The other seven institutions were included in UT’s peer comparison survey reports provided by AACP. Results: Assessment content from each school/college’s website was documented to determine the 12 major components to include on UT’s assessment website. Out of the 36 schools/colleges, only 10 (28%) had school/college-specific websites for assessment. Of those 10 websites, the 7 that had the most assessment information contained only 4-8 components. Implications: The UT assessment website provides programmatic assessment and accreditation information to engage stakeholders in the entire assessment process. The major components include an explanation of assessment, committee reports, assessment plans, program outcomes, assessment reports, accreditation documentation, assessment timelines, mechanisms to provide feedback to the college, and interesting facts found from assessment data. Continuous monitoring and soliciting feedback from users will be helpful for any changes or improvements to the website.

An On-Campus Community Pharmacy to Support Medication Safety Skills: Use of a Unique Educational Resource. Cathy H. Ficzere, Belmont University, Brice Holder, Belmont University, Jennifer Nguyen, Belmont University, Catherine Williams, Belmont University, Ronda Bryant, Belmont University, Traci Poole, Belmont University. Objectives: To provide an elective in medication safety management with a living laboratory of community pharmacy practice. Method: The two hour elective is mapped to the management or information management concentrations offered within the Belmont University School of Pharmacy curriculum. Upon completion of the course, students will be able to do the following: discuss the human/financial cost of adverse drug events, discuss literature supporting the pharmacist’s role in reducing medication-related problems, assist with Failure Mode and Effect Analysis (FMEA), identify medication safety initiatives, respond to medication errors and adverse events as part of a just culture, propose medication safety initiatives for community pharmacy settings. These course goals support the school’s educational goals of thinking critically and analytically, applying rational/systematic processes to evaluate information, and recognizing consequences of individual decisions in an interdependent world. Students reflected on weekly reading assignments as a pre-requisite for class discussion. The principles outlined in class were applied to the development of a medication safety policy and procedure for the community pharmacy management team. Results: Working with the community pharmacy’s faculty and the course instructor, students conducted an Institute of Safe Medication Practices (ISMP) Community Pharmacy assessment of the new on-campus pharmacy and presented their recommendations for quick fixes, long-term changes, and a formal medication safety policy to the community pharmacy faculty. Results of these assessments will be presented. Implications: This classroom and on-site community pharmacy partnership allowed students to directly apply principles from readings into practice under faculty guidance within an authentic practice environment.

Calculations Across the Curriculum (CAC): A Cross Curricular Learning Model. Beverly Hamilton, Hampton University. Objectives: To demonstrate the need for increased proficiency in pharmaceutical calculations. To introduce the CAC model as a means to enhance student learning with cross curricular instruction and reinforcement. To outline the possible implications of programs such as CAC on student learning and student performance on national licensure exams. Method: CAC incorporates pharmaceutical calculations problems and exercises in all didactic courses based on a monthly calculations theme. Calculations problems of varying degrees of difficulty are posted on Blackboard and a monthly review session is held. Faculty administer calculation questions in various forms of assessment, such as quizzes, exams, and class exercises. This ensures continuous reinforcement and reiteration of calculation concepts each semester. Results: Students were administered a pre-test at the beginning of 2010-2011 school year. The average score was 42%, 38% and 33% for professional year 1, 2 and 3 students, respectively. A post-test will be given in April 2011. There should be an increase in these scores after completion of the CAC program. Data from faculty that administered calculation questions during their classes reported that over 85% of their students attempted the calculations questions with at least 70% answering correctly. These results varied slightly depending on the current theme of the month when the assessment was administered. Implications: As the program continues and evolves, an increase in the School’s NAPLEX passing rate and Area 2 sub-scores is expected, as evidence of improvement in our students’ performance in calculations. This should be a direct reflection on this program’s constant reinforcement of the key concepts.

Combined Use of Online Tutorials and Hands-on Group Exercises in Drug Literature Evaluation Course Content Delivery. Mariana Lapidus, Massachusetts College of Pharmacy and Health Sciences-Boston, Sarah McCord, Massachusetts College of Pharmacy and Health Sciences-Boston, William W. McCloskey, Massachusetts College of Pharmacy and Health Sciences-Boston, Maria D. Kostka-Rokosz, Massachusetts College of Pharmacy and Health Sciences-Boston. Objectives: 1. Describe the innovative teaching methodology used in a required Drug Literature Evaluation course, which involves combined use of instructor-created online tutorials available through Blackboard and group hands-on exercises. 2. Statistically assess the effectiveness of this approach to compare it with traditional didactic teaching techniques. 3. Identify continuing challenges, including curriculum changes, increasing class size, and a strong need for hands-on experience as the main reasons for developing the new approach. Method: The benefit of combined use of online prerecorded tutorials in addition to engaging students in hands-on in-class group exercises will be measured based on assignment grades earned by the pharmacy students enrolled in the Drug Literature Evaluation course in 2008 and after the new class design and delivery methods were implemented in 2009 and 2010. In addition, students’ evaluations of the course will be studied and analyzed in order to ascertain their perceptions of both the new online tutorials as well as in-class active learning activities including using case studies to practice search techniques. Results: TBD Implications: Compared with traditional didactic teaching methods, the innovative approach used to deliver the Drug Literature Evaluation Course content by a collaborative team of...
library and pharmacy faculty seems to be much more effective in helping pharmacy students to better learn and apply drug information skills. Combining two teaching techniques could be successfully utilized within other pharmacy schools across the country to optimize students’ learning experience and satisfaction in similar courses.

Comparison of Achievement Goal Orientation and Motivation to Achieve on the PCOA Administered as Low-Stakes. Rhonda A. Waskiewicz, Wilkes University. Objectives: This study builds on previous research that minimized the impact of low motivation effort on PCOA test performance through incentivizing and statistical manipulation. This study seeks to expand understanding of performance motivation by 1. Measuring and identifying P-3 students’ intrinsic motivation to achieve in the pharmacy major based on Achievement Goal Orientation research 2. Comparing P-3 students’ intrinsic motivation to their motivation to achieve on the PCOA when administered as a low-stakes test of content knowledge 3. Determining the impact of motivation-type on assessment of student learning outcomes Method: Entire P-3 class (66 students) completed the following: 1. At the beginning of the spring semester: Attitude Toward Learning and Performance Scale that measures Achievement Goal Orientation in the major 2. Immediately following the completion of the PCOA: The Student Opinion Scale that measures Motivation Effort on the PCOA that was administered as low-stakes Data will be analyzed to determine if a significant relationship exists between 1. achievement goal orientation and motivation effort on the PCOA 2. motivation effort (unfiltered and filtered) and performance on the PCOA 3. achievement goal orientation and performance on the PCOA Results: Data are in the process of being collected and analyzed. Implications: It is expected that improved understanding of what motivates performance in different situations will: 1. Advance teaching and learning methodologies 2. Assist program’s with assessment of student learning outcomes 3. Improve curricular decisions

Comparison of Assessment Methods in a Problem-based Learning (PBL) Pharmacotherapy Course Sequence. Kristen L. Helms, Auburn University, Pamela L. Stamm, Auburn University, Sharon McDonough, Auburn University. Objectives: * Compare and contrast student success in a problem-based learning (PBL) course utilizing multiple choice exam questions and a course using both multiple choice and written answer exam questions * Compare and contrast the range of content and level of Bloom’s taxonomy achieved in question items * To assess the feasibility of offering written examinations in a PBL course Method: Students’ assessment results in two consecutive years of a PBL course sequence are compared. Assessment methods in the first year of the course study were limited to multiple choice items. In the consecutive year, 50% of items were converted by item writers to short answer/written questions. Analysis will include comparisons of student grade distributions, level of Bloom’s taxonomy achieved in question items, and number of course and disease state objectives achieved in each assessment. Efficacy of the each test item will be compared using item statistics. Feasibility of assessment methods will be determined using grader feedback and log of time spent in grading. Results: In progress Implications: The success of PBL in medical curricula centers on the students’ abilities to solve problems and utilize resources. Assessment of these skills for individual students is often difficult using the traditional and efficient multiple choice examination format. Written-answer examinations may offer a better assessment methodology with the potential for diminished grading efficiency. This research will determine whether written examinations better meet the needs of the PBL learning style and whether continuation of this assessment style is feasible.

Drug Information Resources in the Palm of Your Hand: Building a Smartphone-Compatible Web Resources Portal. B.C. Childress, Sullivan University, Nathan Ragland, Sullivan University. Objectives: The intent of this project is to create a focused series of custom web portals to deliver Drug Information content and resources optimized for mobile technology devices to faculty and students at the college of pharmacy. Method: Access to drug information and the biomedical literature is a critical component of pharmacy education. However, access to these sources can be difficult when utilizing mobile or handheld technology devices. This project utilized a drug information specialist at the college of pharmacy in collaboration with the university’s health sciences online resource librarian in the creation of web pages designed to render correctly on the most popular 3G-equipped smartphones. The current online resources available at the university’s Drug Information Center are being vetted for mobile utility, ranked by usage frequency, evaluated for mobile-friendliness, and placed on the mobile web portals. The intended outcomes of this project are to provide 24/7 resource access to smartphone-equipped pharmacy faculty and students, regardless of their physical location, as well as optimize that access for utilization on mobile devices. Results: The creation and rollout of these mobile web pages is in process, and all outcomes and results will be presented at the conference. Implications: This project will assist with the university’s current mission to reduce pharmacists’ dependence on the computer, allowing them to retain mobility and operate on the move. It will also facilitate access to allow students and faculty to retrieve the needed information quickly and with greater ease of access than the original web resources portal.

E-books in the Classroom: a Survey of Students and Faculty at a School of Pharmacy. David C. Phillips, University of Missouri-Kansas City, Eve C. Elias, University of Missouri-Kansas City, Melissa Luechtefeld, University of Missouri Kansas City. Objectives: In recent years, there has been a substantial increase in digital publishing, especially in novels, non-fiction and even textbooks. As more textbooks become available in either downloadable or online format, their popularity is increasing due to the portability and searchable qualities they provide. The primary objective of this study is to identify the availability and interest in the adoption of e-textbooks by school of pharmacy students and faculty. Method: An initial identification of all required and suggested textbooks used within UMKC School of Pharmacy required courses will be completed through review of syllabi and/or contacting course coordinators. Two anonymous surveys created through Survey Monkey are to be administered to both students and faculty via a link in an email sent by the principal investigator asking for voluntary participation. Results: Data collection is ongoing. Results and conclusions will be presented at the American Association of Colleges of Pharmacy Annual Meeting 2011. Implications: Acceptance and adoption of e-textbooks by students and faculty has the potential to not only improve the utilization of the references without the concerns of the physical weight and volume of traditional texts, but also cut costs for students and schools. Other benefits include publishers’ awareness of the possibility of a growing e-textbook market, as well as other schools of pharmacy gaining access to valuable student and faculty opinions. In addition, utilizing 21st century technology in the classroom could be supported by the outcomes of this study.

Enhancing Pharmacy Students’ Knowledge and Confidence in Evaluating Internet Resources by Applying Health-on-the-Net (HON) Principles. Gregory W. Smith, The University of Louisiana at Monroe, Scott A. Baggary, The University of Louisiana at Monroe. Objectives: The purpose of this study was to determine baseline knowledge and confidence of evaluating internet health-related resources and
to determine the impact of an exercise designed to enhance students’ knowledge and confidence with regard to evaluating these resources. **Method:** First (P1) year pharmacy students were assigned a disease state and were asked to locate three health-related internet resources that would provide information pertaining to the disease. Each student was asked to determine which resource provided the highest quality information. The students then listed the four most important characteristics of a high quality health-related resource based solely on their baseline experience and opinion. Subsequently, each student reviewed a tutorial of the HON (Health on the Net) principles prior to re-evaluating his/her “best” website. Based on this new knowledge, students again listed the four most important characteristics used to determine the quality level of a health-related resource. The students were surveyed before and after the exercise to determine changes in knowledge and confidence. The differences in knowledge scores were compared using a t-test. The differences in pre- and post-exercise confidence levels for individual items were compared using a Wilcoxon Signed-Rank test. The pre- and post-composite scores of all confidence items were compared using a Mann-Whitney U test. **Results:** Research in progress. Results are pending. **Implications:** The HON principles provide an effective method to evaluate the quality of information from internet-based health resources. Knowledge of and confidence in applying these principles will enable student pharmacists to provide accurate information to patients.

**Exploration of Pharmacy Student Use of Mobile Technologies.** Trish Chatterley, University of Alberta, Lisa Guirguis, University of Alberta, Christina Hwang, University of Alberta Libraries. **Objectives:** This research was designed to gain insight into pharmacy students’ use of mobile learning technologies and student desire to use their personal devices for course related activities. **Method:** Pharmacy students in the first three years of the BSc Pharm program at the University of Alberta were asked to complete a three page written survey in class time. Pharmacy instructors were not present during survey administration. The survey asked about ownership of mobile devices, typical use patterns, and desire for integration of mobile device use into pharmacy course related activities. Descriptive analysis will be used to characterize use of mobile learning. SPSS will be used to calculate ANOVA and chi-square as appropriate to determine if willingness to use personal devices varies significantly by year of school, device ownership, or current device use. **Results:** Survey response rate was 92% and analysis will be performed on a sample of 354 students (year 1 = 122, year 2 = 123, and year 3 = 109 pharmacy students). Data analysis will be completed in Spring 2011. **Implications:** Mobile learning provides flexibility and convenience, allowing students access to course materials anytime and anywhere. It has the potential to enhance student engagement, improve learning outcomes, and encourage interactions among students and instructors. These results will characterize pharmacy students’ use of mobile learning technologies and preferences for future use in the classroom. Results will inform curriculum development and course delivery with the aim to engage and interact with millennial learners.

**Impact of Utilizing Web 2.0/3.0 for Quality Assurance Program on Drug Information Education and Practice.** Miriam A. Ansong, Sullivan University, Hieu T. Tran, Sullivan University, Sushain Maraj, Sullivan University, Chad Burks, Sullivan University, Jenny Park, Sullivan University. **Objectives:** To evaluate the impact and perceptions of DI specialists, APPE students, and clinical pharmacists on using social interactive DI Quality Assurance Blog. **Method:** Drug Information centers (DICs) are charged to implement peer reviewed quality assurance (QA) programs for continuous improvement for their services. This can easily be achieved by fully staffed DICs however, it can be challenging for centers staffed by one person. A comprehensive research conducted in secondary resources and reputable internet sites provided limited information on the topic. Last year, the QA blog was created to accomplish this aim and was presented at the American Association of Colleges of Pharmacy (AACP)’s Conference. Afterwards, a pilot group of DI specialists, clinical pharmacists, and Advanced Pharmacy Practice Experience (APPE) students have been invited to the blog for participation in the peer-assessment of completed drug information requests. All demographic information on DI requests is removed and posted on the blog by pharmacists. Participants are allowed a month to review and comment on the post. Mobile technology can be used to complete the review. Periodic assessment using a five-question survey will be sent to participants via Zoomerang software to measure the impact and perception of this program on pharmacy education and practice. Program details and the assessment will be presented at the Conference. **Results:** This online social interactive QA program is currently in session and the assessment will be presented at the Conference. **Implications:** This program will maximize the flexibility of peer assessment of clinical requests, and enhance students’ knowledge in drug information through participation.

**Implementation of a Multi-campus Academic Training Program for Pharmacy Residents.** Rochelle M. Roberts, The University of Texas at Austin, Debra Lopez, The University of Texas at Austin, Theresa Gerst, The University of Texas at Austin, William J. McIntyre, The University of Texas at Austin, Sherrie Bendele, The University of Texas at Austin. **Objectives:** The University of Texas at Austin College of Pharmacy has 28 affiliated residency programs with 47 post-doctoral residents across the state in five locations. The college piloted an academic training program to prepare residents for teaching in the college and for academic careers in the future. **Method:** The program consisted of a one and a half day workshop with 12 sessions, broadcast via interactive television in Austin, El Paso, and San Antonio (residents from Temple and the Rio Grande Valley traveled to either Austin or San Antonio). The Tools for Teachers session was site-specific to inform residents about resources available locally. Following the workshop, residents must complete five core activities during the residency program, supervised by a mentor chosen from a list provided by the college. These activities still allow for varying teaching experiences at different sites. **Results:** Forty residents participated in the workshop, and twenty-three residents representing each site completed a post-workshop survey. Eighteen respondents (78%) reported this as their first formal academic training. Twenty-one respondents (91%) gave positive ratings on the interactive broadcast. Overall, survey participants overwhelmingly indicated, through ratings and comments, that sessions were helpful with their planned career paths. **Implications:** Ongoing assessment for the remainder of the program will help determine improvements for the workshop and teaching activities, but feedback so far has indicated that a collaborative academic training program can accommodate residency programs at different sites. The College has been approached by non-affiliated residency programs to expand the offering to other cities during the coming year.

**Print Versus Electronic: Are books Becoming a Thing of the Past?** Morgan L. Sperry, University of Missouri-Kansas City, Heather A. Pace, University of Missouri-Kansas City. **Objectives:** The objectives of the study are to: discuss the transition of traditional Drug Information resources from print to electronic, measure current trends in preference and utilization of resources, and identify
The latest educational trends associated with Drug Information resources. The hypothesis is that Drug Information Centers and faculty are moving away from print resources as an increasing number of traditional print resources have become available electronically but Drug Information education has not followed this movement. Method: A web based survey will be administered to all US Drug Information Centers and School of Pharmacy faculty to gauge personal preferences for print versus electronic Drug Information resources and utilization in practice. Additionally, education regarding print and electronic resources will be measured. Results: Preliminary data suggests an increasing number of drug information references traditionally available in print format have become available via electronic means. Current trends suggest a change in practice moving toward the increased use of electronic resources and decreased use of print media suggesting a potential extinction of books. Implications: This study aims to investigate the shift in drug information references used and the impact that the increasing availability of electronic resources has on the use of “good old fashioned” print resources. This change in times suggests a need to change the focus of Drug Information education to prepare future practitioners for the environment they will be practicing; thus potentially changing the face of Drug Information Centers and practice as we traditionally know it.

Student Peer Review: Help or Hindrance? Bernie R. Olin, Auburn University. Objectives: To measure the outcome, in the form of a final grade, of a student literature research paper with and without a student peer review feedback process. Method: P1 students in a drug literature class are required to construct a drug information question based on their experiences in a patient care course. This question is approved by their instructor prior to beginning research. The student then answers the question via a systematic approach and produces a formal written response including the question, background information, response and references. These formal responses are graded based on an established rubric based on 100 points. With the previous year’s students serving as control, the process is the same for the current year with the exception that a classmate of their choice peer review their document before submission. The peer reviewer will follow the same rubric and the student will modify their response before turning in the final document. The peer reviewer’s score and comments will be submitted with the student’s final paper. Results: The average score from the previous year’s assignment will be compared to the average score of this year’s class assignment to detect any difference that should be attributable to the peer review function. Implications: If the average student score is higher with the peer review process, it will underscore the value of the peer review process to students at an early stage in their pharmacy career. In either event, the exercise should strengthen writing skills for the writer and the peer reviewer.

Students’ Confidence in Their Abilities to Achieve APPE Hospital Pharmacy Practice Competencies. Laura A. Morgan, Virginia Commonwealth University, Veronica P. Shuford, Virginia Commonwealth University. Objectives: To measure changes in third-year pharmacy students’ confidence in their ability to achieve competencies evaluated in APPE hospital pharmacy practice. Method: At the beginning of the first semester of the third pharmacy school year, students completed a hospital pharmacy practice confidence survey. This survey was adapted from the evaluation form used to evaluate students in the advanced pharmacy practice experiences for hospital pharmacy practice. Using the results of this survey, the PHAR640: Foundations of Pharmacy Practice V course were developed to target specific weakness identified. After completing the activities in this course the same confidence survey was administered at the end of the semester. Results: A total of 116 students responded to the initial survey (response rate: 97.5%). An area of weakness was defined as >=20% of students identifying their level of confidence as “not at all confident.” Seven competencies were identified as areas of weakness: 1) disease state knowledge, 2) clinical pharmacology, 3) patient pharmacotherapy assessment, 4) pharmacy care plan, 5) acquisition, 6) management, and 7) pharmaceutical product knowledge. The final survey was completed by 107 students (response rate: 90%). Confidence significantly improved in all previously identified areas of weakness. Implications: Students’ confidence in their abilities to achieve APPE hospital pharmacy practice competencies improved over the course of the semester. Activities targeted to address identified areas of weakness may have contributed to this improvement.

The Impact of Deliberate Problem-Solving Feedback on Students’ Problem Solving Skill Development. Melissa S. Medina, The University of Oklahoma, Susan E. Conway, The University of Oklahoma, Tamra S. Davis, The University of Oklahoma, Holly Herrig, The University of Oklahoma, Ryan Webb, The University of Oklahoma, Ann E. Lloyd, The University of Oklahoma, Todd Marcy, The University of Oklahoma, Toni Ripley, The University of Oklahoma, Jeremy Johnson, The University of Oklahoma. Objectives: At baseline and follow-up: 1. Evaluate the effect of deliberate problem-solving (PS) feedback on students’ ability to prioritize, organize and defend the best and alternative options using evidence (medical literature and patient data) on team-based learning (TBL) cases. 2. Compare 3 groups’ PS skill improvement. 3. Compare students’ perceptions of their PS ability within and among groups of students using TBL. 4. Compare faculty and student PS scores. Method: While TBL helps students apply content to patient-related clinical scenarios, its effect on students’ PS skills without intentional discussion of PS steps and specific PS feedback is unclear. Therefore, this study design uses 3 groups to measure the amount and type of feedback needed to make an improvement in students’ PS skills using TBL over 8 week timeframes. Group 1 received weekly verbal and written feedback about their PS skills via a PS rubric, while group 2 received only written feedback weekly via the PS rubric and group 3 received no verbal or written feedback. Student scores on the PS rubric and students’ perceived PS confidence measured by a PS survey were compared at baseline and follow-up. Results: It is hypothesized that group 1 (weekly written/verbal feedback) will have a statistically significant improvement on student TBL responses and PS confidence within the group and vs. groups 2 and 3. Implications: These results will provide guidance on the amount and type of feedback needed to advance students’ problem solving skills, which could impact how TBL is delivered in the curriculum.

The Impact of a Critical Thinking Course on the Critical Thinking Skills of Pharmacy Students. Angela S. Clauson, Palm Beach Atlantic University, Jamie L. Fairclough, Palm Beach Atlantic University, Daniel L. Brown, Palm Beach Atlantic University. Objectives: The intent of this project is to determine the impact a critical thinking course taken during the first year of pharmacy school will have on the critical thinking skills of pharmacy students. We will also assess the perception of the pharmacy students on the usefulness of such course. Method: During the first session of the critical thinking course, we will administer the Health Science Reasoning Test (HSRT). The HSRT is a test that is used to assess the five different components of critical thinking: analysis, evaluation, inference, and inductive and deductive reasoning. The students will be given their results and will be required to write a paper reflecting upon these results. At the conclusion of the course, we will administer the HSRT.
again. We will then compare the HSRT results before and at the conclusion of the course. We will also administer a survey to the first and second year pharmacy students in order to evaluate student perceptions regarding the effectiveness of the course in preparing them for future courses. Results: At the conclusion of our study in May, we will be able to determine whether a course focusing on improving critical thinking skills is effective based on the scores from the HSRT and student perceptions upon completion of the course. Implications: Other schools of pharmacy will be able to use our results to evaluate the utility of incorporating a similar course into their curriculum.

Emerging Pedagogies of Student Technologies (ePOST): Do iPads Offer Benefits for Learning and Administrative Activities? Jude A. Higdon-Topaz, University of Minnesota. Objectives: * To evaluate the efficacy for student learning activities, note-taking, annotation, and reading online textbooks, of mobile devices such as the iPad and the Entourage eDGe. * To evaluate the administrative benefit to students, if any, of using mobile devices such as iPads and Entourage eDGes. Method: We procured three Apple iPads and three Entourage eDGes and distributed them among six of our PharmD students to evaluate their efficacy for use as curricular aids, in and out of the classroom. Participants were required to fill out a weekly evaluation form with their results. Results: Our preliminary findings indicate that both mobile devices that we evaluated were found wanting in several key regards, specifically for in-class note-taking and slide annotation. The iPad was deemed more useful than the eDGe for accessing course web sites and for basic web browsing, while the eDGe was found to be more useful as an eBook reader for online textbooks. Interestingly, while the students with both devices initially reported having difficulty with file management, those issues seemed to go away over time as the learners got more familiar with the “cloud-based metaphor” of the device. Implications: Our findings lead us to believe that the iPad and Entourage eDGe are not ready to be considered as substitutes for current curricular practices such as note taking and slide annotation, but may prove useful for administrative activities and as sophisticated eBook readers.

Pharmaceutics

Completed Research

An Integrated Laboratory Approach to Drug Dissolution: Focus on Drug Formulation and Release. Wendell S. Akers, Lipscomb University, Susan L. Mercer, Lipscomb University. Objectives: A drug dissolution experiment was developed to reemphasize fundamental concepts in acid/base chemistry, drug solubility, and drug dissolution delivered by traditional lecture-based courses within the first year of the professional pharmacy program. The goal of this experiment was to require students to apply their knowledge and comprehension about these fundamental concepts and demonstrate the key processes that impact drug release from solid dosage forms by performing, analyzing, and evaluating a drug dissolution experiment. Method: Utilizing a six vessel dissolution apparatus, students in groups of four (n=18 groups) evaluated different dissolution release profiles of aspirin from immediate release and enteric coated tablets by simulating the acidic and alkaline environment of the stomach and small intestine, respectively. Student performance was assessed by the quality of their data, ability to summarize and interpret data in written and graphical formats, and completed worksheets designed to predict aspirin’s physicochemical properties (functional groups, pKa, LogP, solubility) and their potential impact on drug stability, dissolution, and absorption. Results: Students developed a greater understanding of the regulatory requirements for immediate release and enteric coated aspirin products supported by drug dissolution testing, the specific use and effect of drug excipients and enteric coating technologies used in aspirin products to alter drug release from solid dosage forms, and the solubility or stability of aspirin in aqueous media under a variety of pH conditions. Implications: This integrated laboratory exercise was an efficient, cost effective teaching method that enhanced student learning in the practical aspects of drug formulation and release from solid dosage forms.

Evaluation and Comparison of Novel THC Prodrugs ELI-UN1-107-3 and ELI-XIX-77-1. Michael A. Repka, The University of Mississippi, Soumyajit Majumdar, The University of Mississippi, Noorullah N. Mohammed, The University of Mississippi, Ziyaur Rahman, FDA, Waseem Gul, ElSohly Laboratories, Inc., Mahmoud A. ElSohly, ElSohly Laboratories, Inc. Objectives: Tetrahydrocannabinol (THC) is the main active constituent of Cannabis sativa, which has demonstrated valuable medicinal uses. The primary issues with THC are poor water solubility, permeability and stability. In this study, physicochemical characteristics, chemical and thermal stability of a novel class of THC prodrugs ELI-UN1-107-3 (THC-Val) was evaluated and compared with ELI-XIX-77-1 (THC-HS), another class of THC prodrugs. Method: pH dependent solubility studies were performed in various buffers, with pH ranging from 1.2 to 10.0, and in water at 25°C. Chemical stability was assessed at pH 2, 5, 7, 9 and in water at 25°C. Thermal stability was determined by formulating the prodrugs into hot-melt casted bio-adhesive patches using polyethylene oxide matrices. Results: Prodrugs studied demonstrated pH dependent solubility. The highest solubility, 153.66 μg/ml was observed at pH 2.0 for ELI-UN1-107-3 and 84.90 μg/ml for ELI-XIX-77-1 at pH 10. ELI-UN1-107-3 was most stable at pH 12.0 while ELI-XIX-77-1 exhibited greatest stability in the pH range of 4-5, which was evident from their degradation constants. The content of ELI-UN1-107-3 and ELI-XIX-77-1 in the patch after processing was 91.8% and 39.5% respectively. The calculated mLogP values of ELI-UN1-107-3 and ELI-XIX-77-1 were 2.85 and 3.72, respectively. Corresponding pKa values of the prodrugs were 7.87 and 4.27, respectively. Implications: Aqueous solubility of the novel THC prodrugs was demonstrated to be significantly higher than the parent drug THC. These classes of prodrugs demonstrate potential for formulation development and warrants further investigation.

Evaluation of Student Performance Using Multiple Choice and Open-Ended Examination Questions in a Pharmacy Calculations Course. Christine R. Birnie, St. John Fisher College, Parag Budukh, St. John Fisher College. Objectives: To evaluate student performance in courses, instructors have used various types of question item formats in their examinations. The objective of this study was to compare the performance of pharmacy students completing a Pharmacy Calculations course which employed either open-ended or multiple choice examination questions. Method: A required Pharmacy Calculations course was taught to first year pharmacy students in two sequential years. The course content was essentially identical in both offerings. In year 1, four examinations using open-ended questions were administered to the students (n=75) with partial credit awarded. In year 2, four multiple-choice examinations, employing no means for partial credit were administered (n=78). The averages for each examination and overall course average for the two offerings were compared using t-tests. Both courses were also assessed through an on-line course evaluation system using E-Value. Results: Over a two
Impact of Team-based Learning in a Foundational Pharmacokinetics Course. Adam M. Persky, *University of North Carolina at Chapel Hill*. **Objectives**: The objective of this pilot study was to implement team-based learning (TBL) in a foundational pharmacokinetics course and characterize its effects. **Method**: The course was arranged into five modules based on the TBL format. Each module started with pre-class preparation using an e-book or web-based material. Class preparation was ensured with a readiness assessment process which consisted of individual and team quizzes. In class activities consisted of multiple choice cases. Each module was one to three weeks in duration. Examinations consisted of answer-untill-correct, multiple choice, case focused questions aimed at higher levels of learning. Surveys were given pre- and post-course on professionalism and attitudes of team learning. **Results**: Examination grades focused at the application/analysis level were comparable between the current format and the previous year when a small group format was used. There was a significant increase in scores during the TBL year on synthesis/evaluation questions on examinations when compared to the previous year. Based on survey results, overall professionalism increased over the course of the semester particularly in altruism and honesty. Various sub-component measures of attitudes of team learning significantly increased over time although there was no change in major sub-scales. End of semester course evaluations showed improvements in active engagement and in various areas of skill development (e.g., verbal skills, team skills, working with diversity). **Implications**: TBL format can be used successfully in a foundational pharmacokinetics course resulting in potential increases in higher levels of learning, team learning skills, and professionalism.

Lecture Podcasts—Supplement or Replacement for In-Class Lectures in Traditional Classroom Courses? Parag Budukh, *St. John Fisher College*, Christine R. Birnie, *St. John Fisher College*. **Objectives**: Podcasts are well accepted by students in online and hybrid course environments as teaching tools. However, the students in twenty-first century traditional classrooms are equally adept with the use of technology in learning. The objective of this study is to examine student responses to the use of lecture podcasts in traditional classroom based pharmaceutical science courses. **Method**: Two lecture podcasts were prepared and posted online via BlackboardTM course management system, as part of a required pharmaceutical science course sequence. The podcasts covered two topics in pharmaceutics - one being introductory in nature (Pharmaceutical Compounding) and the other being more focused (Partition Phenomena). The podcasts were used as replacements to the in-class lectures for these topics. Following each podcast, a survey was administered to seek student feedback regarding the utility of the podcasts and their preferences for future use in the same courses. **Results**: The survey indicated that 42.3% students never watched the podcasts. Among those who watched the podcasts, the majority (97.6%) thought that the podcasts were effective learning tools. In the class viewing the podcast for an introductory lecture, the majority (68%) preferred podcasts as a replacement to in-class lectures, while the groups viewing the podcast for a more complex lecture preferred podcasts as a supplement to in-class lectures (63.5%). **Implications**: Students thought the podcasts can be valuable tools to aid in their learning. The nature of the material covered in the podcasts may have influenced the preference regarding the use of lecture podcasts as a supplement or replacement for in-class lectures.

Methodologies and Strategies for Teaching a Course on Basic Pharmaceutics. Seher A. Khan, *Lake Erie College of Osteopathic Medicine School of Pharmacy*, Sonam Singh, *Creighton University*. **Objectives**: The current study examined how a course on basic pharmaceutics/ physicochemical basis of drug action is taught in US pharmacy schools with a focus on different methodologies and strategies utilized to enhance student learning. **Method**: Pharmaceutics instructors at selected US Schools of Pharmacy were invited electronically to complete an anonymous 11-item online survey utilizing the BlueQ software (Vovici Corporation). Follow-up emails were sent twice over a period of two weeks for those who did not participate initially. **Results**: The survey resulted in 14 responses (93%). Our data indicate that traditional classroom lectures remain the main approach of instruction (100%). Other instructional strategies that have been incorporated include: integrated case studies (55%), group discussion (58%), homework assignments (67%) and use of web-based materials (58%). Although a majority of the instructors (83%) required a textbook in the course, use of outside textbook reading such as journal articles was found to be less (33%). The instructors also provided us with the textbook details used in their courses. Of the pharmacy programs surveyed, 86% schools have an independent course in basic pharmaceutics. Credit hour assigned to the course varied between 3-6 hours. **Implications**: Information obtained from this study may help others to improve existing courses in pharmaceutics. Data from this preliminary study will be further analyzed to develop a follow-up
survey study where all US pharmacy schools will be invited to participate.

The Design of A Sterile Product Laboratory Module as Preparation for an Institutional IPPE Course. Fang Zhao, St. John Fisher College, Christine R. Birnie, St. John Fisher College, Anthony Corigliano, St. John Fisher College, Susan Hughes, University of Rochester, Medical Center, John Loughner, University of Rochester, Medical Center, Stephen Valentine, University of Rochester, Medical Center. Objectives: To develop a pharmacutes laboratory module on compounded sterile products for the second year pharmacy students as preparation for an institutional pharmacy experiential course. Method: A 5-week lab module was designed and implemented as part of the Pharmaceutics Lab Course to provide training in the basic skills of sterile product compounding. The module included techniques in the handling of sterile products, aseptic techniques, medium risk products, and hazardous products. A practical exam was given at the end of this module to ensure student competency. Upon completion of the lab module, students enrolled in a required 4-week institutional pharmacy experiential course (IPPE-2), where students were required to compound a minimum of 10 sterile products. Students were then asked to participate in a survey assessing the effectiveness and relevance of the lab module as preparation for their IPPE-2. Results: The sterile product lab module was offered in the spring semester with 75 students enrolled. All students passed the sterile product lab module and continued onto the IPPE-2 course during the following summer. The student survey indicated that the students felt well prepared for the IPPE-2 and that the preceptors were satisfied with their prior training in sterile product compounding. The average scores ranged from 4.8 - 6.5 (scale of 1-7) for the various products addressed in the lab module. Implications: The 5-week sterile product lab module progressively prepares the students with the basic skills and knowledge in compounding sterile products. This preparedness allows the students to transition smoothly into the subsequent institutional pharmacy experiential course.

The Use of Technology in a Newly Designed Specialty Practice Teaching Laboratory. Deborah L. Elder, The University of Georgia. Objectives: To improve the compounding skills of pharmacy students using technology and a newly designed specialty practice (compounding) teaching laboratory Method: A 2,400 sq. ft. 40-seat multifunctional, 10 alcove, 40 workstation technology enriched specialty practice laboratory was designed for teaching pharmacy compounding. Each alcove contains 4 workstations equipped with compounding equipment and supplies (prescription balances, graduates, mortars & pestles, ointment slabs, etc.), internet access, and video-capture cameras. A monitoring center and intercom system facilitates instructor/student interactions in separate alcoves. An over-head video-capture system allows live streaming of lab demonstrations into remote lecture halls. Objective based performance activities are used to develop and/or strengthen calculating, weighing, measuring, labeling, packaging, record-keeping, outpatient dispensing and compounding skills. A 10 question 5 point Likert scale (5 strongly agree: 1 strongly disagree) survey was used to capture student perception of the teaching laboratory for preparing, packaging and mock dispensing of non-sterile extemporaneous products. Results: Students found the use of technology created a positive learning environment. Overall, the majority of students agreed or strongly agreed the design (91%), workspace (89%), environment (100%), supplies/equipment (92%), performance activities (76%) and the available technology (96%) enhanced the development of compounding skills. Implications: Technology proved to be an effective tool for teaching compounding skills. Advances in technology can be used to create a safe, realistic environment where students can acquire the skills and confidence to be competent and effective pharmacy practitioners in today’s technology driven world.

Theoretical Models

Bottoms Up: Curricular Development Using Backward Design. Diane F. Pacitti, Saint Joseph College, Rajesh Vadlapatla, Saint Joseph College. Objectives: Development of a novel modified block-style curriculum using backward design. Method: In the backward design model, the curriculum is designed by beginning with the end result in mind. In our program, curricular planning began with the identification of specific learning goals and assessment outcomes. These outcomes were mapped to school wide ability based outcomes (ABOs), as well as other national and professional organization standards. The next step using the backward curricular design method is to determine appropriate assessment techniques: a vital component to provide evidence of student progress and content mastery of the learning outcomes. Student understanding of course content is closely monitored during the progression of a course. Assessments may include daily formative quizzes and biweekly summative evaluation examinations, as well as informal assessments. The final (and critical) step when using backward design is the preparation of meaningful learning experiences and instruction strategies designed to optimize student understanding and course content mastery. Examples include lesson plans, small group learning and teaching activities, case studies, problem sets and lectures. Results: A curricular model is only deemed successful with evidence of student mastery of course material. Our assessment plan will serve as an indicator with which to evaluate curricular effectiveness, as well as act as continuous quality improvement instrument for further curricular modifications as the curriculum rolls out. Implications: We are confident that by implementing this curricular development method our students will not only achieve mastery of curricular content, but also develop critical thinking skills, invaluable tools for life-long learning.

Work in Progress

Determining the Presence and Effect of MRP4 Efflux Pumps in Human and Rabbit Cornea. Sindhuira Motaparthi, Howard University. Objectives: Multidrug Resistance Associated Proteins (MRP’s), P-glycoprotein (Pgp) and Breast Cancer Resistance Protein (BCRP) are some of the recent discovered efflux pumps on the human cornea. The primary purpose of this study is to show the presence of MRP4 efflux pumps in the human and rabbit corneal epithelial cells. Method: Transfected human corneal epithelial cells (SV40-HCEC) and Statens Seruminstitut rabbit corneal epithelial cells (SIRC) purchased from ATCC (Manassas VA) are used for the experiments. Both the cell lines were grown at 370c, 5% CO2, in a culture medium containing Dulbecco’s modified Eagle’s medium (DMEM) supplemented with 10% fetal bovine serum, 5% pen-strep (penicillin and streptomycin), 2% gentamycin. RT-PCR of the HCEC and SIRC was done to see any signs of MRP4 efflux pump. Both the cell lines were grown for mRNA extraction. RNA was extracted and purified; RT-PCR is performed using standard protocol. The forward and reverse primers for MRP4 were designed using an online database. RT-PCR products were analyzed by electrophoresis on 2% agarose gel. Results: The following figure shows the expression of MRP4 in both human and rabbit corneal epithelial cells. The expression in rabbit corneal epithelia cells is faint, the reason being the use of primers designed for human corneal epithelial cells. Implications: By the expression of MRP4 efflux pumps in human and rabbit corneal epithelial cells presents an opportunity to further investigate their role
in Ocular drug delivery and in modifying the ocular drug delivery methods.

**HPLC Validation and In Vitro PK Analysis of HIV Iron Chelator Permeability Evaluating Oral GI Absorption.** Pradeep K. Karla, Howard University, Zufan K. Debebe, Howard University, Meseret Ashenaft, Research Associate, Walton Byrnes, Research Associate, Tatiana Ammosova, Research Associate, Kalinowski D, Research Associate, Lovejoy DB, Research Associate, Jerebtsova M, Research Associate, Aníbal J. Ubache, Howard University, Jackie McCall Jr., Howard University, Israel Owolabi, Howard University, Sindhura Motaprthi, Howard University, Victor Gordeuk, Howard University, Des Richardson, Researcher/University of Sydney, Serge Nekhai, Howard University. **Objectives:** The objectives of the current research study include HPLC method validation and optimization for novel HIV iron chelating agents (BpT Series) and pharmacokinetic (PK) analysis of CaCo2 permeability data via compartmental modeling to evaluate GI absorption. **Method:** HPLC-UV with HS F5 column at 40 C, flow rate of 1 ml/min with a mobile phase composition of 2mM NH4Acetate/10mM EDTA buffer and acetonitrile, pH 5.8 was employed. Bidirectional dose dependent drug transport studies were performed in collagen coated transwell inserts. TEER and monolayer integrity was evaluated during the study. Multicompartment analysis with sink / non-sink conditions was employed for PK evaluation. **Results:** Bp4eT and Bp4aT exist as interconvertible Z and E isomers in aqueous media. RT was 3.7 (Dp44mT), 6.5 and 11.75 min’s (Bp4eT, E and Z isomers) and 7.5 and 12.75 min’s (Bp4aT, E and Z isomers). Intraday and interday assay precision (<10% CV) were observed over a linear range of 0.5-100uM for Bp4eT and 0.5-300uM for Bp4aT. The mean (n=3) correlation coefficients were 0.998 for Bp4eT and 0.999 for Bp4aT. Papp (AP-to-BL and BL-to-AP) values of 1.819 x 10-5 and 1.627 x 10-5 respectively for Bp4eT, and 2.756 x 10-5 and 2.534 x 10-5 respectively for Bp4aT at 300 µM. **Implications:** Effective HPLC method for estimation of Bp4eT and Bp4aT in transport buffer was validated and optimized. Preliminary results on iron chelator permeability, indicate rapid GI absorption and bioavailability. Multicompartment evaluation of an in-vitro transport study can provide valuable information for predicting human GI drug absorption.

**Inter Professional-Year Active Learning Strategy in Teaching Patient Counseling.** Quamrun N. Masuda, Appalachian College of Pharmacy, Craig R. Mullins, Appalachian College of Pharmacy. **Objectives:** To introduce an interactive Objective Structured Clinical Examination (OSCE)-style active learning exercise in integrated Pharmaceutical Compounding and Care Lab course and to assess its impact on developing patient counseling skills and professionalism in first professional year. **Method:** Patient counseling is a new exercise introduced in Pharmaceutical Compounding and Care Lab in 2010 on pilot basis, using P2 students as standardized patients. Based on student review and patient counseling performance in Milestone Exam 2010, this exercise was implemented fully in 2011. The course used common disease states and their most relevant therapeutic drug classes for disease management. Prior to each biweekly counseling session, P1 students were assigned homework on preselected list of drugs and given guided questions on how to counsel on those. They then counseled P2 students on one of the drug and the associated disease state at the OSCE station. The P2 students graded each session using a rubric similar to the APhA Patient Counseling evaluation rubric, and provided feedback to the P1 student and to the course faculty. **Results:** At this course, average score in patient counseling and professionalism was 95% with a standard deviation of 0.04. In Milestone exam these students scored 86% in interactive patient counseling. **Implications:** The addition of the inter professional-year active learning strategy was effective in teaching patient counseling and professionalism skills. Students of both the classes were benefited. This teaching model enhances students’ aptitude and may be used by other simulated patient-centered courses or in experiential education in other pharmacy, medical, or nursing schools.

**Partially Polymerized Lipidic Vesicles: A Concept Re-invented for Efficient Intracellular Delivery of Macromolecules.** Tamer Elbayoumi, Midwestern University’s College of Pharmacy-Glendale, Melanie A. Jordan, Midwestern University’s College of Pharmacy-Glendale, Megha Joshi, Midwestern University. **Objectives:** The project aims to develop and investigate the application of partially/block polymerized liposome formulations (polysomes) for efficient delivery of macromolecules in vitro, utilizing cancer cell-based systems. **Method:** Liposomes (10 mol% DOTAP, 20-40 mol% Cholesterol, and 70-50 mol% DiynePC), prepared using modified freeze-dry-rehydration method, were characterized for size and zeta potential. Model Silencer® Cy-3- (or FAM)-c-myc siRNA or FITC-BSA were encapsulated in liposomes, followed by assays for encapsulation efficiency and temporal stability of macromolecule-loaded liposomes, measured spectrophotometrically. Epi-fluorescence microscopy was used to track intracellular localization of fluorescein-labeled liposomes and cargo molecules, co-incubated with cancer cells, at different conditions. **Results:** Partially polymerized liposomes, confirmed by FTIR-spectroscopy, demonstrated primary broad size range (150-680 nm), with further control, via repeated extrusion, into different populations that varied with encapsulated material (approx. 200 nm for siRNA and 470 nm for BSA). The positive zeta-potential varied according to the ratio of the cationic membranotropic moieties employed (Av. +5 to +17 mV). Polysomes encapsulating FITC-BSA demonstrated good stability (<10% leakage) after 14 days in biological media. Moreover, intra-cellular uptake of polysomes and cargos was observed microscopically within 2 hours following co-incubation with murine colon carcinoma (C26), and breast cancer (4T1) cells. **Implications:** The structured development of cationic liposomal carriers, exhibiting reinforced membrane structure via modular polymerization, is advantageous for targeted macromolecule delivery, compared to traditional liposomes. Advantages such as enhanced biological stability and improved intracellular delivery would result in increased active protein concentration/target gene knockdown inside cancer cells.

**Teaching Pharmacuetics & Biopharmaceutics Using Contempory Problem Based Learning (PBL).** Quamrun N. Masuda, Appalachian College of Pharmacy, Rodney C. Siwale, Appalachian College of Pharmacy. **Objectives:** To foster student centered self-directed learning by promoting critical thinking and encouraging students to seek information from diverse sources. **Method:** On the first day of the 24-day Pharmaceutics course, the students were asked to develop an oral liquid formulation for osteoarthritis (OA) containing an NSAID naproxen, a COX-2 inhibitor valdecoxib, and an H2 antagonist ranitidine. Inclusion of disputed drug valdecoxib was to compel students to analyze risk factors and to develop a cautionary measure for patient education. This PBL required critical thinking, and problem solving in the context of preformulation research, formulation design, process development, packaging design, stability protocol writing, and patient insert creating. Faculty-led discussions were held in the classroom to facilitate students’ thought process. The students were motivated to participate because they had to propose a product during last week of the course. The discussions were...
focused on issues that needed to be addressed in a particular section of the PBL. The complexity of the topics increased as the PBL progressed. **Results:** All sub-groups presented unique products. The issues of solubilization were addressed by micelle formation, complexation with cyclodextrin, immediate and extended release suspension, and extended release solid powder for reconstituted suspension. Students’ performance and perception was measured in terms of various Ability Based Outcome competences using peer and faculty graded rubric. **Implications:** Students’ enthusiasm and quality of the completed project revealed that they learned the didactic materials at a higher conceptual level. This teaching tool can easily be implemented in any other basic science didactic course.  

**Transdermal Penetration of Compounded Promethazine and Ondansetron Formulations.** Christopher A. Chapleau, Samford University, John J. Arnold, Samford University, Robert M. Riggs, Samford University, Shea Click, Samford University, Christian S. Conley, Samford University. **Objectives:** Promethazine and ondansetron are routinely used in the treatment of nausea and vomiting. Often, patients are not able to take orally administered antiemetics. Consequently, the development of a transdermal delivery system for antiemetic drugs should be expected to be associated with better patient outcomes. **Method:** Our surrogate model for human skin was porcine skin. Promethazine and ondansetron were compounded into PLO gel formulations and penetration was measured by diffusion across excised porcine skin in Franz diffusion cells. HPLC was used to measure the concentration of permeated drug. **Results:** The results suggest that promethazine was able to penetrate efficiently through skin; while ondansetron penetration was very low. We hypothesized that penetration enhancers added to the PLO gel could increase the penetration of promethazine. The results suggest that the penetration enhancers utilized increased the penetration of ondansetron. However, the overall penetration of ondansetron was still extremely low. **Implications:** We demonstrated that promethazine formulated topically in a PLO gel can readily penetrate the skin and is a useful transdermal formulation. However, ondansetron was not as efficient in transdermal penetration as promethazine even when chemical enhancers were incorporated into the formulation. This study raises questions of the effectiveness of transdermal ondansetron PLO formulations. We are currently examining different techniques to increase transdermal penetration of ondansetron. We are presently modifying the pH of the ondansetron PLO formulation to determine if this plays a role in improving the transdermal penetration of ondansetron.  

**Web-based Dynamic Active Learning Modules in Teaching Pharmaceutical Calculations.** Quanrum N. Masuda, Appalachian College of Pharmacy. **Objectives:** Evaluate the effectiveness of student centered web-based dynamic active learning modules in teaching pharmaceutical calculations. The goal of this instructional approach was to involve students actively in their learning process and help retain their knowledge base for extended period of time. **Method:** The present work describes the use of the course management software Moodle for generating and administering dynamic practice module for the pharmaceutical calculations course. A total of seven pharmaceutical calculations practice modules were developed encompassing all concepts found in the text book ‘Ansel’s Pharmaceutical Calculations’. These modules were added as self-paced independent exercises and comprised 21% of the course grade. The modules were created using the built-in equation editors in Moodle. The question texts were taken from Ansel’s Pharmaceutical Calculations but the numerical values were replaced by variables within defined ranges. Typically a module was comprised of 15 to 40 questions, depending on the complexities of the learning objective. Students were allowed unlimited attempts for each module, with automatic grading. Questions were regenerated with new numerical values for each attempt, forcing students to practice with the privilege of retaining the highest grade of all the attempts. **Results:** Class average was 91% with standard deviation of 4.4. Students’ evaluation indicated that the pedagogy improved their understanding and helped them perform better in examinations. **Implications:** This teaching tool helps students’ knowledge base and saves instructor time towards managing and grading active learning. It may be applied to any calculation based course using any course management software.  

**PHARMACY PRACTICE**  
**Completed Research**  
**A Create-Your-Own Algorithm Activity to Help Students Apply Concepts and Select Patient-Specific Drug Therapy.** David G. Fuentes, Roosevelt University, Ty Vo, Pacific University Oregon. **Objectives:** To give students the opportunity to apply drug knowledge and make drug selection decisions within a Bipolar Pharmacotherapy module in response to a clinical vignette. **Method:** During lecture, students (n = 95) were given handouts instructing them to create treatment algorithms featuring mood stabilizers focusing only on their foundational knowledge of pharmacology and side effects. Students were next given a case vignette embedded within the lecture power-point presentation asking them to apply their algorithm to the vignette. **Results:** Seventy-eight percent of students (n = 74) reported they had deviated from their algorithm’s first-line agent and selected a second-, third-, fourth-, or fifth-line agent when given clinical patient information. Lithium (96%) and valproic acid (91%) were leading first- and second-line agents based on students’ foundational knowledge, respectively. However, topiramate, the leading third-line agent (42%), was selected for the patient by 65% of students. In course assessment items featuring drug selection for Bipolar disorders, students averaged 74-99%. Students (67%) agreed or strongly agreed that this activity was helpful to understand and apply the course material. **Implications:** This activity can help students review their foundational drug information while allowing them an opportunity to see the value of patient-specific clinical information while selecting drug therapy.  

**A Medication Error Reporting Form to Document Adverse Drug Events in a Practical Skills Laboratory.** Elizabeth Skoy, North Dakota State University, Heidi Eukel, North Dakota State University, Jeanne E. Frenzel, North Dakota State University. **Objectives:** To assess student knowledge and perceptions of adverse drug events (ADE) using a medication error reporting form. **Method:** First and third year professional pharmacy students dispensed manufactured prescription medications, sterile and nonsterile preparations during a pharmacy practice skills laboratory. All medications were checked for dispensing accuracy by a faculty member and students were required to complete a faculty-developed medication error form if an ADE occurred. Students were given an anonymous, voluntary survey assessing their perceived knowledge of ADEs based on their experience with the medication error form. Survey results were analyzed using chi-square tests. **Results:** Fifty-eight third year professional students and sixty-five first year professional students completed a survey. Following a semester of using the medication error reporting form, both samples reported a significant change in their perceived knowledge of ADE and medication error reporting (p<0.05). Both sample groups showed an increase in perceived knowledge of how to: communicate an ADE, identify an ADE, and
prevent an ADE from occurring. Both samples sets also showed a perceived increase in understanding the importance of identifying and addressing ADE. **Implications:** The use of a medication error reporting form in a practical skills laboratory increased students’ perceived knowledge of ADE and the communication of these events.

**A Vitals Training Video and Grading Form to Enhance Student Learning and Assessment.** Anisa Fornoff, Drake University, Heidi J. Price-Eastman, Drake University. **Objectives:** To develop a training video and grading form focused on temperature, pulse, respirations, and blood pressure skills used to enhance student learning in the Pharmacy Skills and Applications course series. **Method:** Two faculty members created a vitals video as a teaching tool and student reference, which focused on the appropriate way to measure a patient’s tympanic temperature, pulse, respirations, and blood pressure. The video was used as an aid during lecture and lab in Spring 2010. Students could access this video on Blackboard and iTunesU with their student identification number and password throughout the semester. A 75-point grading form was used to measure students’ success in the skill. Students were assessed at the end of the semester via a skill-based exam. Students must pass the vitals grading assessment of this exam with a 70% or greater to progress to the next course. **Results:** The survey was answered by 100/124 students (80% response rate). Of those students, 75% rated the videos as helpful in teaching them how to perform vitals and 78% found the explanations in the videos to be clear and easy to understand. Seventy-six percent would recommend to future students. The first time pass rate for the vitals assessment was 93.5% in Spring 2010 compared to 89.1% in Spring 2009. **Implications:** Overall, the first time pass rate of students increased with the addition of the video. A majority of students found the videos to be helpful and would recommend to future students learning these skills.

**Active Learning (AL) Implementation in an Advanced Elective Infectious Disease Course.** Levita Hidayat, Touro College of Pharmacy-New York, Keith Veltri, Touro College of Pharmacy-New York, Shreya Patel, Touro College of Pharmacy-New York. **Objectives:** To describe the development, implementation, and assessment of an infectious disease advanced elective course utilizing AL strategies. **Method:** Pedagogy for AL was incorporated via mini lecture, journal club and debate/controversy discussion. 48 students were enrolled in the four week elective course and 30% of course time was allocated for AL exercises. Mini lectures and journal clubs were designed as peer teaching tools. Debate discussion was designed to engage students more deeply in the process of assessing clinical patient case and evidence based medicine by encouraging critical thinking and fostering the development of self-directed learning. All activities were fundamentally designed as a stepwise approach in complementing each AL exercise. **Results:** Student’s awareness of antimicrobial resistance was improved (median (IQR range), 4 (3-4) vs. 5 (4-5) p = <0.0001). Student’s ability to critically evaluate infectious disease literatures and its application in informed clinical judgments were also enhanced through these AL exercises (median (IQR range) 3 (3-4) vs 4 (4-5) p= <0.0001). Through 5-points Likert scale, students agreed that AL should be part of pharmacy curriculum (median (IQR range), 5 (4-5)). In addition, students agreed that AL exercises improve their critical thinking, literature evaluation, and self-learning skills (median (IQR range), 4 (4-5), 4 (4-5) and 5 (4-5) respectively). **Implications:** Students were able to incorporate the evaluation of wide array of infectious disease literatures, critical thinking and informed clinical judgment to develop a therapeutic plan.

**Alternative Class Meeting Schedule to Enhance Learning in Diabetes Elective Course.** Amber Watts, Texas A&M Health Science Center, Lisa Killam-Worrall, Texas A&M Health Science Center. **Objectives:** Design an alternative class meeting schedule to enhance learning and application of skills in a diabetes elective course. **Method:** In the fall 2010, we offered a traditionally scheduled diabetes elective course. The course met once a week for 2 hours. We found that students were not prepared for class and had not retained previous material. We talked about ways to make the course more focused so that it did not compete with the rigors of required courses. We determined an alternative meeting schedule consisting of three Saturday sessions followed by 3 Monday sessions (total class meeting time was 30 hours; 2 hours credit) spread over 8 weeks would be sufficient. The Monday sessions were used to assess and evaluate the material learned the previous Saturday as well as address any areas for clarification. **Results:** As instructors, we enjoyed the focus and freedom of the alternative meeting schedule versus the traditional meeting schedule. The students seemed much more prepared for class and were more involved in discussions. We also had more time to incorporate active learning exercises in the course with the alternative schedule. In addition, we had a chance to assess and evaluate the student’s ability to provide patient education on diet, exercise, sick days, hypoglycemia, glucometer training, foot exams, insulin injection technique and medication counseling with the alternative schedule. We also incorporated SOAP notes as homework between sessions to reinforce concepts learned. **Implications:** We will continue to offer the diabetes elective with the alternative meeting schedule.

**Alternative Method of Final Assessment for Diabetes Care Elective.** Lisa Killam-Worrall, Texas A&M Health Science Center, Amber Watts, Texas A&M Health Science Center. **Objectives:** Describe alternative assessment at the conclusion of an elective diabetes course for pharmacy students. **Method:** Students were taught and tested on various patient education and assessment techniques. These included OSCE, mock counseling exercises, and quizzes in addition to writing SOAP notes on patient cases. Our ultimate goal for the diabetes course was to have the student be able to interview a patient, create a comprehensive care plan, and provide patient education and support for the care plan. For the final assessment, a diabetes patient scenario of a first patient visit was created. The student had to assess the patient, perform diabetes foot screenings, and recommend changes to the medications. The student left the evaluation area to collect his/her thoughts and returned to provide a plan and patient education. At the end of the visit, the student composed SOAP note. During the clinic visit, a patient actor (faculty member) reviewed the scenario prior to student interaction. The patient actor evaluated the student throughout the visit. The two course coordinators graded the SOAP notes. **Results:** Course coordinators felt that goal of course had been met when 80% of students completed the final assessment with a grade of B and above. Students had appreciated the in-class exercises and were excited about putting them together for the final. At least one student did comment that a mock final assessment between students would have been helpful. **Implications:** We will continue to offer the alternative assessment to conclude our diabetes course.

**An Interprofessional Study Investigating Barriers to Successful Healthcare Transition in Young Adults with Developmental Disabilities.** Deanna R. McGregor, The University of Texas at Austin, Carrie A. Hall, The University of Texas at Austin, Veronica S. Young, The University of Texas at Austin, Carol A. Nguyen, University of Texas Health Science Center San Antonio. **Objectives:** There is
limited literature on the healthcare transition process (HCT) of young adults with developmental disabilities (DD) from pediatric to adult-centered care. The objective was to detect disparities that young adults with DD experience during HCT, and identify potential methods to improve this process utilizing an interprofessional team. **Method:** The convenience sample of subjects consisted of young adults with DD who had recently completed a transition program. The fellowship consisted of an interprofessional team of students from five different professions. The fellows gathered, transcribed, and analyzed data from structured face-to-face interviews with people with DD and their caregivers. Major themes and subthemes were identified. The study was approved by the Institutional Review Board. **Results:** This study included 14 participants. Barriers to successful HCT included three major themes: access to care, provider characteristics, and patient-specific characteristics. Pharmacy specific subthemes were identified with 70% of participants reporting a lack of patient autonomy when managing medications, 38% utilizing unreliable resources for drug information, and 29% not receiving sufficient counseling by a pharmacist. Patients' perceptions of provider care and suggestions for improvement were also documented, noting that increased collaboration among health professionals and better patient-provider communication would improve HCT. **Implications:** There are a number of barriers to a successful HCT for young adults with DD. These barriers interfere with care from all types of healthcare professionals, including pharmacists. HCT can be improved through the collaboration of healthcare providers, exemplified by an interprofessional team. In order to best serve these patients, more provider training is needed.

**Analysis of Medication Incidents in Community Pharmacy.** Certina K.T. Ho, University of Toronto, Neil J. MacKinnon, Dalhousie University, Todd A. Boyle, St. Francis Xavier University, Tom Mahaffey, St. Francis Xavier University, Bev Zwicker, Nova Scotia College of Pharmacists, Heidi Deal, Dalhousie University, Andrea Scobie, Dalhousie University, Sean Higgins, Dalhousie University, Roger Cheng, ISMP Canada, Patricia Hung, ISMP Canada, Gary Lee, ISMP Canada. **Objectives:** SafetyNET-Rx is a continuous quality improvement program for community pharmacies in Nova Scotia, Canada. A component of this pilot project is to determine the underlying system-based contributing factors to medication incidents in community pharmacies and focus on the need for learning from incident reporting. **Method:** From August 2008 to January 2010, 1544 incidents were voluntarily reported by 13 community pharmacies participating in the SafetyNET-Rx Phase I pilot project. A quantitative analysis was performed on these medication incidents. **Results:** Of the 1544 incidents, 1293 (84% of 1544) were near misses, 250 (16% of 1544) resulted in no harm, of which 90 (36% of 250) involved patients who actually received and ingested the medication. Only one incident (0.06% of 1544) resulted in temporary patient harm, which required the intervention of contacting the physician immediately. Most incidents occurred at order entry, prescription assembly, and the dispensing stage. The most common types of incidents reported were incorrect dose (18%), incorrect duration of treatment (14%), incorrect strength/concentration (13%), incorrect drug (10%), and incorrect patient (7%). The top five medications reported were metoprolol, amoxicillin, rosvastatin, lorazepam, and metformin. Possible contributing factors to these medication incidents include look/sound-a-like drug names, interruptions in the workflow, misunderstood orders, look-a-like packaging, and illegible prescriptions. **Implications:** This analysis of medication incidents serves as an initial attempt to study factors that may contribute to medication incidents in community pharmacies. Further research is warranted in order to learn more about how to prevent these incidents from happening in the future and therefore improving patient safety.

**Assessing a New Elective Course in Legislation, Advocacy and Public Policy.** Leah Hollon, Appalachian College of Pharmacy, Terry Kilgore, Appalachian College of Pharmacy, Paul Gavaza, Appalachian College of Pharmacy. **Objectives:** To implement and assess a new elective course for second year doctor of pharmacy students at the Appalachian College of Pharmacy in the legislative, advocacy and public policy processes. **Method:** An elective course entitled “Pharmacists Affecting Legislation/Pharmacists in Advocacy” was developed to focus on leadership, advocacy, and legislative processes. The course addressed the following topics: leadership, governance, lobbying, advocacy and the development of legislation. In addition, students composed and presented model bills. A 5-point Likert pre- and post 10-item survey instrument was administered to 14 students within the elective course to assess personal knowledge and confidence of the legislative and policy processes. The 10-item survey was based on specific core objectives and competencies from the semester. Course format consisted of didactic lectures, guest lectures, active learning, reading assignments, pop quizzes, student model bill writing with presentation, and a final examination. **Results:** A paired-groups t-test showed a statistically significant increase in mean student knowledge on all ten items measured over the 10-week period ($p<0.05$). For example, students’ ability to formulate and propose a model bill increased significantly between the pre (mean=2.07, SD=0.917) and post survey (mean=3.86±0.616 ($t(7)=7.486, p<0.001$). Additionally, internal validity was congruent to scores observed on final examination (mean=94.14±4.14). **Implications:** An elective course in legislation and public policy increased student knowledge and enhanced their ability to participate within the legislative process as advocates within the healthcare system.
Assessing Baseline Knowledge of Foundational Science Topics Prior to Starting Cardiovascular and Psychiatric Pharmacotherapy Courses. Ty Vo, Pacific University Oregon, David G. Fuentes, Roosevelt University, Marianne Krupicka, Pacific University Oregon. Objectives: To assess baseline knowledge of foundational science content related to cardiovascular and psychiatric pharmacy and allow students to solidify foundational concepts as they learn about pharmacotherapy in these areas. Method: A baseline knowledge assessment quiz (BKAQ) was administered via Blackboard on day one of the cardiovascular (CV) and psychiatric (Psych) pharmacotherapy courses. The BKAQ reflected material taught to this cohort of students the year prior. Specific content included anatomy, physiology, pharmacology, and adverse effects. In the CV course, students had 30 minutes to complete a traditional, closed-book BKAQ. In the Psych course, students received an untimed, open-book BKAQ and must achieve 100% prior to taking the course exam featuring 5% of the BKAQ content. The BKAQ remained open for students to retake unlimited times until the morning of the pharmacotherapy exams. Results: Eighty-seven in the CV course and 91 students in the Psych course completed the BKAQ. The mean score on the first attempt were 65.1% and 93.8%, respectively. All students achieved 100% on the BKAQ before taking the Psych course exam. The mean score of BKAQ content on the CV and Psych pharmacotherapy exams were 91.9% and 93.7%, respectively. Implications: The use of BKAQ is an effective means to capture students’ baseline knowledge of foundational concepts, identify knowledge deficits and allow them the opportunity to review the foundational material. Authors adopted best practices from each model and implemented the Foundational Knowledge Examination model in various courses the following year.

Assessing Pharmacists’ Level of Comfort in the Treatment of Pregnant Patients. Diana Vinh, West Virginia University, Hannah Chambers, West Virginia University Hospitals, Kelsey Slanina, West Virginia University, Virginia Scott, West Virginia University, Amanda D. Geist, West Virginia University. Objectives: 1. Assess pharmacist comfort level in counseling and making over-the-counter (OTC) and prescription recommendations for pregnant women. 2. Determine the type of related continuing education desired by participants of this study. Method: We conducted an online survey of 1,711 pharmacists through the School of Pharmacy Office of Continuing Education mailing list. The study was designed to differentiate pharmacist comfort level in counseling and making medication recommendations in OTC and prescription medications for pregnant patients. Participation in the survey was voluntary, and all responses were anonymous and analyzed in aggregate. Standard descriptive statistical methods were used. The study obtained exempt status from the Institutional Review Board. Results: Between 58% and 78% of those surveyed indicated comfort in counseling and making OTC and prescription recommendations for pregnant patients. Over seventy three percent of the survey participants indicated they have never completed any CE regarding medication use during pregnancy; however approximately 97% indicated interest in CE in this subject. Implications: Although the majority of those surveyed are comfortable counseling and making recommendations for pregnant patients, between 22% to 42% of pharmacists felt uncomfortable with one or more areas of medication management in pregnant patients. Survey results indicate there is opportunity for pharmacists to improve their knowledge base and confidence in these areas. Survey results also indicate a need and an interest in developing CE topics in the area of drug therapy in pregnancy.

Assessment of Redundancies and Learning Strategies within a Doctor of Pharmacy Curriculum. Joseph A. Zorek, University of Illinois at Chicago, Suzanne M. Rabi, University of Illinois at Chicago, Nicholas G. Popovich, University of Illinois at Chicago. Objectives: To identify potential curricular content redundancies, quantify students’ examination burden, and assess active versus passive learning strategies within the didactic core curriculum of a doctor of pharmacy program. Method: Course syllabi for the didactic portion of the University of Illinois at Chicago (UIC) doctor of pharmacy curriculum were collected. A master document was created in Microsoft® Word with the following data collected for each core course: credit hours, lecture hours (passive learning), recitation/discussion/laboratory hours (active learning), number of examinations administered, and the titles of all lectures delivered. Core courses were evaluated for potential redundancies by cross-referencing individual course topics within the master document using the “Find and Replace” function. Potential redundancies were classified as minor (involving 2 courses), moderate (3 courses), and major (4+ courses). Results: Forty-eight potential curricular redundancies were identified. The number of courses within which individual redundant topics occurred ranged from 2 to 7. Eighty-eight percent (42/48) of potential redundancies were classified as minor, 4% (2/48) as moderate and 8% (4/48) as major. A total of 93 credit hours, 1014 lecture hours, 592 recitation/discussion/laboratory hours, and 77 examinations were identified for core courses. Implications: Skillfully using time conserved through the elimination of curricular redundancies, decreasing students’ examination burden, and shifting the emphasis from passive to active learning strategies would afford more opportunities for student skill development and direct patient care experiences through additional Introductory and/or Advanced Pharmacy Practice Experiences.

Assessment of Student Preferences for Small/Large Group Discussions and Prior Access to Learning Materials. Tonya Crawford, University of Illinois at Chicago, Atenea Robles, University of Illinois at Chicago, Nicholas G. Popovich, University of Illinois at Chicago, Benjamin Booth, University of Illinois at Chicago. Objectives: Assess pharmacy student’s perceptions of small group (SG) discussion (n=10) versus large group (LG) discussions in recitations (n>80) of patient cases and perceived learning benefits based on access to patient cases prior to recitation. Method: The survey instrument listed 7 items to determine respondents’ preferences. Respondents selected responses on a 5-point Likert Scale based on access to patient cases prior to recitation. Results: 110 students participated in the survey. 45.2% preferred (16.5% strongly agreed) to have access to the patient case(s) prior to attending recitation; 35.7% were neutral and 19.2% (3.5% strongly disagreed) did not want prior access to patient cases. 31.3% neither agreed nor disagreed that having cases before recitation would benefit their learning. 26.1% (5.2% strongly disagreed) disagreed and 42.6% (13% strongly agreed) agreed with the statement. Respondents least preferred SG discussions in separate rooms regardless of prior access to patient cases. Preference for SG or LG discussions in one auditorium to review patient case(s) as a whole group was similar regardless of if the received a patient case prior to recitation (46.7%-LG and 42.7%-SG) or the time of recitation (41.9%-LG and 44.8%-SG). Implications: Pharmacy students preferred to remain in one large room and conduct either SG or LG discussions due to consistency in information that is provided to all students. Preference for SG or LG discussions was not influenced by access to patient cases prior to recitation. Respondents were indifferent in regard to a learning benefit if patient cases were distributed prior to recitation class.
Assessment of Students’ Readiness for Self-directed Learning.

Therese I. Poirier, Southern Illinois University Edwardsville, Radhika Devraj, Southern Illinois University Edwardsville. Objectives: To assess students’ readiness for self-directed learning during the P1 year prior to beginning coursework; to determine the relationship of various student characteristics to students’ self-directed learning readiness (SDLR) and its subscales; and to compare P1 students’ SDLR and its subscales to pre-APPE and post-APPE data from another pharmacy school. Method: Eighty-three P1 students completed the Fisher’s SDLR electronic survey. Independent t- test, one way ANOVA, reliability analysis and Z-test analysis were completed. Results: Cronbach’s alpha revealed high reliability (0.920) for the SDLR and its subscales. The mean SDLR score was 166.42 (Range: 131.53 to 197). 84% scored a high readiness (SDLR > 150). No significant differences in SDLR and subscales scores were documented based on gender, age, pre-pharmacy coursework and PCAT scores. Statistically significant differences (p < 0.05) were noted in self control scores depending on leadership experiences. Similarly significant differences in self management scores based on pre-pharmacy GPA were noted. Z-test analysis revealed that P1 students had significant differences in SDLR, self control and desire for learning scores compared to pre-APPE students and significant differences in self management and desire for learning compared to post-APPE students from another pharmacy school. Implications: Baseline analysis revealed high level of readiness for self-directed learning among P1 students and few differences associated with demographic variables. However, P1 students appeared to have higher readiness for self-directed learning compared to more advanced students at another pharmacy school. This may imply that these students should be well prepared to navigate the pharmacy curriculum.

Assessment of the Admission Process with the Development of a Satellite Campus.

Suzanne M. Rabi, University of Illinois at Chicago, Thomas TenHoeve, University of Illinois at Chicago, Amy Lodolce, University of Illinois at Chicago, Norman Katz, University of Illinois at Chicago, Nicholas G. Popovich, University of Illinois at Chicago, Marieke D. Schoen, University of Illinois at Chicago. Objectives: To determine pharmacy students’ satisfaction level with the admission process. To compare and contrast the differences in overall satisfaction of the admission process with the opening of a new satellite campus. Method: Two student classes (c/o 2013 and c/o 2014) were administered a 17-question admission satisfaction survey. The main differences in the admission process were that students in the c/o 2014 were able to select a campus preference as there was a second campus available. Also, there was a pilot early admissions process for the c/o 2014. Only students accepted into the pharmacy program completed the surveys. Results: One hundred thirty four and 186 students completed the admissions surveys for class of 2013 and 2014, respectively. Students in the class of 2014 were overall more satisfied with the admissions process than in class of 2013 (86.6% agree versus 72.1%). The interview day increased the satisfaction of the class of 2014 more than the class of 2013 (80.3% vs 52%). The three top reasons for selecting the University of Illinois at Chicago were similar (irrespective of campus attended) between both classes: 1) reputation, 2) location and 3) cost. Implications: Overall, student criteria for selecting a college of pharmacy were similar despite the opening of a satellite campus. The general satisfaction appears to have increased which may be due in part to a slightly changed admission process. Results from this study may provide insight into how rolling admissions will affect overall satisfaction for future students.

Assessment of the Clinical Benefit of the Clinical Applications Course Sequence by Students and Preceptors. Elizabeth W. Blake, South Carolina College of Pharmacy, Celeste N. Rudisill, South Carolina College of Pharmacy, Shannon J. Drayton, South Carolina College of Pharmacy, Amy N. Thompson, South Carolina College of Pharmacy, Zaina Qureshi, South Carolina College of Pharmacy, Charles Benett, South Carolina College of Pharmacy. Objectives: To evaluate the impact and influence of a newly created Clinical Applications course sequence by- year (P4) student pharmacists before and after completion of advanced pharmacy practice experiences (APPE) and to determine the clinical benefit of the sequence as perceived by APPE preceptors. Method: The Clinical Applications course sequence consists of a case-based facilitation that integrates basic and clinical sciences starting in the first semester of pharmacy school. A 16-item survey instrument was electronically mailed to P4 students prior to starting and at the completion of their APPEs. A separate 10-item survey instrument was electronically sent to all active APPE preceptors for the College of Pharmacy. Survey questions followed a standard 5-point Likert scale. Descriptive statistics were applied for data analysis. Results: Response rates were 42% and 44% for the pre- and post-survey instruments, respectively. The internal consistency estimate for the pre-survey was 0.96 and 0.92 for the post-survey, indicating good reliability for multiple-item scale. Overall, pharmacy students agreed that the clinical applications sequence prepared them for clinical rotations and that clinical rotations would have been harder without the preparation provided. The response rate for APPE preceptors was 95%. The internal consistency estimate was 0.96, indicating good reliability for multiple-item scale. Overall, APPE preceptors agreed that the clinical applications course sequence better prepared P4 students for clinical rotations. Implications: Consistent exposure to clinical scenarios prior to APPEs enhances the clinical experience for both the student and the preceptor. Responses will also be used for quality improvement of the course.

Attitudes and Knowledge of Healthcare Professional Students Regarding Hookah Smoking. Jane E. Krause, Purdue University, Tristan Kirby, Purdue University. Objectives: The purpose of this study was to assess College of Pharmacy, Nursing, and Health Science students’ perspectives (i.e., attitudes and knowledge) regarding hookah smoking. Method: A 14 item survey was mailed to the students enrolled in the College. Six items focused on student attitudes and eight items focused on student knowledge of hookah smoking. Demographic information (age, gender, major, personal use of hookah, attendance at an event where hookah was used in the last six months, whether information had been taught in one of their courses) was also collected. Descriptive statistics were calculated for each survey item. Results: A total of 517 (20.12%) surveys were analyzed. Over one-third of the participants (35.6%) had used hookah in the last six months while over one-half (52.2%) of the respondents had been to an event/place where hookah was used in the last six months. The mean for the knowledge questions was 63.02%. Almost three-fourths (72.53%) of the respondents agreed that hookah establishments offer a social club environment for students. The majority (82.59%) disagreed with the statement, “I believe students are knowledgeable about hookah and its potential effect on a person’s health”. The vast majority (88.59%) of the students agreed that more information should be available to students regarding hookah and its potential effect on a person’s health. Implications: Hookah smoking has become a popular trend on college campuses. Additional studies looking at larger, more diverse populations and ways to reduce its prevalence are suggested.

Changes in Pharmacy Students’ Attitudes, Beliefs, and Competency about Medicare Part D Through Education. Suzanne M. Galal, University of the Pacific, Rajul A. Patel, University of the Pacific, Christine M. Phou, University of the Pacific, Thai K. Huong, University of the Pacific, Mark P. Walberg, University of the Pacific, Pamela G. Tien, University of the Pacific, Sadaf A. Ashfaq, University of the Pacific, Joseph A. Woelfel, University of the Pacific, Sian Carr-Lopez, University of the Pacific, Emily K. Chan, University of the Pacific. Objectives: We sought to examine how pharmacy students’ perceptions and knowledge about Medicare Part D (Part D) and other services offered to beneficiaries (e.g., Medication Therapy Management [MTM] and Immunizations) changed as a result of an elective course comprised of didactic education and experiential training. Method: Thirty-three pharmacy students were enrolled in a Part D elective class. Students were given an assessment tool which gauged their confidence in being able to assist seniors with their Part D plans, perform MTM, and provide immunizations. Students’ perceptions about the relative importance of various MTM services were recorded and their knowledge about the Medicare benefit, particularly Part D, was evaluated. The assessment tool was administered at three time points: 1) first day of class, 2) last day of formal lecture and 3) after completion of community outreach activities during which students assisted Medicare beneficiaries with the aforementioned services. The total number of beneficiaries that each student assisted during outreach events was recorded. Results: On average, each student helped 12 Medicare beneficiaries with their Part D plans and 11 with MTM. Upon completion of the outreach events students’ self-reported confidence in providing each of the services significantly improved from the first day of class. Perceptions about the importance of various aspects of MTM interventions significantly differed from the beginning of the course. Significant increases in knowledge assessment scores, ability and efficiency to assist with Part D plans were observed upon completion of the course. Implications: Students’ attitudes, beliefs and competency improved after both didactic and experiential education.

Clinical Cultural Competency of 3rd Year Doctor of Pharmacy Students (3PD) in Florida Public Institutions. Olihe N. Okoro, University of Florida, Folakemi T. Odedina, University of Florida, R. Renee Reams, Florida Agricultural and Mechanical University, W. Thomas Smith, University of Florida. Objectives: The immediate objectives were to: (1) Evaluate and compare the level of clinical cultural competency and knowledge about health disparities between 3PD students at the University of Florida - UFL and Florida A&M University - FAMU; and (2) Explore the demographic correlates of clinical cultural competency and health disparities knowledge. Method: A cross-sectional survey study design was used. To accomplish the study objectives, t-tests and multiple regression analysis were employed. Results: On the average, students surveyed had low health disparities knowledge; minimal skills in dealing with socio-cultural issues; and low comfort levels in dealing with cross-cultural encounters. Means scores were significantly higher for students in FAMU than compared to UFL. Students with relevant formal training outside the school curriculum, who spoke another language(s) other than English, non US-born, >24yrs old, attending FAMU, and from a minority population were likely to be more culturally competent and more knowledgeable about health disparities. Implications: Our findings suggest that clinical cultural competency and health disparity instruction may not be adequately incorporated into the pharmacy school curriculum in Florida public institutions. The need for pharmacists to be well prepared to care for a diverse population is crucial and urgent because minority populations (who will soon constitute a larger proportion of the US population) share disproportionately greater burden of many chronic diseases and have poorer health outcomes. Furthermore, it may be necessary to place emphasis on cultural competency as a skill set in pharmacy student populations that do not have a significant minority representation.

Collaboration with Department of Health Creates a Win-Win Situation for Immunization Training and Delivery. Kimberly A. Messerschmidt, South Dakota State University, Kelley J. Ochlike, South Dakota State University, Annette M. Johnson, South Dakota State University. Objectives: To enhance pharmacy student immunization training and provide a valuable service to the community. Method: For the past three years, pharmacy students and faculty worked with the City and State Department of Health (DOH) to provide an annual influenza clinic for city and state employees. The clinic also served as a Points of Dispensing exercise in which the DOH assessed their ability to respond to a community disaster. Students were in charge of, and rotated through the following stations: clinic flow, vaccine preparation, patient screening, and vaccination administration/documentation. In 2010, students were surveyed as to the perceived value of the experience, and the DOH provided feedback regarding benefits received from the partnership. Results: A total of 869 vaccinations were administered during the four hour clinic. Fifty-eight of 69 (84.1%) P3 students volunteered for the event. Forty-four (75.9%) responded to the survey. All students felt the clinic was a useful training experience that increased their overall confidence in delivering vaccinations. Over 90% felt that their participation increased the likelihood of future involvement in immunization activities. The DOH noted the following benefits: decreased flu clinic staffing requirements (28 vs. 35 hours for city DOH employees), enhanced ability to evaluate the city’s disaster preparedness response plan, and increased vaccination rates for city employees (22.9% increase compared to 2009). The partnership also facilitated the development of a successful model for citywide H1N1 clinics. Implications: Partnering with the DOH enhanced
student vaccination training while providing a valuable community service.

Compounding in Schools of Pharmacy: A Report of the AACP COS Task Force on Compounding. Robert P. Shrewsbury, University of North Carolina at Chapel Hill. Objectives: In August 2009, the Council of Sections for AACP established a Task Force to evaluate compounding education in Schools of Pharmacy. The Task Force consisted of seven faculty members involved with compounding education at their respective Schools of Pharmacy. The group was charged to assess the status of compounding education in AACP member institutions, and recommend a compounding curriculum for basic and advanced compounding. Method: The Task Force designed a twenty-two question survey, and administered the survey in late June, 2010 to faculty members of the AACP Pharmaceutics and Pharmacy Practice list serves. The survey received 137 respondents, and an interim report was given to the AACP COS at the 2010 Annual Meeting in Seattle. Results: The survey questions were grouped into eight curricular topics, and the Task Force developed recommendations for each of the curricular topics. The topics were: I. Definition and importance of inclusion in curriculum; II. Time commitment to compounding education; III. The laboratory facility; IV. Laboratory instructional content; V. Current financial investment in the lab; VI. Staffing and time; VII. Assessment of student work; VIII. Elective course. Implications: The recommendations state that Schools of Pharmacy should have a required compounding education experience of four semesters in a well-staffed and funded laboratory facility; definitions of “well-staffed and funded” are included in the report. The report suggests a compounding curriculum, and the recognition that some Schools may want to have an additional elective compounding course.

Course Action Plan Impact on Course Outcomes. Judy Nguyen, Sullivan University. Tracy Nguyen, Sullivan University, Kimberly K. Daughtery, Sullivan University, Hieu T. Tran, Sullivan University. Objectives: Course evaluations conducted each quarter at Sullivan University College of Pharmacy (SUCOP) are part of the overall college assessment plan and are used to improve course delivery outcomes. The respective Department Chair and Course Coordinator review the course evaluation and formulate an action plan for improvement to be reviewed by the curriculum committee. This study will follow to see whether the action plans formulated from the first professional year (PY1) course evaluations for the inaugural Class of 2011 lead to improvements in the Class of 2012 course delivery. Method: Course evaluations from the Class of 2011 leading to course action plans were compared to course evaluation results from Class of 2012. Results were analyzed using the student paired t-test (p-value <0.05). Results: Comparison and follow-up of 40 action plan items from 19 courses in PY1 have shown the following results: 1 (2.5%) action plan item resulted in a statistically worse score compared to the Class of 2011 course evaluations, 19 (47.5%) action plan items resulted in a non-statistical change compared to the Class of 2011, and 20 (50%) action plan items resulted in statistically better scores compared to the Class of 2011 after implementation of the action plan item. Implications: The results of this study have shown that the course action plan strategy used by SUCOP has helped to identify strengths/weaknesses for course improvement. This poster has also shown the above course action plan process is a potentially valid tool for curriculum assessment. Data will continue to be collected to confirm the results.

Critical Characteristics of a Pharmacist: Linking Measures of Practice to Admissions. Peter M. Haeg, University of Minnesota, Doneka R. Scott, University of Minnesota, Charles T. Taylor, University of Minnesota. Objectives: The role of a pharmacist has changed significantly during the recent past, but our criteria to evaluate PharmD applicants have not significantly changed. The purpose of the study was to determine the critical characteristics of successful practicing pharmacists and use the results to inform our admissions processes. Method: Pharmacists, patients, faculty/staff members, students and health care professionals participated in semi-structured interviews or focus groups to determine their most important criteria for evaluating successful pharmacists. The 1-hour interviews or focus groups were recorded and transcribed. The resultant criteria were mapped to the existing admissions criteria at the University of Minnesota College of Pharmacy to identify areas of improvement. Results: 31 patients, 18 students, 13 pharmacists, 11 faculty/staff members, and 5 health care professionals participated in the study. Based on a qualitative assessment, nine critical characteristics of success were identified (two cognitive, seven non-cognitive): intellectual capacity, organizational efficiency, problem-solving skills, communication skills, relationship-building skills, compassion, integrity, familiarity with the profession of pharmacy, and leadership skills. When mapped against the existing admissions process, we found that noncognitive skills were not being fully and consistently measured and evaluated. Implications: If we can effectively evaluate the identified criteria at the point of admission into a PharmD program, we should be better able to admit applicants who already possess some of these successful characteristics. Better tools to measure non-cognitive skills will be needed in order to make these assessments.

Curricular Content Pertaining to Rapid Diagnostic Tests within Colleges of Pharmacy in the United States. Stephanie L. Freed, Ferris State University, Connie A. Valente, Ferris State University, Jennifer K. Hagerman, Ferris State University, Donald G. Klepser, University of Nebraska Medical Center, Michael E. Klepser, Ferris State University. Objectives: The purpose of this study is to quantify the extent to which content on rapid diagnostic tests (RDT) is included in curricula of colleges of pharmacy (COP) in the United States. Secondly, to describe the means of instruction by which pharmacy students are exposed to RDT procedures and how this knowledge and proficiency are assessed. Method: A thirty-six question, electronic survey was created and sent via email to department heads of all COP in the U.S. from December 2009 through March 2010. Results: Of the 119 department heads asked to participate in the survey, 40 responded. Ninety-three percent of respondents said content on RDT was included within their curriculum. Of these, 97% had exposure to endocrine RDTs, 86% to cardiovascular, 24% to infectious diseases, and 84% to women’s health. Class time allotted to exposure to endocrine RDTs, 86% to cardiovascular, 24% to infectious diseases, and 84% to women’s health. Class time allotted to RDTs ranged from less than one hour to greater than four hours. The majority of colleges included both didactic and practical formats (92%) as means for content delivery. Students were assessed by: demonstration (76%), written (51%), and verbal (22%). Implications: The results of this study indicate that not all COP include RDTs in their curriculum. Although many colleges claim to include content regarding various RDTs, exposure to infectious diseases RDTs is largely absent. Insuring that all pharmacy students are educated and trained on RDTs could potentially reduce the time to initiation of appropriate treatment, improve healthcare resource utilization, and improve patient satisfaction with healthcare.

Development of a Prescription Refill Protocol (PRP) in an HIV/AIDS Clinic. Keith N. Herist, The University of Georgia, Laura E.L. Thompson, The University of Georgia, Bryan P. White, The University of Georgia, Patricia S. Bowman, Georgia Health Science

**Design and Evaluation of Health Literacy Instructional Video for Pharmacy Students.** Lakesha M. Butler, Southern Illinois University Edwardsville, Radhika Devraj, Southern Illinois University Edwardsville, Cathy Santanello, Southern Illinois University Edwardsville. **Objectives:** 1) Assess the impact of the first created pharmacy health literacy instructional video on student’s ability and confidence to communicate with low health literacy patients in a typical pharmacy setting. 2) Compare assessment of health literacy video to previously used health literacy instructional strategy/tool. **Method:** Health literacy was offered as part of a required three credit course titled “Health Promotion and Literacy” during fall of the P-3 year. A health literacy role play activity was performed in the course followed by the showing of a new health literacy instructional video. Two separate survey instruments were developed based on study objectives and piloted among students in the course to individually assess both active learning strategies and for comparison of the strategies. Independent t-tests were used to compare means of each survey question. **Results:** Statistically significant differences were noted on 4 out of the 5 survey questions in which the instructional video was better than the role play activity in each case. **Implications:** A pharmacy health literacy instructional video significantly improved student’s confidence in communicating with low health literacy patients in a pharmacy setting and enhanced their understanding of health literacy more than compared to the currently used health literacy role play activity. Therefore, the instructional video will replace the role play activity in future course offerings.

**Design and Implementation of a Course Review Process.** Adam M. Persky, University of North Carolina at Chapel Hill, Kimberly H. Deloatch, University of North Carolina at Chapel Hill, Wendy C. Cox, University of North Carolina at Chapel Hill, Mary T. Roth McClurg, University of North Carolina at Chapel Hill, Pamela U. Joyner, University of North Carolina at Chapel Hill. **Objectives:** To design, implement, and test the feasibility of a course review process to enhance the quality of pharmacy education. **Method:** A course review process was designed for all required courses in the professional program (n = 30) and facilitated by the Curriculum and Assessment committees. The review relied on use of a rubric addressing five areas: course layout and integration, learning outcomes, assessment of learning, resources and materials, and learner interaction. Course directors completed a self-assessment of the course. Each review team conducted the review, using the rubric and course director’s self-assessment, and submitted a written report to the Curriculum Committee. The two committees discussed all course reviews in a full day retreat. Course directors received a written summary, outlining recommendations for improving the course, and submitted a written reply addressing each recommendation. To close the loop, the committees will evaluate the extent to which recommendations were accepted and implemented. An attitudinal survey was administered to all participants. **Results:** One-hundred percent of all required courses were reviewed from January to August 2010, resulting in 104 recommendations (mean 3.5/course). Over 75% of course directors responded to the recommendations. Ninety-five percent of reviewers and 85% of course directors agreed the process was objective and important **Implications:** Reviews are complete for all required courses in the professional program. Future work will explore the effectiveness of the course review process in improving the quality of pharmacy education.

**Developing Medical and Pharmacy Students through Collaborative Care of Senior Mentors: A Pilot Interprofessional Program.** William M. King, South Carolina College of Pharmacy, Sarah P. Shrader, South Carolina College of Pharmacy, Rebecca Hardin, Medical University of South Carolina, Kathleen Wiley, Medical University of South Carolina. **Objectives:** The intent of this project was to develop a pilot interprofessional program designed for the clinical assessment of geriatric medication use and evaluate student and mentor attitudes about interprofessional education and healthcare delivery. **Method:** The study obtained approval from the institutional
Development and Implementation of a Pediatric Concentration. Jennifer P. Elliott, Duquesne University. OBJECTIVES: A 2009 White Paper published by the American College of Clinical Pharmacy identified the critical need for inclusion of education on medication utilization in the pregnant and pediatric populations. The objective of this innovation was to create a comprehensive Pediatric Concentration to respond to this curricular call. METHOD: The Pediatric Concentration requirements are based upon the “Rule of 3”. Students are first introduced to general pediatric topics/terminology during a traditional lecture-based course. Using this knowledge as a framework, they are mentored through a process of self-directed learning throughout two successive problem-based learning (PBL) courses. The first PBL course follows a mother from conception through labor and delivery. The second course follows babies from the neonatal period through adolescence. Students finish the concentration with a pediatric experiential education rotation where they learn firsthand how patient-specific factors together with knowledge gained in the classroom can influence clinical decision making. RESULTS: Improved knowledge and confidence in treating the pregnant/lactating mother and pediatric patient were observed over the course of the concentration. A pre/post test revealed a 30% and 25.7% increase in baseline knowledge for the pregnancy/lactation and pediatric pharmacotherapy courses, respectively. A pre/post confidence survey revealed the percentage of students who felt confident in designing a drug regimen or defining therapeutic goals for these patient populations increased from 60.0 and 71.72% pre-survey to 82.8 and 85.0% post-survey, respectively. IMPLICATIONS: A concentration is an effective model to teach therapeutics of special populations within the pharmacy curriculum. This teaching model should be easily adaptable to other specialties.

Development of Assessments for Use on Advanced Pharmacy Practice Experiences. Andrew J. Cranmage, St. Louis College of Pharmacy, Jamie Pitlick, St. Louis College of Pharmacy, Amy M. Drew, St. Louis College of Pharmacy, Lindsay M. Gebhart, St. Louis College of Pharmacy, Julie A. Murphy, St. Louis College of Pharmacy. OBJECTIVES: To develop two comprehensive assessments related to the common disease states seen in both inpatient and outpatient settings. METHOD: Syllabi from the didactic Therapeutics sequence were reviewed to identify topics which Advanced Pharmacy Practice Experience (APPE) students were previously assessed. Seventy-eight topics were identified. After critical assessment, 15 topics were deemed to be most relevant to an inpatient or outpatient APPE rotation. A psychometrician was consulted to establish an infrastructure for the question bank. The content experts, on our campus, for each topic were asked to submit 15 multiple choice questions. Writers were asked to develop questions that were 1) evenly distributed between inpatient and outpatient care, 2) written at application and analysis Bloom’s levels in a 7:3 ratio, and 3) representative of the five roles of a pharmacist: assessment of disease states, evaluation of drug therapy, recommendation of new therapy, monitoring of therapy, and education of patients and/or healthcare professionals. RESULTS: To ensure the integrity of the question bank, each submitted question was analyzed per the above criteria. The final question bank contained ten questions for each topic area. The questions were then divided evenly to create two 75-question assessments. IMPLICATIONS: These assessments will be utilized as pre- and post-rotation quizzes to assess student learning on APPEs. Faculty members will be able to determine how well their rotation educates students through these assessments. This information could then be used in the individual faculty member’s dossier and other faculty assessments for demonstration of the effectiveness of teaching during APPEs.

Development of Pictographs for Providing Medication Information to Patients with Limited English Proficiency. Patricia M. Grace, University at Buffalo, The State University of New York, Erin M. Slazak, University at Buffalo, The State University of New York, Mark J. Wrobel, University at Buffalo, The State University of New York, Murali Ramanathan, University at Buffalo, The State University of New York, Jessica V. Gonzalez, University at Buffalo, The State University of New York, Karen N. Shin, University at Buffalo, The State University of New York. OBJECTIVES: In addition to low literacy rates and prescription label ambiguity, language barriers contribute to misinterpretation of prescription labels. Approximately 21 million people in the United States have limited English proficiency, and 19% of Americans speak a non-English language at home. The purpose of this study is to determine if persons with limited English proficiency have a better understanding of directions for taking medication when information is presented as a pictograph as compared to directions printed in English. METHOD: Subjects with limited English proficiency (LEP), determined by an Assessment of English Proficiency Survey, were included in the study. Participants were shown a set of three different medication instructions printed in English and the same instructions as pictographs. Participants were asked to translate the instructions to their primary language, and also to describe how to take the medication. Half the participants viewed the written versions first, and half viewed the pictographs first. RESULTS: Written instructions were misinterpreted by 37% of subjects and 56.7% of subjects misinterpreted pictographs. Repeated measures analysis indicate that there is a very strong effect of LEP on interpreting information incorrectly (p = 0.005). Subjects with lower LEP scores had a reduced chance of interpreting information correctly. Repeated measure analysis indicate that there is no order effect (p = 0.43). IMPLICATIONS: Persons with very low English proficiency have difficulty interpreting directions presented in both written and pictorial form. The pictographs used in this study require redesign to reduce ambiguity and take into account cultural differences in picture interpretation.
Development of an International Policy and Outcomes Advanced Pharmacy Practice Experience (APPE). Melody H. Ryan, University of Kentucky, Douglas T. Steinke, University of Kentucky, Stuart A. McTaggart, NHS National Services Scotland. Objectives: International APPEs allow students to experience healthcare in other countries. While international clinical work is valuable, gaining perspective on population-based decision making is also important. Our objective was to establish and evaluate an elective international APPE in policy and outcomes. Method: National Health Service (NHS) National Services Scotland (NSS) collects and hosts national datasets concerning NHS and population health. These are used to monitor and support policy development, including prudent medicine use. Contact was established with a pharmacist at NSS, a clinical education agreement executed, a syllabus developed, preceptor training completed, and a site visit conducted. Students and the preceptor completed standard APPE evaluations. Debriefings elicited further information, focusing on aspects not assessed with standard evaluations (e.g., cultural adjustments). Results: Four students completed the APPE; three are scheduled for 2011-2012. Students rated the experience highly, agreeing or strongly agreeing with positive statements on evaluations. A narrative excerpt reveals the impact of the experience, “This was an experience that I could not have had anywhere in the United States, yet it will provide me with more insight and knowledge when I return to practice in the United States.” Students participated in projects during the APPE, wrote newsletter articles, and published one manuscript. A second manuscript is in preparation. One student is pursuing graduate training in Scotland to work with the NSS database. Implications: This international policy outcomes APPE was well received by students and the preceptor, resulting in scholarly activity for both. It serves as a development model for APPEs in policy and outcomes.

Development of an Oncology Pharmacy Elective for Third-Year Pharmacy Students. Amy Pick, Creighton University, Kelly Nystrom, Creighton University. Objectives: With the increase in cancer diagnoses, new oncology therapies and novel treatment regimens, the need for competent practicing pharmacists is critical. In order to provide pharmaceutical care to oncology patients, students must have a solid understanding of drug therapy, patient safety and psycho-social aspects of cancer. Method: We developed a one-hour, 15 week, oncology pharmacy elective that provides instruction in the pharmacotherapeutic management of oncology diseases. We balanced the course between therapeutic topics that supplement our spring semester Pharmacotherapeutics lectures and psycho-social topics that the students do not receive elsewhere (i.e. hospice/palliative care, long-term effects, CAM). A cancer survivor panel is held to allow students to ask questions and see the effects cancer has had on a patient’s life. Assessment is based on quizzes, active participation in an oncology service learning project and discussion posts. Results: This course has been offered yearly to third year pharmacy students since 2008. We have had tremendous response with approximately 30 students enrolling each year. Student evaluations have been extremely positive with student’s noting they enjoy learning about the supportive/emotional approaches of oncology patients. We have received positive feedback from students and will continue to offer this course to our future practitioners.

Development of the Residency Interviewing Preparatory Seminar (RIPS) Elective Course. Joshua Caballero, Nova Southeastern University, Sandra Benavides, Nova Southeastern University, Kevin A. Clauson, Nova Southeastern University, Jennifer G. Steinberg, Nova Southeastern University, Timothy Gauthier, Nova Southeastern University, Jehan Marino, Nova Southeastern University, Nancy Hart, Nova Southeastern University. Objectives: The purpose of this research is to describe the unique and innovative Residency Interviewing Preparatory Seminar (RIPS) course. Method: The RIPS elective course was designed to assist students during their last professional year to prepare them for the residency application process. The course learning objectives focused on improving a student’s interviewing and presentation skills as well as developing their curriculum vitae (CV) and personal statement. Results: The RIPS course was an intensive eight week elective open to any fourth year pharmacy student pursuing a residency. The course began with an overview of the residency application process (e.g., ASHP Midyear Clinical Meeting, the matching process). Subsequently, students were required to submit their CV and personal statements to two assigned faculty mentors for critique. To simulate residency interview components, students completed several in-class timed activities including a formal topic or case presentation, a literature evaluation (i.e., article dissection), developed an abstract from a journal article, and evaluated and developed treatment plans for two patient cases. Lastly, students participated in mock interviews: two with individual faculty members and one with a panel of faculty members. Due to the high level of individualized feedback provided, enrollment was limited. Student evaluations were collected upon course completion. Implications: The RIPS course exposed students to various activities they may encounter during the interview process. This may result in increased confidence during residency interviews and ultimately success in securing a residency. Despite initial positive evaluations, future assessments are needed via survey and success rate of obtaining a residency.

Difficulty and Discrimination of Multiple-Choice Examination Questions in Therapeutics/Pathophysiology Courses. Joshua Caballero, Nova Southeastern University, William R. Wolowich, Nova Southeastern University, Sandra Benavides, Nova Southeastern University, Jehan Marino, Nova Southeastern University. Objectives: Published data regarding the difficulty and discrimination of examination questions are lacking. Therefore, the objective of our study was to determine if differences exist among question type. Method: After Institutional Review Board approval, examination questions were retrieved from all Therapeutics/Pathophysiology courses. Five categories were developed: standard, case-based, statement, True/False, and K-type questions. Each category was further divided into four subgroups: recall, pathophysiology, dosing, or calculation. Questions were then categorized using the Delphi technique. Item response theory data were analyzed for difficulty and discrimination using ANOVA or nonparametric ANOVA (Kruskal-Wallis) with significance at p<0.05. Results: Due to small sample size, only standard, case-based, and statement questions were analyzed. As a result, 493 questions were included in the final analysis. There were 183 standard questions (median difficulty index of 0.86; mean discrimination score of 0.22). Standard dosing and standard pathophysiology questions were more difficult than standard recall (p<0.013). There were 219 case-based questions (median difficulty index of 0.80; mean discrimination score of 0.25) which showed no statistical differences in difficulty or discrimination among subgroups. There were 91 statement questions (median difficulty index of 0.87; mean discrimination score of 0.24) which also revealed no statistical differences in difficulty or discrimination among subgroups. Overall, case-based questions were statistically more difficult than standard or statement questions (p<0.001). Case-based questions were also more discriminating than...
standard questions (p=0.047). **Implications:** Variations may exist between some types of questions. Our data demonstrate case-based questions appear more difficult and discriminating. More studies are needed to confirm our results.

**Do Pharmacy Students Retain Knowledge in a Block-System Curriculum?** Eunice P. Chung, Western University of Health Sciences, Donald I. Hsu, Western University of Health Sciences. **Objectives:** Block-system covers one subject area intensely before moving onto the next. A potential down side to this approach is difficulty in retention of knowledge due to extended time elapsed before the subject is revisited. This study aims to evaluate whether students are retaining core competency knowledge in a block-system curriculum. **Method:** Diabetes patient management is a core competency for all pharmacy graduates. A diabetic patient management case was written and tested in an Objective Structured Clinical Examination (OSCE) setting for second-year and third-year pharmacy students. Second-year students learned diabetes 2 months prior to the OSCE, while the third-year students learned diabetes 15 months prior to the OSCE. The knowledge component was separated into 5 components and global communication skill (GC) was assessed using a standardized rubric. The OSCE results for two groups were compared for analysis. **Results:** 144 second-year and 129 third-year pharmacy students participated in the OSCEs. Third-year pharmacy students performed significantly better (p<0.001) than the second-year pharmacy students with median score (interquartile range) 13 (11-17) vs. 11 (8-13), respectively. In all individual knowledge components, third-year students performed significantly better (p<0.05). However, second-year students scored significantly higher in the GC component, with a median (interquartile range) of 16 (13-17) compared to the third-year students, 14 (12-16). **Implications:** The results indicate that block-system curriculum effectively promotes retention of core knowledge. The difference in GC scores could be explained by launching of the new communications curriculum which affected second-year students but not the third-year students among other factors.

**Effect of Podcasting on Student Performance in a Pharmacotherapy Module.** David W. Stewart, East Tennessee State University, Peter C. Panus, East Tennessee State University, John H. Kalbkleisch, East Tennessee State University James H. Quillen College of Medicine. **Objectives:** The objective was to determine the effect of podcasting on student performance in a pharmacotherapy course. **Method:** In an effort to increase in-class active learning time and improve understanding of the material in a third year pharmacotherapy course, podcasts were developed to cover specific topics in a didactic fashion and were made available outside of class. Students in the same course of the previous year received identical in-class didactic instruction for these topics. End-of-course exam scores for these specific topics were compared with the t-test and analysis of covariance (using GPA at the end of year 2 and PCAT percentile as covariates). **Results:** Students who received podcasting out of class with additional classroom time devoted to active learning performed worse based on exam scores compared to students who received traditional didactic instruction alone. The class averages were significantly different (77.5 vs. 72.9, p=0.019) and this difference remained significant after adjusting for the covariates GPA (77.6 vs. 72.8, p=0.013) and PCAT (78.3 vs. 72.2, p=0.001). **Implications:** Prior research has shown that currently, the majority of colleges and schools of pharmacy are utilizing active learning. The results of this study suggest there are some students who seem to be hindered instead of helped when this particular strategy studied was utilized. This suggests the academy needs to seek evidence for employing new teaching strategies.

**Effects of an Integrated Internal Medicine and Ambulatory Care APPE on Clinical Interventions.** Michael Gonyea, Northeastern University, Maureen McQueeney, Northeastern University. **Objectives:** Most APPEs occur from 4-6 weeks, a narrow window for students to feel confident in their clinical responsibilities and in their ability to accurately document clinical interventions. We sought to evaluate the effects of an integrated 12 week APPE on documentation of clinical interventions in an internal medicine (IM) and ambulatory care (AC) setting and to quantify value added to students, preceptors and institutions of this model. **Method:** A 6 week AC and IM APPE were integrated into a 12 week APPE comprised of a fluid structure where students transitioned from inpatient to outpatient services, increasing student exposure to patients transitioning from inpatient to outpatient care. Clinical intervention documentation was required via a web-based system and data from the integrated APPE was compared to previous students from each preceptor from stand-alone AC and IM rotations at the same hospital. Specific comparisons included: number/type of interventions, common drugs and disease states, clinical and economic impact, and acceptance rates. **Results:** Twelve integrated APPE students documented 1984 interventions vs. 873 interventions from 12 students completing separate APPEs with the same preceptors (p <0.001). Intervention categories remained consistent with an increase in medication histories performed (11.5% to 18.3%). Student initiated interventions without preceptor aid also increased (67.6% to 75.9%), which may indicate an increased student confidence level during the integrated APPE. The intervention level of significance also increased in the integrated model. **Implications:** An integrated APPE increases clinical intervention documentation in addition to decreasing orientation time, increasing interactions and promoting stronger relationships with patients, providers and preceptors.

**Enriching a Patient Counseling Activity through Peer Mentoring in a Pharmaceutical Care Lab Setting.** Krista Dominguez-Salazar, The University of New Mexico, Rucha S. Bond, The University of New Mexico. **Objectives:** Curricular goals: 1. Apply feedback from peer mentoring counseling activity to improve individual patient counseling skills 2. Introduce concepts and rewards of peer mentoring. 3. Practice receiving and giving constructive feedback. 4. Foster collaboration between first and third year pharmacy students. **Method:** At the UNM COP, a peer-mentoring activity was implemented to improve patient counseling skills. First (PS1) and third year (PS3) pharmacy students worked in groups of 4 to role play patient counseling. Two students role played while 2 assessed the interaction. Students assessed counseling skills on a rubric and provided/received constructive verbal & written feedback. **Results:** An optional anonymous student survey was administered to evaluate perceived activity usefulness. An average of 95% of the students who participated in the activity responded to the survey. An average of 80% strongly agreed/agreed the activity offered practice giving/receiving constructive feedback. 78% strongly agreed/agreed the activity strengthened awareness of effective counseling. **Implications:** Current literature reflects that peer assisted learning environments foster the development of confidence in all participants. Implementation of PS1 and PS3 collaborative mentoring and learning has a two-fold benefit. 1) PS1s can benefit from the experience of PS3 while PS3 students are reminded of all the skills surrounding patient counseling. 2) Students experience mentoring one another and practice giving/receiving constructive feedback. Peer evaluation in the care lab setting creates an
Evaluation of Electronic SOAP Note Grading and Feedback. Susanne G. Barnett, University of Wisconsin-Madison, Rachel Arftstrom, University of Wisconsin-Madison. Objectives: To evaluate student and professor feedback regarding consistency of SOAP note grading and feedback following Pharmacotherapy Lab changes to SOAP note submission and grading. Method: SOAP note modifications included the transition from paper to electronic submission and feedback. Case-specific rubrics were utilized. Second-, third-, and fourth-year Doctor of Pharmacy (DPh) students, and 52 assessors were invited to participate in an electronic survey. Survey questions used a 10-point Likert-type scale (1 = strongly disagree and 10 = strongly agree). Between group assessments were performed using paired and unpaired t-tests and ANOVA. Results: Thirty-six (26%) DPh-2, 54 (41%) DPh-3, and 44 (33%) DPh-4 students completed the survey. Perceived grading consistency improved between the 2009-2010 academic year and the Fall 2010 semester among DPh-3 students (mean [SD]) (3.1 [2.0], 6.9 [2.0], respectively, p<0.0001). Mean [SD] grading consistency score among DPh-2 students was 4.0 [2.0]. Quality of feedback (positive, constructive) mean scores for DPh-3 students following grading changes were 6.3 [2.4], and 7.2 [1.8], respectively, and for DPh-2 students were 6.1 [2.2] and 6.1 [2.7]. 2009-2010 academic year (n=9) assessor responses were compared to the Fall 2010 semester (n=17). Perceived inter-(p=0.03) and intra-individual (p=0.03) grading consistency improved between the time periods. There was no difference between the two groups in perceived ability to provide sufficient positive (p=0.9) and constructive (p=0.5) feedback following implemented changes. Implications: Revised grading methods allowed for improvements in student and assessor perceived grading consistency and enhanced student-perceived feedback.

Evaluation of Summer Pharmacy Camp as a Recruitment Tool. Renee M. DeHart, University of Arkansas for Medical Sciences, Eddie B. Dunn, University of Arkansas for Medical Sciences, Stephanie F. Gardner, University of Arkansas for Medical Sciences. Objectives: Colleges of Pharmacy strive to recruit quality applicants. Most efforts focus on college students, however recent efforts include younger students. Our institution offers a one-week summer camp for high school students interested in pharmacy. The camp incorporates various experiences: compounding laboratories, practitioner presentations, and field trips to pharmacies. There are few data evaluating whether camp participation translates into continued interest in pharmacy or impacts decisions to apply to Colleges of Pharmacy. This study analyzes college and career plans of 2007-2010 summer camp participants. Method: All camp participants (n=135) were invited to complete a voluntary survey. IRB approval was obtained through our Institutional Review Board. All responders were included and descriptive statistics were used in this analysis. Results: Fifty-four students completed the survey (40% response rate). Students learned about the camp through several mechanisms (33% via internet, 19% via pharmacist, 17% by a teacher/counselor, and 13% by a parent). 94% would recommend pharmacy camp to a friend. Of those responding, 83% either plan to attend or already attend pharmacy school. Specifically, of the 27 students not yet attending college, 24 (89%) plan to apply to pharmacy school. Of the 27 currently attending college, 21 (78%) either plan to apply, already applied, or have been admitted to pharmacy school. Four respondents are enrolled in pharmacy school (2 at our institution). Implications: A pharmacy camp for high school students is an effective program for maintaining student interest in a career in pharmacy. Such programs may facilitate recruitment by further motivating participants to apply to pharmacy school.

Factors in Faculty Retention in a College of Pharmacy. Brooke L. Griffin, Midwestern University’s Chicago College of Pharmacy, Susan R. Winkler, Midwestern University’s Chicago College of Pharmacy, Mary Ann Kliethermes, Midwestern University’s Chicago College of Pharmacy, Carrie A. Sincak, Midwestern University’s Chicago College of Pharmacy, Julie A. Fusco, Midwestern University’s Chicago College of Pharmacy, Jennifer L. Mazan, Midwestern University’s Chicago College of Pharmacy, Margaret Felczak, Midwestern University’s Chicago College of Pharmacy. Objectives: Faculty in higher education, especially colleges of pharmacy, have experienced significant turnover potentially resulting in increased workload. The increase in the number of colleges of pharmacy as well as the number of enrolled students has created significant competition to recruit and retain highly qualified faculty. Changing demographics have also impacted colleges of pharmacy, forcing the profession and colleges to seek innovative measures to address the influence of these changes. The high cost of faculty turnover and the desire to retain faculty members who demonstrate dedication to the Chicago College of Pharmacy (CCP) are reasons to address faculty quality of life, such as alternative work schedules. The objectives of this survey are to evaluate the faculty’s perspective on workload, ideas for adjustments, desire for alternative work schedules, and key drivers to retain current faculty. Method: All CCP faculty in the Department of Pharmacy Practice were asked to participate in the study via completion of a 19-item anonymous questionnaire. Results: Twenty-nine (78%) surveys were returned. Approximately 75% of faculty are interested in an alternative appointment structure and approximately 59% believe it would affect their decision to stay employed with the university. More ambulatory care than acute care faculty desire a decrease in the number of rotation students and days...
Implications: The results of this survey demonstrate faculty perspectives on the balance of professional responsibilities, workload, and retention decisions.

Faculty Perceptions of a Newly Implemented Student E-Portfolio. Terri M. Wensel, Samford University, Michael G. Kendrach, Samford University, Mary R. Monk-Tutor, Samford University, Rachel Slaton, Samford University, Patricia B. Naro, Samford University, Mary A. Worthington, Samford University. Objectives: Describe faculty perception of an e-portfolio system used to document and assess student achievement of curricular outcomes. Method: An online survey was administered to faculty to evaluate their perceptions of mentoring students and grading student e-portfolios. The survey used a Likert scale to rate responses and included opportunity for written comments. Results: Fifty percent (21/42) of faculty responded to the survey. Overall, the majority of faculty agreed the e-portfolio orientation and tutorial materials for the faculty were informative. Most faculty (62%) also agreed the e-portfolio was easy to grade and took 15 to 60 minutes to grade each e-portfolio (52%). After having the e-portfolio in place for only 3 semesters, 52% of faculty felt the e-portfolio provides documentation that students are progressing as expected in the curriculum. Many faculty (66%) believed student reflections represented an honest assessment of individual achievement of overall course goals. The majority of faculty (81%) either did not read or did not recall reading student reflections that revealed negative aspects of the curriculum. Overall, faculty agreed the e-portfolio assisted students in identifying learning goals and achievements (80%) and 66% agreed/strongly agreed the system meets the purpose of a portfolio. A small number of written comments indicated the faculty lack a familiarity with the system and that students may not fully understand the benefits of a portfolio. Implications: Faculty feedback indicated that a new student e-portfolio system was valuable for documentation and assessment of both student learning and the success of a new, partially integrated curriculum.

Faculty’s Perceptions on Selected Teaching Facts and Myths. Therese I. Poirier, Southern Illinois University Edwardsville, Dallas Basinger, Southern Illinois University Edwardsville. Objectives: To identify faculty’s perceptions on selected teaching facts and myths. Method: Forty-two faculty at a School of Pharmacy were surveyed to determine the level of agreement with ten teaching facts and myths statements using a five point Likert scale with 1 = strongly disagree to 5 = strongly agree. These statements were composed based on reflections from Coleen Armstrong’s ‘The Truth about Teaching. What I understand what I am talking about’ [mean = 1.82 (0.769)]. The statement where there was the widest distribution of responses was “good teachers are good performers” with 42.4% agreeing to this statement [mean = 3.21 (0.857)]. 81.8% disagreed with the statement that “the popular teacher is a bad teacher” [mean = 2.09 (0.843)]. 57.6% disagreed with the statement that ‘lecturing is the best way to teach’ [mean = 2.39 (0.747)]. 72.8% disagreed with the statement that ‘good teachers are not made’ [mean = 2.33 (0.854)]. “I don’t need to know my student’s name” [mean = 2.12 (0.960)], and “students don’t want to work together” [mean = 2.27 (0.674)]. Implications: The perceptions of the faculty suggested the need for additional insights which was addressed by distribution of an educational newsletter.

From the Podium to the PC: a Study on Various Modalities of Lecture Delivery. Jason W. Lancaster, Northeastern University, Maureen McQueeny, Northeastern University. Objectives: 1) Evaluate whether or not any difference existed between the overall course grades between three separate course sections: traditional, blended course, and online-only. 2) Evaluate whether or not any difference existed between individual assessment tools, specifically the overall quiz, mid-term and final exam scores, between each section, as well as overall student perception of learning between each section. Method: This retrospective, IRB approved study evaluated student outcomes from a basic pharmacology course taught over three separate semesters using three different lecture delivery modalities: traditional in-class, blended and online. A one-way analysis of variance test with Tukey HSD post-hoc testing was utilized to determine if any statistical difference existed between each of the three sections. A p-value of ≤0.05 was considered to be statistically significant. Results: Overall, students enrolled within the online only lecture delivery section of this course performed statistically significantly better than their counterparts enrolled within the traditional lecture delivery section in each of the studied outcomes; and better than their counterparts within the blended lecture delivery section for all studied outcomes with the exception of the composite score of the first mid-term examination. Implications: We demonstrated that students enrolled within a basic pharmacology course taught via blended or online only modalities do no worse than students enrolled within a traditional lecture delivery course, and in this study, were found to have performed at a higher level than their counterparts enrolled within the traditional lecture style course.

Getting Ready for the Real World: Evaluation of a Post-Rotational P4 Seminar. Rolee Pathak, Rutgers, The State University of New Jersey, Lucio Volino, Rutgers, The State University of New Jersey. Objectives: To assess the impact of a specialized program designed to prepare fourth professional year (P4) pharmacy students for career transitioning. Method: P4 students returned to campus after their 8th cycle of Advance Practice Experiences. As this was the second year of this program design, changes from the initial program assessment were implemented. The program consisted of lecture-style case reviews and small-group sessions focused on various skills/competencies, such as physical assessment and professional communications. Results of an anonymous ten question survey were collected, evaluating individual guest speakers and small section activities as they related to benefit for future pharmacy practice. Results: The response rate was 89% (192/215). The usefulness of small group content was rated as: drug knowledge reinforcement through game shows 87%, review of difficult situations 62%, ethics debate 60%, and patient interviewing/physical assessment case 62%. A large majority (85%) of students found the guest speaker presentation regarding legal issues for practicing pharmacists relevant. Topics regarding pathways to success, medication therapy management, and pharmacy organizations were also considered helpful, with 74%, 68% and 66% agreeing or strongly agreeing to their benefit, respectively. Fewer students agreed to the benefit of discussions regarding immunization practices (33%) and managed care services (50%). Implications: Student feedback from specific sessions demonstrated value in preparation for career transitioning. Annual review of program content by students will help to ensure quality of future post-rotational (P4) seminars.

Health Literacy Education: Changes In Pharmacy Student Abilities Over Two Years. Peter D. Hurd, St. Louis College of Pharmacy, Amy M. Tiemeier, St. Louis College of Pharmacy, Tricia M. Berry, St. Louis College of Pharmacy, Gloria Grice, St. Louis College of
Impact of a Native American Health Care Camp on Native Student Interest in Health Care Professions. Daniel J. Hansen, South Dakota State University, Teresa M. Delfinis, South Dakota State University. Objectives: Evaluate the impact of a health care camp on Native student interest in health care professions. Method: The Wicazani Academy helped seventh grade, American Indian students explore health care careers as well as understand corresponding academic requirements for these career paths. A transcultural approach gave Native students the opportunity to see Native American health care professionals in action in order to build awareness about the important role these health professionals play in the communities they serve. Students completed a survey at the end of the camp to evaluate the impact of this program (Likert scale strongly disagree to strongly agree). Results: Nearly or more than three-fourths of the students felt that the clinical lab sessions helped them see how science, math, and communication skills are critical to a nursing or pharmacy career (87.5%); increase interest in a nursing or pharmacy careers (87.5%); and consider that Native American students can and do have future careers in nursing and pharmacy (75%). All of the students felt they had a better understanding of how Native American and scientific knowledge can work together in health care. Implications: Health care careers specifically targeted toward the Native American population seem to have a positive impact on interest in health care professions.

Impact of a Pharmacist on an Interprofessional Cardiac Rehabilitation Team. Kathleen A. Packard, Creighton University, Megan Herink, Creighton University, Paulette Kulhman, BryanLGH Medical Center. Objectives: This study determined the impact of pharmacist involvement during an interprofessional cardiac rehabilitation program in the outpatient setting. Method: The study included 192 patients who were seen by a pharmacist and pharmacy students at an outpatient cardiac rehabilitation facility following discharge from the acute care hospital between June 2008 and September 2010. The pharmacy team educated patients on their medications, conducted medication reconciliation (MRC), and made patient and provider interventions when appropriate. The pharmacist met with cardiac rehabilitation nurses before and after these sessions to reconcile medication lists and identify areas for follow-up. Results: A total of 467 interventions (including MRC, patient and provider interventions) were made with a mean of 2.43 interventions per patient. MRC interventions not requiring a physician response comprised 79.9% of total interventions. The most common MRC was over the counter medications not listed (18%). In addition, 76 patient interventions and 18 provider interventions were also made. Of these, 92% of the patient interventions were accepted and 72% of the provider interventions were accepted. The most common patient intervention was changing the administration time of a medication (36.8%) and the most common provider intervention was avoidance of a significant drug interaction (33.3%). Implications: Pharmacists can play a vital role in the process of cardiac rehabilitation to ensure proper adherence to cardiac medications and patient safety through patient education and interventions. More studies need to be conducted to quantify the impact of the pharmacist on overall outcomes to further support the effectiveness of this role.

Impact of a Scholarship of Teaching and Learning (SoTL) Workshop on Faculty Perceptions of SoTL. Kathryn M. Momary, Mercer University. Objectives: To assess the impact of a scholarship of teaching and learning (SoTL) workshop, conducted during a faculty retreat, on faculty perceptions of SoTL. Method: A three-hour workshop focused on developing SoTL
Implementing a Sustainable Faculty Training Program for a Two Campus College of Pharmacy. Suzanne M. Rabi, University of Illinois at Chicago, Phil Reiter, University of Illinois at Chicago, Marieke D. Schoen, University of Illinois at Chicago. **Objectives:** To describe the development of a faculty training program and to compare and contrast usage/attendance of various training methods. **Method:** A training program was developed that reached faculty at kinesthetic, visual and auditory levels of learning. Training methods included: 1) flowcharts, 2) organizational charts, 3) live and online programs, 4) one-on-one and group training, 5) IT helpline (telephone), 6) internal peer-based Teaching and Learning “TALK” Website (Teach, Assess, Learn and Know) and 7) monthly written and online newsletter. Attendance was tracked at each session. TALK “hits” and helpline calls were also tracked. Preparations began in 2007; the satellite campus opened in 2010. **Results:** Between 2007 and 2010, 34 live training sessions were conducted. The majority were posted online on the TALK website which also holds flowcharts, organizational charts, course syllabi, training session information, slide templates, distance education tips and more. Since 2009, >500 hits occurred on the TALK site, 12 newsletters have been distributed and >45 one-on-one training sessions occurred. As faculty were trained, the use of the IT helpline decreased significantly. Based on attendance lists, it appeared that the live training sessions were attended and online sites were accessed by similar faculty members, respectively. **Implications:** The use of various training techniques was beneficial for faculty development. The innovative TALK website, newsletter and helpline appeared useful for faculty training. There are less classroom interruptions with IT helpline calls and more interaction between faculty and students when faculty are properly trained.

Implementing an Interprofessional Education Course in HIV: A 2-year Experience in the University of Texas System. Veronica S. Young, The University of Texas at Austin, Delia Bullock, University of Texas Health Science Center at San Antonio, Maureen Rubin, University of Texas at San Antonio, Ruben Restrepo, University of Texas Health Science Center at San Antonio, John Herbold, University of Texas Health Science Center at Houston, Anrutha Parekh, University of Texas Health Science Center at San Antonio, Leticia Bresnahan, University of Texas Health Science Center at San Antonio,
Incident Coronary Atherosclerosis in Type 2 Diabetes: Is Mean Glycated Hemoglobin a Good Predictor? Yaw Owusu, University of Hawaii at Hilo, Jamie C. Barner, The University of Texas at Austin, Kenneth A. Lawson, The University of Texas at Austin, Debra Lopez, The University of Texas at Austin, Jason Jokerst, CommunityCare.

Objectives: To determine the association between glycated hemoglobin (HbA1C) and incident coronary atherosclerosis (CA) or acute coronary syndromes (ACS) in type 2 diabetic (T2DM) patients controlling for age, gender, hypertension, LDL-C, microalbuminuria, aspirin use, statin use, insulin use, tobacco use, and BMI.

Method: A retrospective cohort database analysis using the Austin Travis County CommUnityCareTM clinics’ electronic medical record between October 1, 2004 and September 30, 2009. The primary outcome was the incidence of coronary atherosclerosis or acute coronary syndromes and the primary independent variable was HbA1C (<7% vs. >=7%). Subjects included T2DM patients aged 30 to 80 years with at least one HbA1C value per year for a minimum of two consecutive years. Subjects were excluded if CA or ACS occurred within six months of the index date. Logistic regression analysis was used to analyze the data.

Results: 3069 subjects met the study inclusion criteria. Two percent (N=62) had incident CA or ACS. After controlling for covariates, there was no significant association (OR=1.026, 95% CI=0.589-1.785, p=0.9289) between HbA1C and the incident diagnosis of CA or ACS. Increasing age (OR=1.051, 95% CI=1.025-1.077, p<0.0001), male gender (OR=1.855, 95% CI=1.105-3.115, p=0.0195) and normal weight (normal or underweight compared to obese: OR=0.122, 95% CI=0.017-0.895, p=0.0438) were significantly associated with incident CA or ACS.

Implications: HbA1C was not significantly associated with CA or ACS. Until more evidence becomes available, clinicians should target HbA1C below or close to 7 percent soon after diagnosis while controlling risk factors of cardiovascular disease to reduce long-term risk of incident CA or ACS.

Influence of Educational Debt on Early Health Professionals’ Employment Decisions. Diana Vinh, West Virginia University, Michael D. Newton, West Virginia University, Thomas Hogan, West Virginia University, Michael Meador, West Virginia University, Hollynn Larrabee, West Virginia University.

Objectives: 1. Describe demographics of health professional students and residents. 2. Define estimated debt burden of health professional students and residents. 3. Characterize post-graduation career plans of health professional students and residents. Method: An online survey was distributed to all students and residents in the professional programs at an academic Health Sciences Center (HSC). This included students enrolled in the Schools of Dentistry, Medicine, Nursing, and Pharmacy as well as the affiliated hospital’s medical residents. Survey questions were constructed to characterize student demographics, education-related debt, and post-graduation employment plans. Participation in the survey was voluntary, and all responses were anonymous and analyzed in aggregate. Standard descriptive statistical methods were used. The study obtained exempt status from the Institutional Review Board.

Results: Total enrollment at HSC professional schools was 1,698 at the time of the study. The survey elicited responses from 286 (16.8%) student and resident professionals. Representation of this sample included 37% Medicine, 31% Pharmacy, 12% Nursing, 11% medical residents, and 9% Dentistry. Two hundred twenty eight individuals responded to questions regarding educational debt levels. Fifty three percent reported debt levels to be over $100,000 upon graduation. Regarding whether “educational debt would influence career decisions after graduation,” 58% of respondents reported that there was a moderate- to-high probability that debt would influence their career decisions.

Implications: The results of this survey study indicate that many health professional students will graduate with substantial
Influenza Vaccination Outreach on a Health-sciences Center Campus. Tracy M. Hagemann, The University of Oklahoma, Susan E. Conway, The University of Oklahoma, Eric J. Johnson, The University of Oklahoma. Objectives: To design, implement and assess an influenza vaccination program for health-care workers on a health sciences center. Method: Due to budgets cuts, Employee Health at our health sciences center did not provide influenza vaccinations for fall 2010. Because no other arrangements were made, we designed a month-long campus campaign focused on influenza prevention and influenza vaccination to all faculty and staff. A health insurance provider covered vaccine costs. Vaccines were offered at 11 campus locations. Pharmacy faculty, staff and students conducted the clinics. Posters described the importance of health care worker influenza vaccination and information about pharmacists as immunization providers. Vaccine recipients were asked to complete a short survey assessing satisfaction with their experience. Results: A total 2309 vaccines were administered in October 2010, an increase over the previous year. Each site averaged approximately 200 vaccines administered per site. The survey had a 70% response rate. Overall, 50% were not familiar with Oklahoma pharmacist’s ability to vaccinate. Vaccine ratings were overwhelmingly positive with 97% rating as “good” or “excellent”. The overall clinic experience ratings were positive with 99% giving a “good” or “excellent” rating. Major themes of write-in comments included convenience and multiple locations and days to receive the flu vaccine. Implications: Our campaign was successful and met our goals of improving access to influenza vaccination for our health care workers. Efforts to educate on influenza vaccination and pharmacists as vaccinators continue.

Interactive Approach to Educate Older Adults on the Safe Use of Over-the-counter (OTC) Medications. Jeanne K. Lee, The University of Arizona, Lindsey B. Burgin, The University of Arizona, Ana M. Gamboa, The University of Arizona, Danielle M. Tierney, The University of Arizona. Objectives: The objective of this study was to create, implement, and evaluate an interactive educational program for older adults on the safe use of over-the-counter (OTC) medications. Method: This was a prospective, interventional study in which all subjects received a 40-minute session covering 12 OTC topics tailored to older adults and delivered by pharmacy students. Convenience sampling was used to recruit participants from five independent senior living communities in Arizona. Following the program, participants completed a questionnaire to address the helpfulness and share their intentions of behavior change. Results: Of 88 older adults who attended the program, 64 met the inclusion criteria and voluntarily completed the anonymous survey. 91.8% of the participants indicated the intervention was either “very helpful” or “moderately helpful”. Upon score conversion, the average score for helpfulness among men and women were 2.35 and 2.37, respectively (p=0.922). 95.2% of the participants agreed they have better understanding about OTCs, and 98.3% reported they would recommend this program to a friend. The majority of the subjects stated they will make changes to the way they use OTCs (79.3%), talk with their pharmacist before purchasing OTCs (86.8%), and discuss OTC use with their providers (88.3%). The three most beneficial topics identified included vitamins/minerals, reading a drug label, and sleep medications. Implications: An interactive educational program on the safe use of OTC medications, tailored to older adults and delivered by pharmacy students, was helpful and generated positive intentions regarding behavior change in OTC use among participants.

Interprofessional Patient Safety Day for Health Professions Students. Kimberly A. Galt, Creighton University, Cindy Costanzo, Creighton University School of Nursing, Kevin Fuji, Creighton University, Amy Abbott, Creighton University School of Nursing, Kathryn Huggett, Creighton University School of Medicine, Thomas Hansen, Creighton University School of Medicine, Maribeth Hercinger, Creighton University School of Nursing. Objectives: To provide students with an introduction to basic patient safety science principles in an interprofessional framework for educational delivery. Method: A one-day interprofessional patient safety day was held that involved 181 students from pharmacy (n=45), medicine (n=36), nursing (n=46), physical therapy (n=28), occupational therapy (n=18), and social work (n=8). The day promoted interprofessional student interaction in groups; facilitating a greater understanding and appreciation for the roles and responsibilities of each profession in safe patient care. Topics included human factors, systems approaches to safety, and interprofessional teamwork. Student learning was assessed through reflective questions answered after each session and a post-event questionnaire. Results: The large majority of students felt that patient safety education should be required for all health professions students (75%), and the material presented was essential core knowledge (75%). Students felt the content was best taught in an interdisciplinary course and integrated into their professional curriculum (43%) or as a one-day interprofessional seminar added to their current professional curriculum (33%). Twenty-four percent of participants felt the material was best taught through integration into their current professional curriculum without the involvement of other disciplines. Implications: Patient safety education is valued by most students. Students recognize the need for interprofessional dialogue and collaboration during learning about patient safety and prefer to learn the content in an interdisciplinary model. There is a need to develop an interdisciplinary mechanism for delivery of patient safety content to health professions students.

Introduction of Team Based Learning to Distance Pharmacy Students in a Literature Evaluation Course. Zara Risoldi Cochrane, Creighton University, Amy Friedman Wilson, Creighton University, Philip J. Gregory, Creighton University, Beverly A. Lukawski, Creighton University. Objectives: Team-based learning (TBL) has been shown to enhance pharmacy students’ learning as well as professionalism. However, TBL has not, to our knowledge, been previously investigated in a web-based distance pharmacy pathway. Our objective was to assess the effect of TBL activities on third-year distance pharmacy students’ perceptions of teamwork and their confidence in drug information-related skills. Method: An anonymous, voluntary survey was sent to third-year Creighton University pharmacy students in the web-based distance pathway during their enrollment in a literature evaluation course. At the beginning and end of the semester, students were asked to respond to identical survey questions using a 5-point Likert scale. Throughout the semester, five TBL activities, designed to supplement material presented in didactic lectures, were administered using online conferencing software and the course website. Results: Fifty-five students completed the pre-survey; 29 students (representing 54.7% of the class) responded to the post-survey. Before completing TBL activities, 51.9% of third-year distance pharmacy students felt that teamwork was an effective or very effective mechanism for promoting understanding and retention of information. This increased to 75.9% at the semester’s end. With respect to presenting information to faculty and peers, the proportion of students who felt confident or very confident at this task increased from 27.3% to 69%. Finally, the proportion of students who felt confident at using electronic tertiary drug information resources increased from 69.1% to 96.9%.
Implications: TBL is an effective mechanism for increasing web-based distance pharmacy students’ confidence in completing course-related tasks and could be incorporated throughout the curriculum.

Introduction of an Integrative Medication (IM) Elective at the UNC Eshelman School of Pharmacy (ESOP). Amanda H. Corbett, University of North Carolina at Chapel Hill, Dennis M. Williams, University of North Carolina at Chapel Hill. Objectives: To develop a novel elective course in IM at the ESOP for doctor of pharmacy students. Method: Faculty worked with a physician who managed an integrative medicine practice to develop the course. Speakers were asked to provide background on their experience and training; describe history, theory, and evidence support for the practice; and discuss clinically relevant examples for pharmacy students. Students were instructed to develop 2 videos, perform a review of evidence for a CAM therapy, and write a proposal for a clinical trial evaluating a complementary and alternative medication (CAM). Grading was based on these activities, 2 exams, and class participation. Results: Eight students enrolled with 13 speakers over 16 weeks in the Fall of 2010. Topics included chiropractic care, acupuncture, massage therapy, herbal products, naturopathic and homeopathic medicine, energy medicine, giong, bioidentical hormones, and medication compounding for alternative therapies. Students completed surveys on their perceptions of the topics presented prior to and following each topic discussion, as well as before and after the course. Videos were developed about counseling patients regarding CAM therapies and immersion experiences of a chosen CAM therapy. It was evident from the regular student feedback that the discussions enlightened the students on the role of CAM in integrative medicine. Students gained a positive perception of IM and planned to incorporate IM into their practices. Implications: The course was successful at meeting students needs. Regular feedback and active learning exercises were critical components in evaluating the course and serving as a tool for improvement.

Keller’s Personalized System of Instruction in a Pharmacy Calculations Course: A Crossover Trial Examining Learning Outcomes. Kenneth L. McCall, University of New England, Matthew Lacroix, University of New England, David S. Fike, University of the Incarnate Word. Objectives: To compare learning outcomes as measured by exam scores in a pharmacy calculations course between students who are randomly assigned to Keller’s personalized system of instruction or a control group. Method: The Pharmacy Calculations course was designed with 10 learning modules; equally divided before and after the midterm. Students were randomly assigned (1:1) at the beginning of the semester to the Keller method or a control group. Students continued in the group they were assigned until the midterm exam at which time they crossed over into the other learning method. Baseline, midterm, and final exam scores were compared between groups. Results: Baseline (38.7 ± 13.2%, 39.9 ± 13.8%), midterm (90.3 ± 8.1% and 91.8 ± 5.9%), and final exam (87.7 ± 10.4% and 90.5 ± 7.3%) scores were not significantly different between groups. The mean preference on a 10-point scale for the Keller method and the control method was (8.7 vs 4.2, p<0.001). Implications: Learning outcomes as measured by exam scores were similar between groups in a calculations course. At the conclusion of the course, students significantly preferred the Keller method of learning compared to the control method.

Lifetime Publication Records of Basic Science Faculty in Research-Intensive Colleges of Pharmacy. Dennis F. Thompson, Southwestern Oklahoma State University, Chelsea O. Church, Southwestern Oklahoma State University. Objectives: Bibliometrics is a useful method to benchmark scholarship metrics. The purpose of this project was to determine lifetime publication records of basic science faculty in research-intensive colleges of pharmacy. Method: Basic science faculty from research-intensive colleges of pharmacy were searched for their publication records on Web of Science. A stratified random sample of 120 faculty were chosen from the AACP Roster (2005-2009). The Soler FILTER program was used to remove homologues and the Soler MERIT program was used to generate bibliometric indices (h-index, productivity, creativity, m-quotient, etc.). Data were analyzed by the Kruskal-Wallis test with the Bonferroni post-hoc analysis. Results: Mean lifetime publications = 52 (range 0-370). Mean lifetime h-index = 13.5 (range 0-55). Bibliometric indices were highest for medicinal chemistry (MC) and pharmaceutics (PT) with pharmacology (PC) third and pharmacy administration (PA) fourth. In general, bibliometric indices were greater for MC, PT, and PC over PA (p<0.0001). Bibliometric parameters also differed significantly between academic ranks. The h-index parameters for professors, associate professors, and assistant professors were 21, 12.5, and 7, respectively (p<0.01). Implications: Significant differences exist in lifetime publication rates and scientific impact between basic science disciplines and academic ranks within research-intensive colleges of pharmacy.

National Database Learning Modules and Course Management System Bridging Online Learning in Pharmacognosy Course. Martha H. Carle, University of Arkansas for Medical Sciences, Daniel C. Spadaro, University of Arkansas Medical Sciences. Objectives: The addition of a satellite campus and increased online course offerings has challenged faculty to investigate new methods of content delivery. A required, third year Pharmacognosy course including the therapeutics of natural products was revised by utilizing material from a national database website and organized into the college’s course management system (CMS). Method: After a short demonstration, students were required to access and read database articles, and answer the questions that were dispersed throughout the articles. Students were required to pass the online quiz with a 70% plus. Questions or case studies were developed to go along with each learning module where the students developed research skills using the articles, resources from the site, and links from database. The students were monitored on 10 topics and assessed using the built in website technology. Results were transferred to the CMS. Results: Survey results indicated that students found relevance in the database and website material. Students reported that the content was well covered and they were satisfied with the online portions of the course. Students reported an average of 30 to 45 minutes spent per topic. Average score for the modules was 94.2. Implications: The national database materials and website provided 24/7 access to up-to-date drug and dosage comparison charts; evidence-based drug information; case-based teaching; and problem-based resources. The modules were easily integrated into the CMS with assessment and performance data. The online modules freed lecture class time for discussions and case based problem solving.

Patient Satisfaction and Beliefs Regarding Mandatory Counseling for Prescription Medications in North Carolina Community Pharmacies. Richard A. DeBenedetto, Campbell University, Caroline Preas Siemer, Campbell University, Ashley Ward, Campbell University, Tina Tseng, Campbell University, Wesley D. Rich, Campbell University, Robert M. Cisneros, Campbell University. Objectives: To determine if there is an association between patient satisfaction with their pharmacy and support of a mandatory counseling rule in North Carolina and to identify significant predictors of patient support of mandatory counseling in North Carolina. Method:
A prospective, cross-sectional, pilot study surveyed 248 North Carolina residents. A 33 question survey was collected from subjects at retail establishments, churches and universities to assess support for mandatory counseling compared to satisfaction with their pharmacy. Endpoints were analyzed using Chi-square analyses and multivariate logistic regression. Results: Overall 68.7% of 248 participants supported mandatory counseling. There was no association between patient satisfaction and support for mandatory counseling (p>0.05). Demographic analysis concluded that respondents ages 18 to 30 were almost twice as likely to support mandatory counseling (OR: 1.919, CI: 1.025-3.594), whereas those with graduate degrees were half as likely (OR: 0.55, CI: 0.330-0.92) and patrons with 5 or more prescriptions were 0.61 less likely (OR: 0.608, CI: 0.378-0.978) to support mandatory counseling. Implications: This pilot study identified patient subgroups preferring additional counseling and services. The study also demonstrated North Carolina residents support a mandatory counseling rule. However, additional studies are required to determine how effective mandatory counseling policies could be enacted.

Pediatric Pharmacotherapy Elective: Discussions, Case Presentations, Experiential Learning, and Writing to Improve Knowledge and Confidence. Gary Milavetz, The University of Iowa, Susan S. Vos, The University of Iowa. Objectives: To broaden students’ understanding of pediatrics through an innovative elective course combining didactic and experiential learning. Method: Students were expected to actively participate in discussion groups, provide a case presentation, visit one pediatric practice setting, and participate in a team-written manuscript on a pediatric topic. Topics for discussion were selected beyond the typical areas of pediatric pharmacy including FDA issues, research, growth and development, medication errors and patient counseling with role-play. Maximum enrollment in the course was 15 third year student pharmacists. Students’ completed five knowledge based questions and rated their confidence in five realms (1 = very confident, 5 = not at all confident) pre and post course. Pre and post responses were compared via simple unpaired t-test for knowledge and mode for confidence realms. Results: Thirteen student pharmacists enrolled in the course and completed the pre-test. Pre-test knowledge questions ranged from 5 correct answers to 1 correct (mean 3). Twelve students completed the post-test; 11 scoring 5 correct and 1 scoring 4 correct. This improvement was statistically significant (p<0.001). The pre-course confidence mode for all questions by all students was 3, which improved to 2 post-course. Implications: A small group, discussion-based elective course improved student’s knowledge and confidence in pediatric pharmacy.

Performance Comparison of Evidence-Based Practice and Literature Evaluation Skills in Distance and Campus Pharmacy Pathways. Amy Friedman Wilson, Creighton University; Zara Risoldi Cochrane, Creighton University; Philip J. Gregory, Creighton University; Beverly A. Lukawski, Creighton University. Objectives: Interactive discussions are an integral part of teaching and learning evidence-based practice and literature evaluation skills. This interaction can be challenging in the context of a distance environment. A mandatory course in this area is taught during the third professional year of the pharmacy curriculum at Creighton University. Several “journal club” discussions are held to develop the skills for critically evaluating biomedical literature. Campus students complete these discussions in small groups during class time; distance pathway students participate in small groups via online conferencing software. Discussions are moderated by a faculty member or mentor. The purpose of this study is to compare objective measurements of the skills taught during this course, and identify any differences in performance between the campus- and distance-based students. Method: Following completion of the module on critically analyzing literature, an identical performance assessment was administered to both groups of students. All students completed the assessment utilizing online exam software. Results: 51 students in the campus pathway and 52 students in the distance pathway completed the online assessment. Overall results were identical, with scores ranging from 46.2% to 100% in both pathways. Mean and median scores for both groups were 75.7% and 76.9%, respectively. The campus students completed the assessment in an average of 33 minutes; the distance students completed in an average of 39 minutes. Implications: Interactive online discussion groups are an effective way for developing literature evaluation skills, as evidenced by identical assessment scores between campus and distance students.

Personal Values, Professional Knowledge and Ethical Dilemmas in Hospice and Palliative Care. Doreen Pon, Western University of Health Sciences. Objectives: To determine factors influencing the ability of student pharmacists to resolve ethical dilemmas in hospice and palliative care (HPC) before and after a day-long didactic course in HPC. Method: 133 third year students enrolled in a course that included topics related to HPC were asked to complete an anonymous survey that included questions regarding their beliefs and knowledge about HPC and ethical dilemmas in HPC at the start (pre-intervention) and completion (post-intervention) of the course. Results: Students were significantly more confident they could explain the meaning of terms such as hospice, palliative care, euthanasia and physician-assisted suicide (PAS) post-intervention. Students born in the U.S. (USB) expressed significantly more confidence in being able to explain those terms post-intervention than students living in the U.S. ≤ 10 years (LT10). Students’ abilities to recognize key concepts related to PAS and euthanasia improved post-intervention and did not significantly differ between USB and LT10. Students’ personal willingness to participate in ethical dilemmas, such as passive withdrawal of care (PWC), did not significantly change post-intervention. When given case scenarios, significantly more students were confident that PWC was medically ethical post-intervention. 43% of students, however, remained unconfident and students aged 20-25 were significantly less confident than students aged 26-30. Implications: Many students, and particularly younger students, expressed reservations about the ethics of PWC and indicated an unwillingness to participate. Course curriculum will be implemented to help students increase confidence in their abilities to resolve ethical dilemmas in HPC.

Personalized Patient Counseling Effects on Medication Adherence. Jamie L. McConaha, Drexel University, Kevin J. Lynch, Pfizer, Inc.. Objectives: To determine the effects of the Day 1 Therapy Counseling program on patient medication adherence rates in a community pharmacy setting. Method: A retrospective review was conducted of two locations of a regional chain grocery store pharmacy that were chosen to pilot a new personalized counseling program entitled Day 1 Therapy Counseling. Through this program, patients presenting with new prescriptions, transfers, or changes in dosage were flagged to receive counseling by the pharmacist or student pharmacist. The stores chosen also had the assistance of a shared faculty member and experiential pharmacy students. Data collected from the counseling sessions that occurred between 8/2009 and 11/2010 included time spent counseling, medication accuracy, patient satisfaction, and additional comments. The program was tracked weekly to determine the percentage of prescriptions eligible for the
program and those that received counseling. This analysis focused on the medication adherence to ACEIs/ARBs and statins. These medication classes were selected based on the prescription volume in the stores identified and their evidence in improving patient outcomes in diabetic patients. Both pharmacies chosen had at least one diabetes-certified pharmacist. Primary outcomes included proportion of days covered (PDC) at 6 months and persistence to therapy as measured by iDNA® software. Results: Preliminary data included 6916 patients. Mean PDC for ACEI/ARBs was 71% and persistence was 41% and mean PDC for statins was 65% and persistence was 33%. Implications: Medication adherence still remains a challenge, despite implementing programs intended for improvement. A multifaceted approach may be necessary to improve adherence.

Pharmacy Pipeline Programs as Student Recruitment Tools. Kristan E. Vollman, University of Kentucky, Stephanie Wurth, University of Kentucky, Kelly M. Smith, University of Kentucky. Objectives: The expansion of pharmacy schools has made recruiting students, particularly those from under-represented or majority populations, more competitive. Other disciplines have employed career development (pipeline) programs to meet this challenge. We conducted an environmental scan to describe the extent and nature of pharmacy-specific career pipelines as student recruitment tools. Method: The website of each accredited PharmD program (www.acpe-accredit.org) in September 2010 was reviewed. Pharmacy-related pipeline programs noted on either the college or sponsoring institution’s (e.g., university) website were characterized by audience targeted, application elements and program components. Programs not specific to the pharmacy profession were excluded. Results: Of 120 US Colleges of Pharmacy, 19 (16%) employed pharmacy pipeline programs. High school students were the primary population targeted (17, 89%). Applications were needed for enrollment in 13 (68%) programs, with 9 (47%) requiring a letter of recommendation. Seven (19%) had a minimum GPA requirement for eligibility, the mean of which was 2.86 (4.0 scale). The most common program components were hands-on activities (14, 74%), panel discussions with students or practitioners (13, 68%) and shadowing experiences (9, 47%). Most programs (10, 52%) were shorter than seven days, with 5 (26%) exceeding 1 month. The presence or absence of a program fee was noted on 9 (47%) websites; 6 (32%) charged an average fee of $218, while 3 (16%) had no fees. Implications: While program effectiveness was not assessed, these results may inform the efforts of organizations developing a pipeline program.

Photovoice Methodology to Assess Learning During an International Mission-Based Advanced Pharmacy Practice Experience. Amy B. Werremeyer, North Dakota State University, Elizabeth Skoy, North Dakota State University. Objectives: To document and assess student learning during an international medical mission-based Advance Pharmacy Practice Experience (APPE) by placing cameras in the hands of the learners to enable them to act as recorders. Method: Two fourth-year pharmacy students enrolled in the Guatemala international medical mission. The students spent ten days in Guatemala providing pharmacy services as part of a medical mission team. Each student was provided with a twenty-four exposure disposable camera prior to departure and were asked to photograph what they learned about culture’s influence on medication use, how learning in this environment was different from a traditional classroom setting, and images related to their learning experience. Upon returning to the United States, students used the SHOWEd technique to reflect with the APPE preceptors. Themes were drawn from photos, written and oral reflections using a qualitative methodology. Results: Students one and two captured 14 and 24 photos, respectively. Themes that emerged in the students’ reflections included poor sanitary conditions contribute to the disease burden, creativity in communication and use of available work environment positively impact a pharmacist’s care, and interdisciplinary teamwork is imperative in providing quality patient care. Students recognized the importance of the images and reflection when documenting their learning experience. Implications: This study suggests Photovoice represents a viable and powerful methodology for documentation and description of pharmacy student learning on an APPE. This methodology also lends itself very well to a unique learning environment, abstract principles, and attitudes in which assessment of learning through traditional methods may be difficult.

Pre-Admissions Writing Samples as a Predictor of Academic Success of First-Year Pharmacy Students. Melissa A. DeLeon, Nicole C. Farrell, University of the Incarnate Word, Carmita A. Coleman, University of the Incarnate Word, Mark C. Granberry, University of the Incarnate Word. Objectives: Most colleges of pharmacy evaluate writing during their admission process. This study was conducted to determine: (i) if prepared or spontaneous writing samples provide better prediction of success in the professional curriculum; (ii) if the difference between writing samples serves as an indicator of success. Method: The scores of the personal mission statements, spontaneous writing samples and grades awarded during the first professional year were collected for classes admitted from 2006 to 2009. Overall 366 student records were included in the final analysis. Writing samples were scored on a 5-point scale in 5 areas by 2 reviewers (maximum score 25). Students were classified into 2 groups, those with or without a course failure (unsuccesful vs. successful). Average scores of both writing samples for each group were analyzed. In addition, within the 2 groups, individual scores obtained from the 2 writing samples were subtracted and averaged. T-tests were used to determine if statistical differences existed between the 2 groups. Alpha was set at 0.05. Results: The mean score of the personal mission statements for the successful students was 20.77 vs. 21.36 for the unsuccessful students (p = 0.226). The mean score of the spontaneous writing samples for the successful students was 19.13 vs. 19.04 for the unsuccessful students (p = 0.869). The mean difference in the writing samples for the successful students was -0.64 vs. -2.32 for the unsuccessful students (p = 0.396). Implications: Neither of the writing samples nor the difference in scores was a predictor of success in the first professional year.

Preceptor Survey to Plan for a Required First Year Self-Care Course in a New Curriculum. Laura M. Traynor, Concordia University Wisconsin, Michael C. Brown, Concordia University Wisconsin, Andrew P. Traynor, Concordia University Wisconsin. Objectives: To use information from a preceptor survey to shape the knowledge and skills that will be taught in a new self-care course. Method: Concordia University Wisconsin School of Pharmacy had its first offering of a required, 2-credit self-care course for P1 students in spring of 2011. Community pharmacists interested in involvement with the Concordia University Wisconsin School of Pharmacy Experimental Education Program were sent an online survey related to knowledge and skills pharmacists need to assist patients with choosing appropriate self-care therapies. Responses were aggregated into a score of 0 to 4 based on the proportion of preceptors who ranked each topic as “frequent” (0 to 2 points) or “important” (0 to 2 points). Next, a scoring process was created that combined this preceptor input with published recommendations and curricular sequencing. This “emphasis score”

could range from 0 to 7. This scoring system provided a relative rank of topics to guide their inclusion in the course. Results: Fifty-three surveys were submitted by preceptors. Emphasis scores ranged from 3 to 7. More than 75% of preceptors considered pain/fever, cough/cold, allergies, decongestants, and vitamins/calcium supplements to be both frequently encountered and important self-care topics. Four areas: cough/cold, allergies, decongestants, and vitamins/calcium supplements received the highest possible emphasis score of 7. Implications: The results of this process helped to guide the creation of the topic list for the self-care course. An end-of-semester review of the process and its success will determine its application in subsequent pharmacotherapy offerings.

Predictors of Unsatisfactory Grades in Pre-pharmacy and Professional Program Courses. Karen L. Hardinger-Braun, University of Missouri-Kansas City, Stephanie Schauner, University of Missouri-Kansas City, Wayne M. Brown, University of Missouri-Kansas City, Maqual R. Graham, University of Missouri-Kansas City, Shelly M. Janasz, University of Missouri-Kansas City, Linda S. Garavalia, University of Missouri-Kansas City. Objectives: Professional degree programs maintain rigorous standards for academic performance. Programs frequently limit the number of Ds and Fs students may earn. In this study, we investigated predictors of low grades and their associated courses. Method: A retrospective review of students accepted at University of Missouri-Kansas City School of Pharmacy from 2000-2009 was conducted (n = 1,019). Students earning a D or less in courses were identified. Factors analyzed included PCAT scores, pre-pharmacy course hours, GPA, pre-pharmacy science/math hours, leadership, writing ability and interview skills. Additionally, ACT scores, high school GPA, and science/math units were examined for provisional students. Results: A total of 403 grades of D or less were earned by 183 students. For traditional students (1-5) receiving a poor grade was associated with all PCAT subcategory scores, the composite PCAT score, cumulative pre-pharmacy coursework hours, pre-pharmacy coursework GPA, science and math GPA, and interview scores. Pre-pharmacy GPA was not associated with receiving a D or less. For provisional students (0-6), PCAT-QA, PCAT-C, overall GPA, interview, science/maths GPA, English ACT and composite ACT were associated with receiving a D or F. The most common courses in which students earned low grades were Cellular Biology (5%), Physiology (5%), Biochemistry I (5%), Organic Chemistry I (2%), Organic Chemistry II (2%) and Pharmacology I (2%). Implications: Professional programs should pay particular attention to students’ grades on pre-pharmacy science courses when making admissions decisions. If these courses are included in a program, students may need extra support for optimal achievement.

Preparing for Competency Using Critical Thinking Principles: Self-Directed E-Course Links Learning Objectives, Design and Assessment. Debra Sibbald, University of Toronto. Objectives: Graduating pharmacy students must meet standards directed towards patient safety, professional development and contributing to communities of practice. A self-directed E-course was created based on established principles of critical thinking to facilitate progress in literature appraisal, content acquisition, meta-cognitive reflection, and assessment. Method: Final year students completed a three-component E-course, focusing on one practice topic. They critically assessed the literature; generated a lesson plan linking learning objectives, question design and assessment; and created an interactive, integrated E-case. The format presented multiple-choice options and feedback regarding knowledge and performance abilities. An exit E-survey was submitted one month later at the commencement of experiential rotations. It evaluated critical thinking principles and perceptions regarding skills development and preparation for competency standards. Results: Students reported acquisition of critical thinking principles measured via Likert scales (AVG 4.5/5). Comments highlighted improvements in learning approaches, enhanced responsibility for individual and community learning, and increased skill and confidence. They felt elements of key competency standards were achieved. Implications: Participants recognized assuming responsibility for learning goals and outcomes enhanced motivation and critical thinking; and enabled student agency and peer teaching. The impact and value of the course design were judged important for addressing practice standards related to patient safety, self-regulation, maintenance of competency and inter-professional education; and are transferable to other contexts.

Provider Satisfaction with Collaborative Pharmacy Services Offered in an Academic Department of Family Medicine. Daniel Newsom, The University of Louisiana at Monroe, Jeffery D. Evans, The University of Louisiana at Monroe, Emily M. Weidman-Evans, The University of Louisiana at Monroe. Objectives: Primary objective was to determine the level of satisfaction of the providers within the Department regarding established collaborative pharmacy services, as well as the involvement of Pharm.D. students. Secondary objective was to determine reasons for non-satisfaction and non-referrals. Method: An electronic survey was developed and a link sent to all providers within the Department. Included were questions assessing whether or not the providers had referred patients to any of the collaborative pharmacy services, their level of satisfaction with the services (Likert-type scale), and reasons for non-referral, where applicable. Comments or suggestions related to each service were requested. In addition, providers’ satisfaction with the knowledge and professionalism of the students completing their APPEs at this

60

Results: 17 of 46 providers responded to the survey. 15 had referred patients to the MTM clinic and 13 had referred patients to the insulin titration by phone service. All were either “Very satisfied” or “Satisfied” with these services. Reasons for non-referral to both of these services included not being aware of the service or not having had appropriate patients for referral. 14 providers had interacted with students in various settings, and all were either “Very satisfied” or “Satisfied” with the level of knowledge and professionalism of the students. No suggestions for improving the role of the students were provided. Implications: These results demonstrate a high level of satisfaction with the currently offered pharmacy collaborative services at this institution. Further exploration of characteristics contributing to these positive perceptions should be considered.

Rankings of Colleges of Pharmacy Based on Perception, Research, Teaching, and Value. Dennis F. Thompson, Southwestern Oklahoma State University, Mark A. Gales, Southwestern Oklahoma State University. Objectives: US News and World Report periodically publishes rankings of Colleges of Pharmacy. This ranking is limited to perception of excellence by peer institutions. The purpose of this project was to utilize four currently available criteria to rank existing Colleges of Pharmacy. Method: NABPLEX pass rates were utilized to measure teaching; total tuition and fees were utilized as a measure of value; US News and World Report rankings were used to measure perception; and National Institutes of Health funding normalized by full-time equivalent Ph.D., faculty was utilized to measure research (data available from the AACP web site). Results: College of Pharmacy rankings vary greatly based on the parameters measured. Rankings were calculated based on the mean of combined parameters. For the combination of perception, research, teaching and value the University of North Carolina was ranked highest. The University of Wisconsin ranked highest for the combination of research, teaching and value. The University of California - San Francisco ranked highest for the combination of research and teaching. The University of Montana ranked highest for the combination of research and value and South Dakota State University ranked highest for the combination of teaching and value. Additional ranking analysis was performed for public, private, research-intensive and teaching-intensive categories. Correlation analysis was performed on the utilized measures with perception and research being most strongly correlated (R = 0.492); while all other correlations were very weak (R < 0.12). Implications: Rankings of Colleges of Pharmacy are highly dependent upon the parameters evaluated.

Results of a Team-Based Learning/Traditional Lecture Model in a Self-Care Therapeutics Course. Megan E. Thompson, The University of New Mexico. Objectives: The objective of this project was to measure student acceptance of a combination of Team-Based Learning (TBL) and traditional lectures in a Self-Care Therapeutics course. Method: The 3-credit-hour, stand-alone Self-Care Therapeutics course for PS-2 students was used for this project. Team-Based Learning activities were separated into blocks throughout the course and included the use of self-directed study, Individual Readiness Assurance Tests, Team Readiness Assurance Tests, and application exercises. Traditional lecture activities included PowerPoint presentations, audience response participation, and case reviews. Student assessments included individual exams and a final exam. Student scores from the hybrid course were compared to those from the most recent (2009) traditional course. Both groups had the same final exam. At mid-semester, students were asked “Would you like the TBL method to be utilized in more of your classes?” Results: Individual exam averages were higher during the semester when the hybrid TBL/traditional method was utilized. Final exam performance was comparable. The overall course average in 2009 was 87%; in 2010 it was 91%. In response to the mid-semester survey, 55% of the students responded “Yes,” 29% responded “No,” and 15% responded “Maybe.” Implications: Based on positive student attitude toward the Team-Based Learning methods, perhaps TBL can be incorporated into more courses throughout the curriculum.

Simulating an APPE during a Capstone Course to Prepare Students for Rotations and Facilitate Self-Reflection. Mark A. Della Paolera, Pacific University Oregon, David G. Fuentes, Roosevelt University, Lindsay Christensen, Pacific University Oregon, Jennifer M. Jordan, Pacific University Oregon, Ty Vo, Pacific University Oregon. Objectives: To provide students with a simulated APPE experience to practice various clinical skill sets, facilitate students’ self-assessment, identify their strengths and weaknesses; familiarize them with APPE grading rubrics; and, provide formative and summative feedback. Method: A Capstone Course was developed and 93 students were assigned to teams and a faculty member, assuming the role of “faculty preceptor.” Students performed activities in drug information, hospital rounds, and medication therapy management. Skills were assessed surrounding patient interviews, presentations, and written documentation. Results: Ninety-two percent (n = 86) successfully completed the course without remediation. Most students reported this course improved their self-confidence, allowed them to practice various skill sets, and helped them identify strengths and weaknesses. Implications: Students starting their Advanced Pharmacy Practice Experiences (APPEs) may benefit from receiving individualized feedback from faculty mentors in the didactic setting to prime them for the challenges and expectations of their clinical training during the third year. A similar Capstone Course may be implemented in other schools and colleges of pharmacy as an APPE preparatory activity.

Smile for the Camera: Video Review in Self-Assessment of Communication Skills. Lucio Volino, Rutgers, The State University of New Jersey, Rolee Pathak, Rutgers, The State University of New Jersey. Objectives: Evaluate the impact from student self-assessments of video recorded prescription counseling sessions on perceptions of specific non-verbal and verbal communication skills. Method: Counseling sessions for Pharmacy Communications I students (third professional year) were digitally recorded prior to being evaluated by a faculty member. Students were asked to review their video-taped counseling session and then answer an anonymous, five question survey evaluating whether they perceived their performance as better, worse or the same, compared to before watching their session. Questions addressed various aspects of communication, such as eye contact, facial expressions, body position, and quality of speech. Instructor feedback was withheld until after the counseling self-assessment surveys were completed. Results: All students, (198/198), completed the survey. Of those, 92% agreed or strongly agreed that the self-assessment process was valuable in the development of their communication skills. The greatest difference in assessment post-video review (49.5%) was noted regarding the use of eye contact, for which 35.1% of students underestimated and 14.4% overestimated this ability. Approximately 40% of students noted changes in perceptions for appropriate: rate of speech (42.1%); voice volume (39.8%); and facial expressions (37.2%). The least changes in perception (approximately 33%) were noted in appropriate body positioning/gestures and voice pitch. Implications: Self-assessment of video recorded counseling sessions affected student perceptions on verbal and non-verbal communication
Student Pharmacist Perspectives on Professional Legislative Advocacy and Policy Development. Andrew S. Bzowyckyj, University of Minnesota, Charles J. Peterson, University of Minnesota, Kristin K. Janke, University of Minnesota. Objectives: To determine student pharmacists’ perceptions on both professional legislative advocacy (PLA) and policy development (PD), including importance, interest and preparedness. Method: Second, third and fourth year student pharmacists were randomly selected to participate. Definitions were developed for PLA and PD. A survey to assess students’ perceptions of the importance, interest and preparation for both PLA and PD was developed. Options available for developing PLA and PD competencies were also explored, along with opinions on methods for further competency development. Results: The survey was completed in its entirety by 88 of 164 (54%) randomly selected students. Eighty-seven percent (87%) of respondents agreed that PLA was important for the profession. In addition, 90% agreed that PD was important to the profession. However, only 30% agreed that they had an interest in PLA and only 29% agreed that they had an interest in PD. While 69% of respondents agreed that the college supports students in participating in legislative advocacy, only 18% of respondents agreed that they felt prepared to advocate for the profession on a legislative level. Seventy-three percent (73%) of respondents agreed that student pharmacists can make a difference in PLA. However, only 12% of respondents agreed that there were enough students participating in PLA. Only 24% of students agreed that all students should participate in PLA prior to graduation. Implications: Colleges and schools may need to foster student interest in professional legislative advocacy and policy development, as well as carefully consider methods for preparing students for these roles.

Student Pharmacists’ Perceptions of and Attitudes Towards Peer-Assessment Within a Drug Literature Evaluation Course. Kimberly Wu, Purdue University, Lindsay Davison, Purdue University, Amy H. Sheehan, Purdue University. Objectives: Peer assessment is a valuable tool used throughout the profession of pharmacy. However, little information is available about the use of this process within Doctor of Pharmacy degree programs. This study describes student pharmacists’ perceptions and attitudes towards the use of peer assessment within a drug literature evaluation course. Method: Second professional year student pharmacists completed a written drug monograph group assignment for a required drug literature evaluation course. At the conclusion of the assignment, students completed a peer-assessment form for each group member. A 10-item voluntary and anonymous electronic questionnaire collected information regarding student perceptions of the peer assessment activity, student confidence in their peer- assessment ability, and factors that may affect student attitudes toward providing and/or receiving peer feedback. The peer assessment instrument and questionnaire were nationally reviewed by drug information academics. Results: One-hundred fifty-two students participated, providing a response rate of 96.2%. Results showed 95% (144/152) of students strongly agreed or agreed they had the necessary skills to assess their peers and 91.9% of students (140/152) strongly agreed or agreed their peers did as well. More students strongly agreed or agreed that they were comfortable receiving feedback (95.6% [145/152]) from peers than providing feedback (80% [122/152]) to peers. Implications: Students were more comfortable receiving feedback from peers than providing peer assessment. This skill is used by pharmacists throughout their career; therefore, students need to become more familiar and comfortable with the process in schools. A follow-up study evaluating the impact of this peer assessment on the same students is planned.

Student Perceptions of the Role of Portfolios in Evaluating Expected Outcomes of their Education. John E. Murphy, The University of Arizona, Andrea Bisso, The University of Arizona College of Medicine, Tatum Airey, The University of Arizona, Marion K. Slack, The University of Arizona. Objectives: ACPE recommends incorporation of student portfolios as part of the pharmacy curriculum to allow students to reflect on what they have learned and to evaluate expected curricular outcomes. A study was conducted to determine the perceived value of the portfolio process to students at the University of Arizona and to seek suggestions for improvements. Method: A questionnaire was developed and voluntarily answered by 248 P1 to P3 students. Statistical analyses were performed to determine factors that enhanced the perception of value of the portfolios. Results: Students thought that participating in the portfolio process contributed most to improving their CV/Resume, though their perception of benefit was generally rated as moderate or less for all items. There was a significant correlation between perceived benefit and advisor support and feedback. The most frequent comments for improvement related to the need for more interaction with advisors and to having advisors more engaged in the process. P1s wanted more information and direction on completing their portfolios. Implications: This study shows that the role of an advisor is important to perceived benefit with the portfolio process. It is therefore important that the advisor spend time discussing how to complete the portfolio, what is expected, and to provide feedback on improvements. When portfolios are used correctly they can be beneficial. Improving advisor involvement through education on the importance of their role may increase the perceived value of portfolios to students.

Student-Lead Review Session Program. Michael G. Kendrach, Samford University, Terri M. Wensel, Samford University, Bruce Waldrop, Samford University, Mary R. Monk-Tutor, Samford University. Objectives: Describe a student-lead didactic-course review session (i.e., tutoring) program and present assessment results of this student service. Method: Two students from each year of the didactic curriculum were selected based on communication skills and academic record to lead the course material review sessions. The sessions began in 2010 spring, and continue to be scheduled so participants are able to attend during normal school hours. Leaders review classroom lecture content from the semester and answer questions from student attendees. Student leaders also provide individual tutoring. The Associate Dean for Academic Affairs serves as program coordinator. Results: A total of 164 (43%) of the P1-P3 student body completed an on-line questionnaire of this program in December 2010. Most of the respondents (n = 92) attended at least one session per semester, and the results are based upon those attending. Most attendees rated the program as either excellent (43%) or above average (30%). Almost 50% felt their grades improved while 3% said these sessions prevented them from failing a course; only 3% said the sessions did not help improve their grades. Students indicated that the primary reasons they attended these sessions were to hear course materials presented again (64%) and better understand the content by hearing course materials explained by a student (52%). The main reason students did not attend these sessions was they prefer to study alone. Implications: The student-lead review sessions helped many students and our school will continue to offer the program to support student academic success.
Survey of Student Pharmacist Leaders During a Leadership Retreat. Lauren S. Bloodworth, The University of Mississippi, Laurie Warrington, The University of Mississippi, Kristopher Harrell, The University of Mississippi, Jessica G. Bennett, VAMC - Memphis, Tennessee. Objectives: The Phi Lambda Sigma chapter of the University of Mississippi School of Pharmacy organized a Leadership Retreat for organizational and class officers in July 2010. The purpose of this survey is to evaluate how the retreat enhanced the principles of leadership and advocacy in participants. Method: Organizational and class officers were invited to participate in a two-day leadership retreat. The program included a variety of team-building exercises and interactive programs focusing on leadership and advocacy. Following completion of the program, a voluntary survey was administered to each student. Results: Of the 21 students who participated, 100% responded (1 PY1, 8 PY2, 5 PY3, and 7 PY4). The majority of respondents perceived that he/she improved in terms of self-confidence (95%), leadership abilities (90%), teamwork abilities (95%), time management abilities (76%), and stress management (66%) after attending. The majority of respondents perceived that the retreat had some influence on their motivation to be involved in professional organizations in the future (state level 90%; national level 86%) and to run for office or serve on committees in the future (state level 76%; national level 57%). Around 66% of respondents would strongly recommend the retreat to other student leaders and around 66% would recommend the retreat to be mandatory for all student leaders. Implications: These results suggest that participation in the Leadership Retreat was seen as valuable. It also offers opportunities for student leaders to focus on applying leadership principles to improve his/her ability to effectively lead student organizations.

Team Based Learning to Assess Practical Pharmacy Competencies. Jeanne E. Frenzel, North Dakota State University, Elizabeth Skoy, North Dakota State University, Heidi Eukel, North Dakota State University. Objectives: Evaluate the impact of team based learning (TBL) on first year pharmacy students’ learning of practical pharmacy competencies in a lecture associated with a pharmaceutical care laboratory. Method: All TBL activities consisted of an individual assessment and 2 team assessments. Each student was administered 3 content TBL assessments and 3 cumulative TBL assessments. Students were given an anonymous, voluntary survey assessing their perceived knowledge of practical pharmacy competencies. Survey results were analyzed using chi-square tests. Results: Seventy-seven students completed the survey. Following a semester of team based learning assessments, the sample reported a significant change in their understanding of course concepts, improved individual learning, and preparation for their laboratory course (P<0.001). The sample group also showed an increase in perceived knowledge of nonsterile compounding, sterile compounding, and patient consultation. Implications: Team based learning created an environment of self-directed learning which led to an increase in perceived knowledge of practical pharmacy competencies and preparation for other pharmacy courses.

Team Performance in a Team Based Learning Course. Andrea R. Franks, The University of Tennessee, Michelle M. Zingone, The University of Tennessee, Alexander B. Guirguis, The University of Tennessee, Robert E. Heidel, The University of Tennessee Graduate School of Medicine. Objectives: To evaluate differences in team performance at the beginning, midpoint, and end of a course taught using team based learning (TBL) and to determine if effective team functioning improves student performance. Method: The Team Performance Scale (TPS) is a reliable and validated instrument to measure the quality of team interactions. It includes 18 items scored from 0 to 6 (maximum possible score 108) with higher scores indicating high performing teams. We administered the TPS to students enrolled in an Ambulatory Care Elective at three time points (first, midpoint, and final class sessions). Repeated-measures ANOVA was used to compare team and class TPS scores at 3 time points. Pearson correlation was used to assess the association between TPS score and student performance (final exam and course grade). Results: Twenty-eight students completed the course, and participated in data collection. There was no change between mean TPS score at the three time points (baseline 96.58, midpoint 99.79, final 98.18). Only one team had a statistically significant change in TPS score from baseline to final (p = 0.045). Three of 18 items had significant improvements in mean scores across the semester. TPS scores did not appear to correlate with individual student final exam scores (r = -0.091, p = 0.646). Implications: Team performance as measured by the TPS did not appear to correlate with individual student performance. High initial scores may have been skewed due to social desirability. Future research should include a larger sample size and measures to minimize social desirability bias.

Team-Based Learning (TBL) in a Required Renal Pharmacotherapeutics (PT) Course. Edward F. Foote, Wilkes University. Objectives: To determine the benefit of conversion to a TBL format in a required PT course in renal pharmacotherapeutics. Method: Renal PT is a 2 credit module in fall P3 year. Content includes fluid/electrolyte, acid base, and nephrology. In 2010 the fluid/electrolyte and acid base sections of the course were transformed into a TBL format. Students were given readings (primarily from a PT textbook) and a handout but lectures were not delivered. Individual and team readiness assessment tests (iRAT and tRAT), cases and debriefing were used. An online anonymous student survey was used to assess student opinion on TBL. Exam performance was reviewed. This project was approved by our IRB. Results: As compared to traditional lectures, students agreed or strongly agreed to the following statements: TBL motivated me to prepare for class more (89%), TBL was more interesting (56%), required more effort (86%), was a positive learning experience (79%), enabled a better understanding of the material (52%) and should be used more widely in the pharmacy curriculum (67%). 79% of students felt a sense of “team” during TBL and 64% thought TBL should continue for this course. There was no difference in exam performance between 2009 and 2010. Implications: In general, students appreciated the TBL format although a sizable portion of students clearly prefer a lecture-based format. Subjectively, the instructor felt students appeared to be more engaged and prepared overall. Further study is needed to determine if there are other benefits (long term retention) of TBL.

Technology Issues in the Learning Environment: Emerging Solutions. Michael S. Monaghan, Creighton University, Jeff J. Cain, University of Kentucky, Patrick M. Malone, The University of Findlay, Tracy Chapman, Creighton University, Ryan W. Walters, Creighton University, David C. Thompson, University of Colorado. Objectives: Programs are attempting to manage faculty and student use of technologies in the classroom. The purpose of this project was to identify the effect technology was having on the learning environment and identify how programs were administratively responding to evolving issues. Method: A cross-sectional survey design was used to identify student use of technology in the learning environment. In addition, two open-ended questions solicited solutions that program have implemented to address classroom technology issues affecting both students and faculty. One hundred-eighteen surveys were disseminated and responses analyzed. Results: Eighty-nine surveys
Tendencies in Clinical Pharmacy Journal Publications Over the Past Twenty Years. Sandra Benavides, Nova Southeastern University, Joshua Caballero, Nova Southeastern University, William R. Wolowich, Nova Southeastern University. Objectives: Over the past 20 years, numbers of pharmacy faculty have dramatically increased. Additionally, scholarship requirements of pharmacy faculty have increased. It is unknown, however, to what degree research articles have increased. The goal of the study is to evaluate pharmacy specific journals to determine publishing rates between original research, case reports, and review articles over the previous twenty years. Method: Pharmacy journals in print for at least 20 years, indexed in Medline, and authored primarily by pharmacists were evaluated for article content. All publications were categorized either as research, case reports, reviews, letters/editorials, or other based on the publication types classification system used by PubMed. Descriptive statistics were described. Additionally, data were analyzed for statistical significance utilizing ANOVA with significance at p<0.05. Results: Three journals meeting inclusion criteria were the American Journal of Health-Systems Pharmacy (AJHP), Annals of Pharmacotherapy, and Pharmacotherapy. The total publication rate from 1988-1989 to 2008-2009 increased from 1201 to 2096 (74%) (p<0.05). The rate of original research articles increased from 15% to 19% (NS). The rate of case reports decreased from 13% to 11% (NS). The rate of review articles increased from 12% to 18% (NS). However, individually AJHP and Pharmacotherapy decreased in terms of research publications while Annals of Pharmacotherapy increased. Annals of Pharmacotherapy also decreased the total number of review articles published whereas AJHP and Pharmacotherapy increased. Implications: Despite significant increase in publications in pharmacy specific journals, there appears to be minimal increases in original research, case reports, and review articles published.

The Chronicles of Louisiana: Development and Implementation of Laboratory Sequences into an Integrated Modular Curriculum. Candace T. Chelette, The University of Louisiana at Monroe, Roxie L. Stewart, The University of Louisiana at Monroe, Anthony L. Walker, The University of Louisiana at Monroe. Objectives: To design and implement six one-hour credit laboratory sequences for application of knowledge and reinforcement of key concepts in a newly developed integrated modular curriculum. (P1 to P3 year) Method: Course content incorporated the college’s core competencies and educational outcomes and was developed based on didactic course work during the current semester as well as integration from previous semesters. During the first year, courses focused on basic pharmaceutical science (pathophysiology, medicinal chemistry, pharmacaceutics), top 200 drugs, medical terminology, pharmacy law and ethics, immunology/serology and toxicology. The courses continue to expand on basic sciences while integrating clinical pharmacy practice into the second and third year sequences. Activities are developed and implemented by the lead instructor of record and his/her laboratory liaison (one of three lab faculty) by utilizing the Lesson Plan template. Students are graded based on their hands-on lab assignments, weekly drug quizzes, and service learning project. Individual labs are assessed by the instructor(s) and liaisons by completing a Continuous Quality Improvement (CQI) tool. Students provide feedback on Course Evaluations and through discussions with lab liaisons. Results: Annual Assessment data are used to enhance the lab for the following year. Minor changes have been implemented by the instructors, whereas curricular changes have been referred to curriculum committee for recommendations. Implications: The integrated lab sequence is successful in incorporating all disciplines (pharmaceutical science, clinical pharmacy, immunology/serology, and toxicology) within pharmacy practice and providing practical experience to enhance student learning which could serve as a model for schools implementing an integrated modular curriculum.

The Use of Student Self-Reflection in a Presentation Skills Elective. Morgan R. Comee, Massachusetts College of Pharmacy and Health Sciences-Worcester, Karyn M. Sullivan, Massachusetts College of Pharmacy and Health Sciences-Worcester, Valerie Azzopardi, Massachusetts College of Pharmacy and Health Sciences-Worcester. Objectives: Self-reflection is an important tool used to enhance personal competence and confidence. The purpose of this project was to incorporate student self-reflection into a presentation skills elective and to assess the students’ perceptions of the value of self-reflection. Method: A 2-part self-reflection assignment was incorporated into a presentation skills elective course for first professional year students in an accelerated curriculum. Students’ first presentation was videotaped. Part 1 of the assignment required the student to reflect on presentation delivery and submit, within 48 hours, a written narrative about what they liked best, least, and what was most surprising to them. Part 2 required students to view their presentation video, reflect again on presentation delivery, and submit a written narrative describing 3 strengths, 3 areas for improvement, and 5 goals for the next presentation. A survey was administered at the end of the semester to assess students’ perception of the value of self-reflection. Results: Of the 12 students who completed the survey, 11 (92%) agreed that both parts of the self-reflection assignment were valuable. Six students (50%) ranked 1 of the 2 parts of the assignment as the most valuable course activity. Most students (92%) agreed that they achieved the goals they set for their 2nd presentation. Several students (42%) reported being most surprised by distracting mannerisms while viewing their own videos. Implications: Students perceived self-reflection as a valuable tool when practicing presentation skills in an elective course.

Twitter and Google Voice to Simulate a Resident’s Day On-Call. Gary D. Theilman, The University of Mississippi, Daniel M. Riche, The University of Mississippi, James J. Pitcock, The University of Mississippi. Objectives: We developed and implemented a low-cost technique to simulate a pharmacy resident’s day “on-call” for a class of over 100 students. Method: Students in the third professional year were instructed to “follow” a Twitter account (“@PY3Class”) using cell phones or other devices of their choosing. The students were told that during an 8 hour period they would be “on-call” and would receive pages (“tweets”) referring them to clinical questions similar
to that which a resident might receive. The students had a limited time to develop and call in an answer to a free Google Voice phone number that automatically rolled over to voicemail. Google Voice identified the student who called and time-stamped their answer. A faculty member graded the responses by listening to the recorded voicemail messages at their computer. Results: We have had 3 “on-call” days during which 6 questions were tweeted to the class, providing 633 opportunities for students to respond. Only twice did a student miss responding to a question (99.7% success rate). The first effort was a clinical question that fit in Twitter’s 140 character limit, but subsequent tweets contained URL links to longer consultations on web pages. While the automatic voice-to-text transcription provided by Google Voice proved inadequate, grading was accomplished by listening to the recorded responses. Some students did demonstrate difficulty when verbally organizing answers over the phone, which is a potential area of focus in developing communications skills. Implications: This is a low-cost clinical simulation technique that is easily scaled to any size class.

**Use of Web-Based Videos to Teach Mental Health Topics.** Natalia A. Braden-Suchy, Oregon State University, Ann Zweber, Oregon State University. Objectives: The primary purpose is to evaluate the effectiveness of videos to teach students mental health topics by analyzing their perceptions in terms of their confidence in relating to those who have a mental health problem as well as their interest in learning more about mental health issues. Method: The P2 pharmacy practice course includes didactic instruction on various mental health topics. In lab YouTube videos were used to stimulate discussion of topics including the terminology, social stigma, effect on the patient and their family as well as the effect on other aspects of the patients’ health. A longer video provided the basis for clinical note writing. Eighty-one students completed a survey of seven Likert scale questions, and one question was open ended for students to give feedback. Results: The majority of students agreed that the videos were useful tools. A large proportion of students felt more comfortable interacting with people with psychiatric disorders after the videos. Six students disagreed with a statement that the lab made them feel more comfortable speaking to people with psychiatric disorders. Implications: Use of videos to recognize, identify and discuss mental health issues have become a regular part of the course. Additional methods of instruction and exposure throughout the curriculum are needed to increase comfort levels. There will be an increase in the number of videos and the number of disease states that are reviewed. Supplemental reading will also be provided for interested students.

**Use of a Mock Trial for Pharmacy Honor Council Training.** Renee M. DeHart, University of Arkansas for Medical Sciences, Schwanda K. Flowers, University of Arkansas for Medical Sciences, Paul O. Gubbins, University of Arkansas for Medical Sciences. Objectives: The purpose of student honor councils is to investigate honor code violations. Our College of Pharmacy Honor Council (COPHC) was recently implemented. As a training innovation, members participated in a mock honor council trial. This gave members opportunity to hear and apply recommended penalties to a mock academic dishonesty case. A literature search found little concerning the use of honor councils in higher education and no studies describing use of this training method in pharmacy education. This study assesses the COPHC members’ opinions of a mock trial as a training mechanism. Method: All student COPHC members were invited to complete an anonymous pre and post-training survey. All respondents were included in this analysis. Data were analyzed via descriptive statistics. Results: All members attending the trial completed the survey. The exercise improved respondents’ understanding of the honor code and their role on the council (mean scores improved from 3.125 to 5.0 and 2.75 to 5.0, respectively, on a 5 point scale). The exercise maintained or improved self-reported ability to hear a case (mean of 3.6 and 4.9 pre and post-hearing, respectively). In addition, their confidence in the council’s ability to maintain anonymity remained high. In 50% of respondents, the exercise improved self-reported confidence in ability to report an honor code violation relative to their perception of their classmates’ reporting ability. The exercise also helped identify clarifications needed to the Honor Code document. Implications: A mock trial is an effective way to train honor council members and may identify additional improvement opportunities.

**Using Facebook to Connect Students and Faculty Outside of Class: Student Perceptions and Utilization Data.** Margarita V. DiVall, Northeastern University, Jennifer Kirwin, Northeastern University. Objectives: To use Facebook (FB) to facilitate discussion related to course content and study strategies and evaluate use and perceptions. Method: A group FB page was created and students were invited (not required) to “like” the page to enable them to see posts. Course coordinators encouraged FB participants to post study tips, links to media, or clarifications of concepts. At the end of the course, students were asked to participate in an anonymous survey. Results: During week 1, there were 81 followers, 13 wall posts, and 416 visits. At peak utilization the page had 118 followers, 52 wall posts and 888 visits in 1 week. Exam weeks were associated with higher utilization. 119 students (97%) participated in the survey. 97% of respondents already had a FB account and 71% reported daily use for social networking. 26% of students contributed posts to the page compared to 6% who reported posting on course Blackboard discussion board (BDB), the rest were observers only. 60% reported that they were more likely to post questions on FB than the BDB. 76% felt more likely to be exposed to posts on FB than BDB. Study tips were rated the most useful FB posts (66%). 86% of students found FB utilization overall beneficial and helpful in their learning, and 57% said they will miss FB if not used in future courses. Implications: In our course students exhibited preferences for using FB rather than BDB and most found posts beneficial to learning.

**Using Warning Labels to Promote First-Year Pharmacy Students’ Recognition of their Role as Public Educators.** David G. Fuentes, Roosevelt University. Objectives: To identify students’ early knowledge of the clinical use, purpose and value of auxiliary labels (warning labels), and explore if students’ knowledge and perceptions of these changed after a 1-hour lecture featuring case vignettes in substance abuse and addiction. Method: First-year pharmacy students received a substance abuse and addiction lecture featuring content including commonly used warning labels and patient-specific vignettes focusing on patient safety. Students took a pre-lecture survey asking them: Have you encountered or used warning-labels in your pharmacy practice experience? If so, please describe your ideas regarding their clinical relevance. A post-lecture survey then asked them to identify the most important concept learned pertaining to warning-labels. Students were also asked if their opinions regarding the clinical relevance of warning labels had changed because of the lecture. Results: Ninety-one students completed the pre-lecture survey. Sixty-two percent (n = 56) reported possessing prior knowledge, providing a definition of auxiliary labels with specific reference to warnings, administration, use and storage, and patient safety issues related to counseling and health literacy. Only 88 students completed the post-lecture survey. Of those, 67% reported
having altered their views on the importance of the warning labels, citing even greater recognition of their role in educating patients. Thirty-two percent reported no change in their perceived value of these labels, stating they had used these principles in prior work experiences and/or at IPPE practice sites. Implications: Linking the practical aspects of pharmacy can help students see their clinical value and recognize their own professional role in educating the public.

Using a Video Diary to Document Student Pharmacist Political Advocacy Activities. Anne C. Pace, University of Arkansas for Medical Sciences, Schwanda K. Flowers, University of Arkansas for Medical Sciences. Objectives: Political advocacy skills development is important for student pharmacists, but it is often lacking in the professional curriculum. To address the gap at our institution we created an elective course offering to expose students to advocacy, the legislative process and the role of different professional organizations. Based on results of evaluations from the first two years and a survey of the student body, the capstone project was changed to facilitate student involvement in local advocacy activities. Method: Students volunteered for a political campaign and documented the experience through a video diary. The necessary video equipment was available through the course coordinator. Video diaries were assessed using a rubric including discussing health care issues with their candidate, an overview of the experience and video presentation. Student evaluations of the course were compared between the years prior to the video diary and video diary year. Results: Evaluations from 2008-2010 remained consistent ranging from 4.50 to 4.95 (1 being strongly disagree and 5 being strongly agree). Comments regarding the capstone experience improved in 2010 and included that students enjoyed the political campaign experience and they gained a new perspective regarding political campaigns. Implications: Having students document advocacy activities through a video diary is a creative way for students to apply information taught in the classroom and encourage participation in advocacy efforts as students and pharmacists.

Using an Analysis Requirement for Assigning Compounded Product Grades: Required or Optional Re-Makes? Robert P. Shrewsbury, University of North Carolina at Chapel Hill. Objectives: Twenty five compounded products are formulated each academic year by approximately five hundred students in the Pharmaceutical Care Laboratory five semester sequence. These activities generate about 4,000 products that are available for active drug analysis. For several years, the product analysis results were used as a basis for assigning grades. The grading scheme assigned full marks if the product was within an acceptable standard range. If the formulation was outside the range, zero marks were given and the student was required to re-make their product for full marks. This grading scheme was subsequently changed so that the student had the option to re-make their product for full marks. The possibility that student effort might decrease in light of the less stringent grading requirement was a concern. Method: The study compared six compounded products analyzed before and after the optional re-make provision was instituted. Data from the two periods was compared for 1) number of students who compounded the product correctly the first time, and 2) variation in the active drug strength (z-test). Results: The number of students who compounded the product correctly the first time was not statistically different after the optional re-make provision was implemented. However, significant variability in the active drug strength was found in some products. Implications: It has previously been shown that implementing an analysis requirement improved student performance when compounding products. These current results suggest that the type of re-make provision in the analysis requirement had minimal impact on overall student effort.

Utilization of Drug Information Resources by Community Pharmacies in Mid-Missouri. Eve C. Elias, University of Missouri-Kansas City, Natalie Freibberger, University of Missouri-Kansas City. Objectives: To measure mid-Missouri pharmacists’ awareness and use of various drug information resources including the use of the services of university based drug information centers staffed by APPE pharmacy students. Method: Interviewers asked to speak to a pharmacist at each of 68 locations, and inquired if they have time to complete a short survey concerning drug information resources. A multiple choice survey was used to collect the data, along with an opportunity for the study subject to provide feedback if desired. Results: Fifty-one community pharmacies completed the survey (75%). Most community pharmacies (74%) have some combination of print and database resources available. Sixty-three percent of community pharmacies have never used the services of a drug information center and only (53%) had the contact information for the nearest drug information center. Implications: This research shows that drug information centers may be underutilized by community pharmacists. Respondents who had used the services were either satisfied or very satisfied with the reply. Services provided by drug information centers can benefit community pharmacists and the patients they serve. Utilizing these services can not only strengthen the bonds between the community pharmacists and their patients but also with the school of pharmacy and their students.

Utilization of a WIKI to Enhance Student Learning within an Elective Pediatric Course. Pamela H. Koerner, Duquesne University, Jennifer P. Elliott, Duquesne University, Jennifer Heasley, Duquesne University. Objectives: The objective of this innovation was to use technology to create resources for longitudinal utilization of educational materials. Method: Two three-credit pediatric electives were developed utilizing a self-directed learning model and organized through a WIKI. Students completed 12 patient case presentations by the end of the semester and posted their slide sets to the WIKI weekly. The WIKI was then accessed in the didactic part of the class and the slides presented. In addition, the wiki was a mechanism to create an on-line resource database for the students throughout the semester. A total of 180 resources were posted by semester end. Results: The WIKI enabled students to have access to a central repository of information throughout the semester and during experiential rotations the following academic year. Over 300 files were uploaded throughout the semester. A pre/post satisfaction survey was administered to assess perceptions of the WIKI and its ability to enhance learning. An 11.43% increase from baseline showed that most students regarded the incorporation of a WIKI as a useful learning tool. Over 75% of students continued to utilize the WIKI after the conclusion of the course, with 40% continuing to access it 6 months after course cessation. Finally, the WIKI allowed files to be readily retrievable and was a convenient and efficient way to facilitate student presentations in a classroom setting. Implications: The use of a WIKI was a valuable recourse to organize class material, enhance student learning, allow for longitudinal access of material, and assist with efficient use of classroom time.

Video-Based High-Fidelity Simulation Improves Critical Care Knowledge Gain. Julia Reffert, University of Nebraska Medical Center, Paul P. Dobesh, University of Nebraska Medical Center, Donald G. Klepser, University of Nebraska Medical Center, Dean S. Collier, University of Nebraska Medical Center, Keith M. Olsen, University of Nebraska Medical Center, Patricia K. Carstens, University of Nebraska Medical Center. Objectives: Recent studies have demonstrated that high-fidelity human patient simulation (HPS) can

Interviewing (MI) is increasingly viewed as a relevant and effective tool that pharmacists can use to collaboratively improve patient health behaviors. Most models for disseminating motivational interviewing training have involved face-to-face training or webinars, which have limited scale and effectiveness. This study involved the development of an on-line self directed training module that was also combined with an artificial intelligence (AI) application for the purpose of providing effective MI training to a large number of pharmacists. Method: A national panel of academic and practicing community pharmacists worked for two years to develop a self-directed on-line curriculum on MI for application within the DMEducate™ program. An on line application involving natural language recognition, patient simulation, guided learning and gaming methods is also being developed to compliment the on-line curriculum. Results: The on-line curriculum has been successfully used by various Pharmacy Schools with their students and residents. Practicing pharmacists have also used the curriculum to learn how to apply MI in community pharmacy settings. The AI application is being developed using the input of the panel and practicing pharmacists, and preliminary results indicate that it is engaging and changes user knowledge and skills. Implications: The combination of an on-line curriculum and AI application appears to provide effective training and enhance the spread of effective MI training.

A Novel Approach to Improving Pharmacists’ Cultural Competency: Explaining Medication Use to Immigrants and Refugees. Leslie A. Vitin, Northeastern University, Kathy Bu Massaro, Northeastern University. Objectives: To test a method of educating immigrants and refugees on appropriate medication use. Immigrants integrating to the U.S bring their culture and prior experiences when it comes to their health. As pharmacists, we need to learn how to respect cultural beliefs while ensuring safe and effective use of prescribed medications. Method: A descriptive study on the development and presentation of an educational session on medication use to an audience (n = 80) including Nepali, Burmese, Iraqi, Somali, Sudanese, Russian, and Cuban refugees and respective interpreters. To expose APPE students to the multitude of medication beliefs, students from Northeastern University School of Pharmacy presented at the New Americans Center (NAC) in Lynn, MA (Nov-2010). NAC is a federally funded non-profit adult education and resource center for refugees. Each group’s interpreter completed a form about what they had learned from the presentation. Due to literacy concerns, verbal feedback was also obtained from the interpreters. Results: We will post the presentation including all pictures and accompanying script. Audience comments were collated by ethnic background. In general, participants reported learning not to be fearful of telling providers if they had missed medications or using home remedies, not sharing medications with others and not waiting to seek medical care for ‘acute’ conditions. Overall, the audience reported having learned ways to improve their health and the health of their families. Implications: Using culturally sensitive techniques to educate patients on medication use, pharmacists can have a large impact on achieving health outcomes and diminishing ethnic health disparities in communities.

Advancing Interprofessional Education: A Strategic Approach. Veronica S. Young, The University of Texas at Austin, Jan E. Patterson, The University of Texas Health Science Center San Antonio, Raymond A. Howard, The University of Texas Health Science Center San Antonio, M. Aggie Manwell-Jackson, The University of Texas Health Science Center San Antonio, Maureen Rubin, The University of Texas at San Antonio, Frank I. Moore, The University of Texas Health Science Center at Houston, Amruta Parekh, The University of...
Texas Health Science Center San Antonio. Objectives: In the summer of 2009, the president of the University of Texas Health Science Center San Antonio (HSC) chartered an interprofessional education (IPE) taskforce to identify the current status of IPE at the HSC. The objectives of the taskforce were: 1. identify the current status of IPE on campus including gaps in research and current IPE activities; 2. discuss the role of IPE with the HSC infrastructure; 3. develop a campus-wide conference on IPE; 4. recommend a long-term strategy to expand IPE. Method: The Task Force was co-chaired by the Associate Dean for Quality and Lifelong Learning, School of Medicine, and the Dean of the School of Health Professions. The Task Force consisted of 23 members representing the five academic health schools at the HSC, Office of Student Services, Center for Medical Humanities and Ethics, the Academic Center for Excellence in Teaching, Academic Technology Services, Office of the President, UT Austin College of Pharmacy, UTSA College of Public Policy, and UTHSC Houston School of Public Health. Results: The IPE Task Force defined interprofessional education, identified barriers and obstacles to IPE implementation, and made recommendations to enable expansion and sustainability of IPE course offerings. The report was submitted to the Office of the President which approved actions to initiate changes. Implications: Successful implementation of IPE requires support and commitment from the president’s office, administration, faculty, staff and academic support services. To advance IPE across professions, significant barriers identified must first be addressed.

Business Practices for Pharmacy Students-A Primer for Future Success. Erik J. Nelson, Washington State University, Jennifer D. Robinson, Washington State University, Kurt Bowen, Washington State University, Linda G. MacLean, Washington State University. Objectives: To create a business management and leadership elective developed by two second year student pharmacists. Method: An advanced business management and leadership elective was developed by two second year student pharmacists to cover topics that included: finance, marketing, advanced management, taxation, human resources, risk management and pharmacy wholesale suppliers. The class was a seminar series which featured presentations by pharmacy professors, business professors, and outside business professionals with varying expertise. Participating instructors were asked to lead an informal discussion focused on a topic agreed upon by student developers. Enrolled students were required to submit relevant questions for the speaker to address during the discussion and submit weekly reflection papers outlining lessons learned and a brief synopsis of the material presented. Results: Thirty students showed interest in the class but due to space constraints only 14 were enrolled. Thus far the course has been well received by students and participating instructors. Upon completion of this course students will complete detailed course evaluations; the results of which will be analyzed and included in the project analysis. Implications: Allowing student pharmacists to develop and administer an elective course can result in a successful learning experience and aid Doctor of Pharmacy programs in achieving educational excellence. This student driven course re-enthused the value of leadership and business innovation. It may serve as a model for future student directed elective course work.

Connecting the Dots-Infectious Diseases Bench Research to Disease State Management. Celia P. MacDonnell, The University of Rhode Island, Clyde Belgrave, VMAC, Kerry LaPlante, The University of Rhode Island. Objectives: To introduce students to research done in a clinical microbiology laboratory and encourage them to map the process from morphology to practice guidelines to patient centered care. Method: Infectious disease research faculty teamed with third year Professional Practice Lab faculty to develop a module that allows students to have a greater understanding of laboratory tests leading to direct antimicrobial pharmacotherapy. The students first participate in a short review of bacterial morphology and gram staining with an emphasis on Staphylococcus aureus. Divided into three teams, the students then rotate through three stations: Clinical Micro Lab 101 (led by ID research faculty), The Inpatient Experience (led by lab faculty), and the Outpatient Experience (led by attending physician VAMC Providence RI). Station one includes: E-testing, heteroresistence, micro broth dilution, Kirby-Bauer, and interpretation of antibiograms. Station two includes: evaluating a patient with Community Acquired Pneumonia, application of the Pneumonia Outcomes Research Team (PORT), and aminoglycoside dosing. Station three highlights the CDCs National campaign to decrease the prescribing of antibiotics for viral infections “Snort, Sniffle Sneeze, No Antibiotic Please”.

Developing a Pharmacy Services Model for a Student Run Medical Outreach Clinic for the Homeless. Kristen L. Ochs, Southern Illinois University Edwardsville, Janice R. Frueh, Southern Illinois University Edwardsville. Objectives: To create a clinical service plan to provide pharmacy services for a student run medical outreach clinic for the homeless. Method: A literature search on pertinent research and reports on existing student-run clinics (SRC) in the United States, the role of the SRC in underprivileged patient healthcare, and student pharmacist involvement in these clinics was performed. A student pharmacist and faculty mentor from Southern Illinois University Edwardsville School of Pharmacy (SIU-SOP) developed a model for implementing pharmacy services into an SRC that is interested in expanding existing medical services. Results: The incorporation of student pharmacists into the SRC model poses the opportunity for inter-professional teamwork with medical students to provide cost effective, continuous healthcare services to the local homeless patient population served at the Southern Illinois University School of Medicine (SIU-SOM) Student Run Health Clinic for Homeless and Uninsured. Implications: The addition of student pharmacist involvement and the development of a comprehensive pharmacy services model for this SRC will enhance access to quality care and lead to improvements in health outcomes for participating patients.

Development and Incorporation of a Professionalism Assessment into a Doctor of Pharmacy Program. Anne Marie Liles, Auburn University, Kelly Hester, Auburn University, Kristi W. Kelley, Auburn University, Allison Chung, Auburn University, Paul W. Jungnickel, Auburn University. Objectives: To develop a mechanism to evaluate student pharmacists’ professional development across the Doctor of Pharmacy program. Method: Five tenets were identified to define professionalism: responsibility, honesty and integrity, commitment to excellence, respect for others, and professional stewardship. These tenets were then incorporated into a formative assessment tool by which students are assessed for development in each of these areas. Completion of the assessment was integrated into two courses where faculty interact with students in small group settings, one spanning the first three years and one in the third year. Assessments are also spontaneously completed to document both exemplary and problematic professionalism incidents. Assessments can be completed by any faculty members, staff, or by student pharmacists.
through faculty. The assessment considers all aspects of the program including didactic and experiential courses, and professional extramural activities. Policies were developed detailing when, how, and by whom the assessment is completed in addition to consequences for receiving unsatisfactory ratings. Results: The data from the assessment adds a new dimension that allows professionalism to be factored into progression decisions along with traditional academic performance. Implications: This formal assessment process provides a means to relay feedback on both positive and negative professionalism behaviors across student pharmacists’ professional education and fosters a culture of professionalism amongst all staff, faculty, and students, which is consistent with ACPE standards. Coupling academic performance and professional accountability in essence is changing the culture of student pharmacist evaluations.


Objectives: There are several ways to communicate concepts of ethical practice. To gain perspective on practical application of ethical and professional tenets, students must be exposed to situations requiring consideration of how personal actions affect others and society. This process was facilitated in an Ethics and Professionalism pharmacy elective course through the development of a novel structured format that allowed for active student engagement. Method: This format is referred to by the acronym “ETHICS,” which stands for “evaluate, teach, hear, interview, concede, and self-reflect.” This was created to guide students towards making ethically and professionally sound decisions. During class sessions, student groups of 5 were provided with a brief topic discussion. Students were then presented with a case and asked to discuss the case from perspectives of various ethical tenets and case players while utilizing the ETHICS format. Example case content included patient care, pharmacogenomics, industry/research, and vulnerable populations. Each class session concluded with a submission of a standardized written self-reflection of that day’s discussion. Results: The ETHICS format allowed students to actively engage in discussions and apply ethics and professionalism-based concepts in controversial situations. The ETHICS format transformed class sessions into student-centered sessions with active engagement while incorporating a structured plan of self-reflection. Implications: The ETHICS format allowed direct and practical application of concepts to controversial situations. Although the ETHICS format was created for a pharmacy elective, this format can be adapted and employed in any teaching situation to actively engage students in the discussion of controversial ethical issues.

Evaluation of Optimal Liquid Medication Dosing Devices for Pediatric Patients. Jennifer P. Elliott, Duquesne University, Jamie L. McConaha, Duquesne University, Nicole Marcotullio, Duquesne University, Ira Buckner, Duquesne University. Objectives: The US Food and Drug Administration (FDA) released voluntary guidelines in November 2009 to industry groups responsible for the manufacturing, marketing, or distribution of over-the-counter (OTC) liquid medication, particularly those used by children. One recommendation was that measuring devices should be included with all OTC liquid medications; however the guidelines do not recommend one consistent type of measuring device, despite high prevalence of parental dosing errors with certain devices. Therefore, the objective of this study is to determine the most accurate and precise liquid medication dosing device. Method: Three of the most commonly included dosing devices (cup, dropper, and syringe) will be assessed for precision and accuracy of dosing four liquid formulations of acetaminophen (solution, syrup, suspension, and elixir) in both the laboratory and clinical setting. In the laboratory, the precision and accuracy of each dosing device when delivering the various acetaminophen formulations will be assessed. The three liquid formulations, of the four tested, with the highest degree of difference between viscosity will be used in the clinical setting. The ability of caregivers to accurately and precisely administer an indicated volume of each acetaminophen formulation with each measuring devise will be assessed at three community pharmacies locations. Results: Our study will provide the FDA with needed evidence to mandate inclusion of specific measuring devices for each respective medication formulation, ultimately providing consumers with consistency in OTC medication dosing devices. Implications: Future research projects will seek to determine the effects of caregiver health literacy, product labeling, and dosing instrument labeling on dosing accuracy.


Objectives: The prevalence of obesity among individuals aged 12 to 19 years increased from 5.0% to 18.0% over the past three decades. Obese adolescents are at greater risk for cardiovascular disease and social psychological issues. Obesity rates have started to decline for many teenage groups but continue to increase for some ethnic and racial minorities despite nationally instituted initiatives. The organization of Touro College of Pharmacy in Harlem where 72% of the population is African-American and Hispanic reflects a commitment of the institution to provide educational opportunities to both its students and this underserved population. Method: Through the college’s partnership with the Harlem Education Activities Fund, a seven-week interactive seminar was developed to combat this health epidemic. Goals of the program included cultivating high school students on healthy lifestyle behaviors. Results: These weekly two-hour sessions at the college were extremely successful. Twenty two students participated in hands-on educational games and demonstrations including a virtual grocery store tour, a food label reading and interpretation workshop, a nutritional facts jeopardy match and the “diabetic dog” contest. Students were also instructed on defining signs of “metabolic syndrome” and distinguishing commonly used prescription drugs for this underlying disease state. Students created presentations on lessons learned throughout the experience and results of these assessments revealed a heightened consciousness of socioeconomic values. Implications: Partnerships with pharmacists and other community members have lead to increased public health awareness and access expansion.

among previously underserved populations. Utilizing non-traditional settings can serve as a sustainable community health extender model for high-risk populations in disadvantaged urban communities.

**Implementation of a Pharmacy Practice Pathway at the University of Mississippi.** Shirley M. Hogan, The University of Mississippi, Kim G. Adcock, The University of Mississippi, Ashley W. Ellis, The University of Mississippi, Daniel M. Riche, The University of Mississippi, Katie S. McClendon, The University of Mississippi. **Objectives:** To describe a novel project requiring students to complete a longitudinal research project as a component of the pharmacy practice curriculum. The Pathway project is intended to improve interactions between students and faculty. **Method:** Each student is assigned a Pharmacy Practice advisor for their project. The student is responsible for: (1) Generating a project idea, (2) Creating a study design, and (3) Completing a project with the assistance of a Pathway advisor. Students and advisors were given a handbook to define this process. To encourage peer collaboration and communication, Pathway families have been established. Each family consists of 2 or more students from each professional year, headed by a Pathway advisor. Therefore, students have a faculty advisor and a peer group with which to discuss their research topic, problems, and resolution of obstacles. **Results:** Two classes of students have begun the Pathway process. The Class of 2013 is in the process of formulating their idea and focusing their research question. The Class of 2014 has completed a review article requirement and will begin formulating ideas for their projects during 2011. Major obstacles have included communication difficulties between students and advisors, as well as a clear understanding of expectations. **Implications:** The Pharmacy Practice Pathway is in its early stages of development, but students and faculty are adapting to the requirements. Obstacles have been identified and resolved. Students have been able to complete tasks on time and appear to be moving forward with projects that meet course requirements.

**On a QuEST: Development of Mini-Patient Cases to Facilitate Over-the-counter Medication Discussions with APPE Students.** Meghan K. Sullivan, University of Maryland. **Objectives:** In an effort to reinforce patient interview skills, patient-specific treatment and monitoring plans and over-the-counter product selection, mini-patient cases were developed to facilitate weekly self-care and nonprescription medication topic discussions with community APPE students. **Method:** In addition to reviewing literature regarding various self-care topics including but not limited to cough, cold and allergy, pain, gastrointestinal disorders, herbal supplements and ophthalmic care, students are asked to select from a deck of patient cases. Each patient case card includes information regarding the ‘patient’s’ gender, age, current condition and chief complaint, past medical history and brief symptom analysis utilizing the SCHOLAR pneumonic as a guide. Given the information provided on the card, the student is expected to fulfill the QuEST process through the assessment of the patient, evaluation of self-care candidacy and selection of an appropriate nonprescription product. The student’s findings are then presented to the preceptor during the weekly topic discussion where justification for the completion of their quest and patient education is provided. **Results:** Feedback is given to the students utilizing a grading rubric that addresses communication skills, the assessment of patient-specific treatment and monitoring plans and the selection and justification of a nonprescription medication product. Incorporation of this assignment will continue to be seen in this rotation. **Implications:** Based on student pharmacist feedback, additional cases will be developed to enhance the learning experience.

**Rising to the Challenge: Addressing Curricular Needs in Health Literacy and Cultural Competence.** Carla J. See, West Virginia University, Betsy M. Elswick, West Virginia University, Virginia Scott, West Virginia University. **Objectives:** To develop active learning exercises to enhance pharmacy students’ knowledge, skills and attitudes in assisting patients with health literacy barriers. **Method:** A curricular need was identified for expanding the student exposure to health literacy and cultural competence issues. Based on a previous study by Sicat & Hill (AJPE 2005; 69 (4) Article 62), expanded lectures were introduced in a patient health education course and an adaptation of the original researcher’s practical exercises was implemented in a pharmaceutical care lab (PCL) setting. The lecture focused on defining functional health literacy and strategies to assist low-literate health care consumers. The PCL experience included three active learning exercises, adapted from the original research, and led by faculty members, Pharm.D residents and an APPE student. **Results:** Student feedback indicated that the addition of the three active learning exercises was a good complement to the didactic lecture. Of the three exercises, the students preferred the role playing of a patient counseling session. **Implications:** The PCL provides an excellent opportunity for practical learning experiences which support didactic lectures. The course will next be taught in Fall 2011 and authors plan to replicate the original study by surveying the students pre- and post-lecture/PCL to evaluate how their knowledge and attitudes changed. A cultural competency component will be added to the PCL sections to address meeting individual patient needs and overcoming barriers.

**Teaching Pharmacy Students the Principles for Successfully Implementing Pharmacy Care Innovations.** Randall B. Smith, University of Pittsburgh, Janice Pringle, University of Pittsburgh. **Objectives:** The objective of this paper is to present the multi-media curriculum used with pharmacy students in their third professional year to teach the principles for successfully implementing pharmacy care innovations. **Method:** The University of Pittsburgh School of Pharmacy has developed a multi-media course that provides pharmacy students with the principles that guide the successful implementation of pharmacy care innovations. The course provides a didactic component, which covers the prevalent, but ineffective approach that is based in complex adaptive systems theory. Complex adaptive systems are a more accurate model to describe how pharmacy care systems behave and react to change. Students are provided information regarding the importance of a system vision, the five main strategies (called levers) that significantly improve the chances an innovation is successfully implemented within any given pharmacy care system. Students are given the opportunity to apply this knowledge within a specific real pharmacy worksite and derive a detailed strategy to guide the implementation of an innovation of their choosing. **Results:** The course’s pedagogical platform, curriculum resources, pharmacy worksite project guidelines, student performance and feedback from the course are discussed. **Implications:** As our healthcare system undergoes significant change, it will become imperative that the profession of pharmacy learns how to rapidly and effectively integrate specific innovations that improve patient care at ever-reduced costs.

**Work in Progress**

**A Diabetes Self Monitoring Home Project in a 1st Year Student Pharmacy Practice Course.** Nathan A. Painter, University of California, San Diego, Candis M. Morello, University of California, San
A Diabetes Simulation Encounter to Evaluate Satisfaction with Standardized Patients and Assess Clinical Skills of IPPE Students. Erica J. Otis, University of Missouri-Kansas City, Frank Caligiuri, University of Missouri-Kansas City, Deepti Vyas, California Northstate College of Pharmacy. Objectives: With the Accreditation Council of Pharmacy Education allowing simulation to account for 20% of Introductory Pharmacy Practice Experience (IPPE) hours, student perceptions of simulation within IPPE should be explored. The objective of this study was to evaluate student attitudes and satisfaction with a focused diabetes simulation in a clinical IPPE. Method: Students participated in a 30 minute simulated clinic visit at a university simulation center. Prior to the simulation, students were provided with a patient case that included the chief complaint and relevant laboratory data. On simulation day, students were instructed to obtain a medication history, a health history, and perform a targeted physical exam on a standardized patient (SP) relevant to diabetes and hypertension. Students were then asked to write a SOAP note to document the encounter and identify any drug related problems. Faculty observed via real-time video feed and provided summative feedback to each student. Following the simulation, an attitudes survey was administered. This survey addressed items such as the impact of simulation on their physical assessment skills, making therapeutic interventions based on the physical exam and medication history findings, and on providing patient education regarding preventative strategies and disease management. A satisfaction survey was also administered which provided qualitative data for course improvement. Results: 26 students completed the post-simulation surveys. Data are currently being analyzed and will be reported using descriptive statistics. Implications: The data will be used to determine student attitudes regarding simulation and to what degree to incorporate simulation into IPPEs in the future.

A Pilot Academic Pharmacy Mentorship Program. Stephanie L. Ballard, Nova Southeastern University, Jennifer J. Wellborn-Kim, Coral Springs Medical Center, Daniel Vacca, Nova Southeastern University, Jennifer G. Steinberg, Nova Southeastern University. Objectives: Following recommendations to establish opportunities for mentoring as part of a comprehensive 1st Year Diabetes Self-Care Education Program (DSEP), evaluate student confidence and technique in training another person to perform glucose monitoring, and evaluate student confidence in their ability to keep an accurate blood glucose log. Method: A follow up survey, using a 5-point Likert scale, was administered 2 weeks after completion of the SMBG assignment. Questions included demographics, assessment of confidence in glucose monitoring, ability to teach another person how to use a glucose monitor, collect all needed supplies, document results in a SMBG log, and empathy towards patients with diabetes. Results: 51 of 59 students completed the survey. 94% of students stated they strongly agreed or agreed that the SMBG home assignment helped increase empathy for people with diabetes, they felt confident in their ability to operate a glucose monitor, and believed they knew the supplies necessary for home glucose monitor testing. 92% of students stated they strongly agreed or agreed that they believed they had the skills to describe the important criteria to evaluate when selecting a glucose monitor for patient, felt confident they could train another person to perform glucose monitoring, and felt confident in their ability to explain the details needed to maintain a complete glucose log. Implications: A SMBG assignment, as part of a comprehensive first-year DSEP, increases student pharmacists’ confidence in performing glucose monitoring and training another, as well as empathy for diabetes patients.

A Faculty Led Residency Interview Preparation Service. Carrie Koenigsfeld, Drake University, Geoff Wall, Drake University, Andrew R. Miesner, Drake University, Ginelle A. Schmidt, Drake University, Sally Haack, Drake University, Darla K. Eastman, Drake University, Sarah E. Grady, Drake University, Anisa Fornoff, Drake University. Objectives: A faculty led mock interview activity was created to enhance pharmacy student preparation for the residency interview process. Method: Students volunteered for a 40 minute mock interview session with two-person faculty teams. A standard roster of 12 interview questions was derived from the published literature and the faculty members’ experience. The final portion of the session was used for the faculty team to provide feedback on the student’s interview performance and to answer questions. Following the interview, students were given a two part survey instrument. The first part of the survey was administered immediately following the mock interview session. The second part of the survey will be administered after the standard date for residency program results (known as “Match Day”). To assess the potential impact of the interview service, the investigators will compare participants’ match rates to ASHP national and Drake’s residency match rates. Primary outcomes to be assessed include (1) the final percentage of students who participated in the interview service and secured a residency (and those who did not) in comparison to the percentage of students who did not participate in the service who secured a residency (and those who did not), and (2) students’ overall impression of the usefulness and effectiveness of the mock interviews. Results: Results are forthcoming and will be presented at the meeting. Implications: Implications will be discussed following assessment of forthcoming results.
for students to develop personal perspectives on academic pharmacy as a career option, Nova Southeastern University implemented the Academic Pharmacy Mentorship Program (APMP). The APMP is a 6-week formal program that introduces students to academic pharmacy while developing mentoring relationships with faculty. The objective of this mixed-methods study is to assess the impact of the 2-year repeated APMP pilot on student perspectives and interest in academia. **Method:** Mentees participated in focus group interviews at the beginning and end of APMP programming. Interview transcripts were analyzed for themes. Triangulation was performed using pre-test and post-program evaluation survey information. Data was reviewed after the first APMP cohort, resulting in feedback-driven changes to the program. **Results:** During pre-APMP interviews, participants expressed curiosity about academia, with confusion regarding research and minimum education requirements. Most planned to enter hospital pharmacy practice without postgraduate training. Post-APMP, participants expressed positive perceptions of academic pharmacy, which was consistent with program evaluation data. All first-cohort participants considered themselves “more” or “much more” likely to pursue an academic appointment at a school of pharmacy. Major themes of post-APMP interviews included misinformation among students, post-graduate training, and diverse responsibilities of pharmacy practice faculty. Full analysis of the 2-year cohort (N=15) is expected April 2011. **Implications:** Preliminary data suggests this formalized mentorship program is an effective format to increase student interest in academic pharmacy. Of note, 75% of first-cohort mentees applied for residencies. Further considerations regarding program impact will be based on postgraduate education and career choice outcomes of participants.

**A Prospective Evaluation of Group Presentation and Peer Review in a Critical Care Elective Course.** Daniel Malcom, Sullivan University, Jennifer Hibbs, Sullivan University, Kimberly K. Daugherty, Sullivan University. **Objectives:** Pharmacy students in a 3-year accelerated program were required to prepare and deliver group oral presentations and utilize feedback from peer review analysis in an elective critical care course. The objective of this pilot study was to determine if successful knowledge attainment and comprehension of key therapeutic topics in critical care could be accomplished through group presentation and peer review analysis. **Method:** An elective course was implemented using an active learning process of group oral presentations and subsequent peer review analysis covering pre-selected critical care therapeutic topics from the ACCP Pharmacotherapy Tool Kit. At the introduction and upon completion of the course, a non-punitive assessment tool developed by course faculty comprised of multiple-choice questions relating to the therapeutic topics was completed by the students. A faculty-blinded student satisfaction survey was also completed at the conclusion of the course relating to attainment of program and course outcomes and student perception of the course. **Results:** A comprehensive evaluation of student performance will be presented with focus on overall class results and intra-student results. Results from individual pre-course test scores will be compared with post-course scores. Post-course scores will also be compared to actual class grades to determine correlation. Survey results will be evaluated to assess the degree to which student satisfaction and class performance correlate with post-course assessment score. **Implications:** Incorporation of active learning group-driven education may facilitate effective knowledge retention and improve student satisfaction with difficult therapeutic topics in critical care.

**A Faculty-Initiated Mentoring Program for Fourth Year Pharmacy Students Seeking Postgraduate Training.** Amy Pick, Creighton University, Gary N. Elsasser, Creighton University, Pamela Foral, Creighton University. **Objectives:** Postgraduate training programs (residencies/fellowships) are becoming more competitive due to increased demand without an increase in the number of positions available. The purpose of this program is to maximize our students potential for acquiring a residency/fellowship. **Method:** We developed a faculty-initiated mentoring program to assist fourth-year pharmacy students applying to postgraduate programs. An email was sent to all fourth-year students in September asking if they would be interested in having a faculty member assigned to them to help with the application process. Faculty mentors were assigned students based on similar interests or professional goals. Faculty mentors assisted students with program selection, CV review, interviewing tips and answering questions. Mentors also assisted the student with the residency scramble in the event they did not match. **Results:** This is the second year we have offered the mentoring program to graduating students. This year 55 students signed up for the mentoring process along with 16 faculty mentors. Students appear to be utilizing their mentors in varying degrees. Reports from the first year (2009-2010) were positive regarding third year students requesting this service to be offered to them. We will assess the impact of the mentoring program after the residency selection process has been completed this spring. **Implications:** A faculty-initiated mentoring program was implemented to assist our students with the increasing competitiveness of postgraduate training programs. The results of this program will be presented.

**Accelerated versus Traditional Pharmacy Programs: Does It Make a Difference for Acceptance into Residency Programs?** James W. Fetterman, South University, Gregory V. Stajich, South University, Lila Z. Macias-Moriarity, South University. **Objectives:** This study was designed to determine if residency directors/committees prefer graduates from traditional four year programs versus accelerated three year programs. **Method:** A seven question on-line survey instrument was developed and distributed to 660 Residency Directors as listed in ASHP Directory of Accredited PGY1 Residency Programs. Respondents answered a 5-point Likert questions rating the importance of the following variables: age, maturity, letters of reference, accelerated, traditional program, licensure at time residency begins, and professionalism. Additionally descriptors such as the geographic location, type of practice, the number of years as Director, if hospital-based, the number of beds, the number of years the residency has been offered, and who has the ultimate decision making authority. SPSS was used to calculate descriptive statistics and generate Wilcoxon Matched-Pairs Signed-Ranks Test to identify significant differences between residency director’s rankings of factor variables. **Results:** A total of 335 (52%) Residency Directors completed the survey. All 50 states were represented. Most residency programs (95%) were located in Healthcare Systems, University Hospitals, and Community Hospitals. Respondents rated traditional programs significantly higher than accelerated programs (p=.02) as an important factor in selecting residents. However, over 40% of all respondents were neutral or gave little importance to whether resident candidates graduated from a traditional versus an accelerated program. **Implications:** With the emergence of accelerated programs greater residency director/committee education regarding the quality of accelerated programs is needed to reduce the bias toward traditional programs and “level the playing field” for applicants from all schools of pharmacy.

**Addressing Adherence: Report of a Pilot Teaching Project with APPE Student Pharmacists in a Community Pharmacy.** Shanna K. O’Connor, University of North Carolina at Chapel Hill, Macary W. Marciniak, University of North Carolina at Chapel Hill. **Objectives:** Student pharmacists are taught to assess and encourage adherence to
medication regimens but often do not have practical experience regarding the barriers patients may face when encountering with a medication regimen. This project was designed to provide personal exposure to the issue of medication adherence. **Method:** This pilot teaching project was conducted with students completing an advanced pharmacy practice experience (APPE) at a regional chain community pharmacy. On day 1, students wrote a short essay describing their concept of and the role of the pharmacist in adherence. Each student was given a list of six medications; they considered medication-specific dosing time, interactions, and compliance with guidelines and created a medication regimen. Students drafted a physician recommendation with suggestions for regimen improvement. For days 2-9, the student pharmacists followed their medication regimen, using peanuts in place of active pills, noting any difficulties encountered. On day 9, students added 2 new medications to their regimen. On day 14, the students wrote a short reflective essay and discussed their experience. **Results:** Two students completed the pilot project. This adherence project will be conducted at other sites within the chain in April, 2011. Student statements noted they valued this exercise as they identified barriers to their own adherence and gained better understanding of patient barriers to adherence. **Implications:** Students who participate in this project may have more empathy for patients, particularly with respect to barriers to adherence. This project is easily adaptable to alternate practice sites and is applicable to other healthcare professions.

**Alcohol Attitudes and Behaviors in Pharmacy Faculty.** Lauren S. Schlesselman, *University of Connecticut*, Clayton English, *Albany College of Pharmacy and Health Sciences*. **Objectives:** Despite attempts to control college-aged drinking, binge and underage drinking continues at colleges and universities. Although often underutilized, faculty have the potential to influence these students’ behaviors and attitudes towards drinking. Little information is available pertaining to college faculty views on drinking, drinking patterns, and their influence on college drinking. What little information is available predate the economic crisis, increased mandates in alcohol education, and call for action towards alcoholism in pharmacists by the APHA. This study was designed to determine alcohol use patterns and viewpoints among faculty at U.S. colleges of pharmacy. The study was intended to identify common practices of alcohol use among faculty, use of alcohol with their students or mention of alcohol as a social norm, and perceived drinking norms within their colleagues. **Method:** Following IRB approval, 2809 invitations were emailed to U.S. pharmacy faculty to participate in a survey-based study. The survey consisted of demographic questions, the WHO Alcohol Use Disorders Identification Test to determine alcohol dependency and categorize potential alcohol abuse, and questions pertaining to personal and institutional attitudes on drinking and drinking with students. **Results:** Analysis is still ongoing. Preliminary results found 96.4% of 753 respondents had a total AUDIT score <8. When asked if their school sponsored events at which alcohol is served to faculty and students together, 45.6% reported that they did have events involving alcohol. **Implications:** The results can be utilized by schools of pharmacy and faculty to alter their approach to reducing binge and underage drinking by students.

**An Approach to Standardized Analysis of AACP Curriculum Quality Survey Data with Inclusion of Several Comparators.** Laurie L. Pylitt, *Butler University*, John Mulvaney, *Butler University*, Bruce D. Clayton, *Butler University*. **Objectives:** Develop a method for analyzing AACP Curriculum Survey results for use in program assessment and accreditation reports. **Method:** Raw survey data from two data points (years) was entered into a spreadsheet and filtered so results could be viewed by year for Butler University (BU) and its comparators (peers, all private schools, and all schools of pharmacy.) To facilitate a more uniform comparison, a series of ratios were created across years and comparators. The ratios reflected the summed positive responses (agree + strongly agree) and negative responses (disagree + strongly disagree) for BU as compared with the summed responses of each comparator group. A summary sheet was created for each question, including graphic representation of these ratios, and tabular representation of the change in intensity of responses across years and comparators. The Assessment Committee set two performance goals: 1) the positive response ratios be no less than 5% below our peers, i.e. a ratio of >.95, and 2) BU summed positive responses should be > 80%. **Results:** The Assessment Committee used the summaries to identify Program strengths and areas needing additional investigation. Any questions not meeting benchmarks were referred to the appropriate college committee for further study. A textbook included on the summary sheet was used for communication between the Assessment Committee and the referred committee regarding the findings. **Implications:** The survey analysis approach outlined here can be used by other pharmacy schools to facilitate assessment activities and to satisfy ACPE requirements for survey use.

**An Elective Course in Medication Therapy Management at the University of Montana: Two Years’ Experience.** Katherine S. Hale, *The University of Montana*, Tanner Higginbotham, *University of Montana*. **Objectives:** Describe an elective course in medication therapy management (MTM) offered to third-year pharmacy (P3) students at the University of Montana School of Pharmacy. **Method:** A 1-credit elective was designed with the primary objectives of introducing and practicing the concepts and core elements of MTM. The course was developed in 2010 to augment the current curriculum and prepare students for fourth-year advanced pharmacy practice experiences (APPEs). Class activities include lecture, case discussion, written assignments, mock interviews, and patient encounters. At the end of the course, students complete a 13-question self-assessment tool measuring: (1) changes in knowledge and skills related to key aspects of performing an MTM encounter; and (2) changes in ability to assess, identify, communicate, and resolve drug-related problems. **Results:** Ten students completed the course in 2010, and five are currently enrolled. Comments regarding the 2010 course were generally positive. Results from year one indicated an improvement in knowledge and skills in 11 of 13 categories. No change occurred in the categories of 1) assessment of cultural issues, health literacy, and characteristics affecting patient’s communication abilities; and 2) medication cost considerations. Data collection and evaluation for year two is currently ongoing. **Implications:** This elective course provides a means for students to prepare for MTM participation during APPEs and future pharmacy practice. Results of these self-assessments can provide a future basis for comparison upon APPE completion and potentially guide curricular change.

**An Evaluation of 4th Year Student Pharmacist Utilization of Portable Drug Information Resources.** Bernie R. Olin, *Auburn University*, Adam Syfrett, *Auburn University*. **Objectives:** To assess the extent of utilization of mobile drug information resources by 4th year student pharmacists; to determine the resources most commonly used, as well as the platform upon which they are accessed; to determine student attitudes towards the utilization of such resources, in both patient care and personal performance aspects. **Method:** An anonymous online survey was developed and distributed to Auburn University P4 student pharmacists via an Internet link to Qualtrics. After approximately two weeks, a follow up email and Internet link was sent to the same distribution list to increase participation. The
Qualtrics programs kept the data anonymous, collated and presented the responses to the survey. **Results:** The outcomes have not yet been tabulated, but the results anticipated will yield information concerning P4 students numbers and preferences concerning mobile electronic devices, favored interface platforms, favored information databases and student attitudes toward utilization of these devices in patient care areas as well as personal use. **Implications:** Implications are formidable for the education of student pharmacists to prepare them for their initial foray into clinical practice via clerkships. The extent of use of mobile electronic devices for accessing drug and health information will help guide earlier education efforts as to the strengths and limitations of devices, platforms and particularly databases, in the context of drug information and patient care.

**An Evaluation of Interactive Instruction and Gaming Techniques in a Pharmacotherapeutics Course.** Vincent J. Peak, Sullivan University, Erin Billingsley, Sullivan University, Trish Banet, Sullivan University. **Objectives:** 1. To determine the feasibility of incorporating various interactive instruction techniques and gaming strategies into a pharmacotherapeutics course sequence 2. To measure the level of student acceptance and summarize student critiques of incorporating various interactive instruction techniques and gaming strategies into a pharmacotherapeutics course sequence **Method:** One lecture in a pharmacotherapeutics course will be given using Prezi format, rather than the standard PowerPoint format. Lecture material in a pharmacotherapeutics course sequence will be reviewed using the, “Are You Smarter Than a 5th Grader” game format. Lecture material in a pharmacotherapeutics course sequence will be reviewed using the, “Jeopardy” game format. Different course material will be reviewed using each game. Faculty course coordinators will be surveyed regarding their opinions of these interventions and any positive or negative effects which were produced by including these interventions in their course. Pharmacy students will be surveyed regarding their acceptance of these interactive programs and asked to critique each intervention separately and as a total package. **Results:** Results are pending at this time. These interventions will be presented during the Winter and Spring Quarters at a 3-year pharmacy school which is in session year-round. **Implications:** It is well-known that there are various types of learners (visual, auditory, read-write, and kinesthetic). It is our belief that interactive educational interventions will appeal to all of these types. If these interventions are well-accepted and receive positive critiques, follow-up research will seek to measure the ability of these techniques to enhance or increase learning of course material.

**An Integration Strategy to Teach Medical Terminology.** Elizabeth A. Musil, Concordia University Wisconsin, Ernest Stremski, Concordia University Wisconsin. **Objectives:** Medical Terminology is important fundamental knowledge to build on, but curriculums do not always have room for it as a stand alone course. Our goals included: enhancement of student knowledge and retention of Medical Terminology, and integration of curricular course material across Pharmacy Practice and Pharmaceutical Science departments. **Method:** Faculty from the Pharmacy Practice Lab and the Anatomy and Physiology course worked to find integration points to teach and reinforce Medical Terminology knowledge gained within the first semester of the P1 year. A pre-test was administered to all students on the first day of classes. The body systems covered in the weekly Anatomy and Physiology lectures were matched with weekly pre-lab assigned readings. Supplemental materials were available for students to utilize via an online learning management system (ANGEL) utilized in the lab course. Students completed weekly quizzes within the Applied Patient Care Lab to verify knowledge acquisition. At the end of the semester, a post-test identical to the pre-test was administered to all students. The passing score was defined as 70% or above for all assessments. **Results:** The student performance on the end of semester post-test was significantly improved from the pre-test results. No one passed the pre-test while 80.3% passed the post-test (p value < .001). **Implications:** Students can learn and retain basic terminology with an integrated effort between Science and Practice courses within the same semester. Long-term retention will need to be evaluated with continued assessment.

**Are We Hitting the Target? A Pilot Study Exploring Differences in Perceptions of Case Difficulty.** Jeannine M. Conway, University of Minnesota, Genevieve Gauthier, University of Alberta, Angela K. George, University of Minnesota, Richard W. Brown, University of Minnesota, Solange Richard, McGill University, Susanne P. Lajoie, McGill University. **Objectives:** To compare students’ determination of case difficulty to faculty’s determinations and to analyze students’ performance in relationship to perceived and predicted case difficulty. **Method:** Four patient cases using BioWorld, a computer-based learning environment, were used for data collection. The first two cases were simple familiarizing students with the interface. Two additional cases, addressing specific drug therapy problems, were completed. The assessment of students’ problem solving performance included a qualitative analysis of treatment plans and evidence contributing to their reasoning. After case completion, participants completed a survey tool rating perceived difficulty. The survey also collected their case specific background knowledge and interest in the case subject. Faculty members predicted the difficulty level of the case for students using similar ratings. **Results:** Twenty-three 3rd year pharmacy students completed the cases and surveys. Two faculty members created and rated each case. Students’ difficulty perception was higher than that predicted by experienced teaching faculty. Analysis of students’ reasoning and argumentation revealed higher critical thinking performance than their final narratives indicate. Students’ case difficulty rating as a group is better indicator of their performance than what teachers predicted, however at the individual level factors like prior content knowledge and the case learning outcomes also appear to influence individual performance. **Implications:** The concept of case difficulty, which faculty members typically underscore, needs to be explored to design activities that assess students’ reasoning fairly. This pilot study provides some insight into difficulty perceptions. Future research will evaluate additional variables that may also impact student’s performance.

**Assessing Continued Benefit of Anti-Dementia Therapy through Monitored Medication Discontinuation in Pharmacist-Directed Telephone Dementia Clinic.** Lynda H. Oderda, The University of Utah, Bret Hicken, VA Rural Health Resource Center - Western Region, Christine Holman, George E. Wahlen Department of Veterans Affairs Medical Center, Ben Nichols, George E. Wahlen Department of Veterans Affairs Medical Center. **Objectives:** To assess continuing benefit of anti-dementia medications in patients enrolled in one VA health care system’s primary care clinics. **Method:** Clinical pharmacists and clerkship students conduct chart reviews of eligible patients taking ≥ 1 anti-dementia medication. Caregivers are contacted by telephone by clinical pharmacists who interview caregivers using a modified form of the Clinical Impression of Global Change (CIBIC) Plus Care Giver Input tool. With caregiver consent,
and in consultation with the patients’ primary care providers, patients undergo a monitored medication discontinuation trial consisting of 1-4 weeks off targeted anti-dementia drug. Caregivers use the CIBIC-Plus for monitoring. Medications are restarted immediately if a noticeable decline occurs. Results: In an ongoing expansion trial of a demonstration project, 168 patients had a formal review of their anti-dementia medications. Twenty-two monitored medication discontinuations were attempted in 168 patients. Eleven patients (50%) had no noticeable decline in cognition following medication discontinuation, while half experienced a noticeable decline in cognition and resumed taking the discontinued medication. The discontinuation rate of 50% contrasts with a reported discontinuation rate of 21% the previous year when veterans and their caregivers were making in-person clinic visits. Implications: Students gain experience in medication discontinuation in an innovative telephone clinic, and an appreciation of caregivers’ perspectives using the CIBIC-Plus tool. Short-term discontinuation of anti-dementia medications can provide information about ongoing benefits in individual patients. Higher discontinuation rates in this clinic suggest a more cost-effective model for medication discontinuation trials.

Assessing the Effect of Multiple Advanced Cardiac Life Support Simulations on Pharmacy Student Performance. Jason S. Haney, South Carolina College of Pharmacy, Sarah P. Shrader, South Carolina College of Pharmacy. Objectives: To assess the effect of multiple advanced cardiac life support (ACLS) simulations on third-year pharmacy student performance with 1) managing adult patients with bradycardia, tachycardia, and cardiac arrest; 2) preparing medications with sterile technique for use during ACLS; and 3) calculating patient-specific vasopressor administration rates. Method: The study was approved by the institutional review board of the Medical University of South Carolina. An ACLS simulation using a human patient simulator was developed for third-year pharmacy students at the South Carolina College of Pharmacy. Three days prior to the simulation, students received 2 hours of lecture reviewing the pharmacist’s role and pharmacologic agents used in ACLS. Students were divided into 26 groups of 3-4 students and assigned a 45-minute session. After an introduction and orientation, students were assigned roles including team leader/administering respirations, preparing/administering medications, and performing compressions/operating the defibrillator. The students identified and treated three scenarios: sinus bradycardia, ventricular fibrillation, and hypotension. Students rotated roles following patient stabilization with each scenario. An instructor supervised each session, graded clinical performance, and provided a debriefing session. Students were given a pre- and post-simulation written examination and survey. Eighteen students enrolled in the Acute Care Therapeutics (ACT) elective completed an additional simulation the following week without any additional formalized instruction. ACT students were reassessed for clinical performance and by written examination. Results: To be presented. Implications: The results of this study could validate the theory that repetitive simulation-based learning experiences lead to greater improvements in knowledge and its retention compared to traditional lectures.

Assessing the Utility of a Blog to Engage Students within a Psych-Pharmacotherapy Course. Melanie Foepel, Pacific University Oregon, David G. Fuentes, Roosevelt University. Objectives: A challenge in teaching psychiatric pharmacotherapy is capturing the complexities of patient care. Due to time constraints, many skills needed to perform a comprehensive evaluation (i.e. assessing the relationship between a patient’s history and current prognosis, determining the effects of personality disorders on adherence and communication) are often overlooked. To introduce these skills under the time constraints of a 2-week psych-pharmacotherapy course, we designed and implemented a psychiatric blog to engage students and enhance student learning. Method: Students were given sections of a patient’s medical history and treatment for several co-morbid psychiatric conditions. Students were then asked to post an entry that discussed a case-based therapeutic concept supported with at least one piece of evidence. Faculty moderators responded to each post daily and gave feedback regarding the content, quality of evidence, and related patient factors to consider. Students were also strongly encouraged to reflect on other individual’s posts since the course examination would include concepts discussed on the blog. Results: Faculty and student responses seem to favor the continuation of this activity. A rubric based on Fink’s taxonomy of learning will be used to analyze the content of students’ responses. Aggregate results from student responses and exam performance will be presented. Implications: Use of the progressive blog provided students the time to gain exposure to a complex psychiatric patient. Similar models may foster deeper clinical insight, strengthen student’s abilities to relate drug information to an individual patient, and expose students to the complexities of a realistic patient with mental illness.

Assessment of First-Year Pharmacy Students’ Attitudes and Performance during a Required Immunization Training Program. Timothy Gladwell, University of Maryland Eastern Shore, Kathy D. Webster, University of Maryland Eastern Shore. Objectives: The objectives of this study are to assess the attitudes of first-year pharmacy (SP1) students on providing immunizations, and to evaluate the abilities of these students to successfully complete immunization training. Method: SP1 students at the University of Maryland Eastern Shore were required to take the American Pharmacists Association immunization certificate training program as part of a mandatory, 3-credit didactic course. To successfully pass the program, the students needed to complete a self-study module and examination, attend nine hours of didactic lectures, and complete a final written and practical examination. Student attitudes toward providing immunizations were assessed with an eight question pre- and post-test. Descriptive statistics were used to report the results of each question, and comparisons of changes in survey scores were analyzed for all completed survey responses. Pass rates for the program were used as a measure of the students’ abilities to successfully complete the program. Results: A total of 63 students were enrolled during the fall term. The pass rate for the program was 100%. Evaluations of the students’ attitudes toward pharmacist-delivered immunizations after completion of the program revealed improvement in all eight measures, particularly in regards to their abilities and willingness to provide immunizations. Implications: These results indicate that SP1 students can successfully complete an immunization training program. Early introduction of this topic may increase the opportunities for students to develop these skills, while also having a positive effect on their willingness to provide immunizations.

Assessment of Overall Performance of Pharmacy Students in an Elective Sterile Products Course. Anthony L. Walker, The University of Louisiana at Monroe, Charles Jastrum, The University of Louisiana at Monroe, Roxie L. Stewart, The University of Louisiana at Monroe, Candace T. Chelette, The University of Louisiana at Monroe. Objectives: To assess overall performance in an elective sterile products course comparing second-year pharmacy students, enrolled in an integrated, modular curriculum, and having taken a required four-week parenterals course, versus third-year pharmacy students,
enrolled in a traditional pharmacy curriculum, and having not taken the four-week parenterals course. A second assessment will evaluate overall performance in the sterile products elective of individual students, with greater than six months hospital work experience, verses individual students, in the sterile products elective, with no hospital work experience. **Method:** Students enroll in Pharmacy 5016, Sterile Products. The course is designed to provide students with an introduction to aseptic techniques, parenteral preparation and preparation of other sterile products, including total parenteral nutrition and chemotherapy. Throughout the course, students are observed and graded on aseptic techniques, appropriate final products, professional demeanor, and written examination. A survey instrument will be used to collect data pertaining to hospital work experience and whether or not the student completed the four-week parenterals course. **Results:** Overall grades will be assessed at the end of the semester. Each student taking the elective class will be asked to complete a course evaluation at the completion of the course. **Implications:** It is our hypothesis that second-year pharmacy students enrolled in an integrated, modular curriculum and having taken a required four-week parenterals course will perform better overall in an elective sterile products course, verses third-year pharmacy students, enrolled in a traditional pharmacy curriculum, and having not taken the four-week parenterals course.

**Assessment of Patient Care Lab Training on the Effectiveness of Student Interprofessional Communication Skills.** Stacy Taylor, *University of Kentucky*, Craig A. Martin, *University of Kentucky*, David J. Feola, *University of Kentucky*, Mikael D. Jones, *University of Kentucky*. **Objectives:** To determine whether interprofessional communication lectures and Patient Care Lab (PCL) activities impact student interprofessional communication skills. **Method:** Although interprofessional communication is taught early in the curriculum, we set out to evaluate the impact of additional lecture/lab activities during the PCL courses on interprofessional communication skills of third-professional year (PY3) pharmacy students. Lab instructors added interprofessional communication content to lectures and various lab activities when possible throughout the PY3 year. A mock interprofessional communication exercise was conducted before (early Fall 2010) and after (late Spring 2011) the augmented lecture/lab activities. The exercises were conducted in the context of timed, videotaped lab course exams (PPEs) and required students to: 1) incorporate concurrent therapeutics materials to develop a drug therapy recommendation 2) verbally communicate the recommendation to a mock physician. Pharmacy faculty/preceptors served as mock physicians and evaluated the students using an interprofessional communication rubric developed for this activity. Rubric scores from the two exercises will be compared between the two PPEs to determine the impact of the augmented lecture/lab activities on student communication skills. **Results:** Data analysis is ongoing and will be presented. **Implications:** Results will determine if the interprofessional communication lectures and PCL activities impacted student interprofessional communication skills. Future research will be conducted to determine whether these lecture/lab activities impact the quality of student interprofessional communication during APPE rotations.

**Assessment of Pharmacists’ and Pharmacy Students’ Perceptions of Clinical Pharmacy.** Katie Yabut, *Oregon State University*, Ann Zweber, *Oregon State University*. **Objectives:** To determine the perceptions of clinical pharmacy among pharmacists and pharmacy students. **Method:** Surveys of pharmacy students and pharmacists from the state of Oregon will be conducted to determine their definition of clinical pharmacy and the work setting of a clinical pharmacist. The survey and methods have been approved by IRB, and have been intentionally designed as paper surveys administered with limited time for completion, to allow participants to only include their immediate thoughts on the topic. The survey will elicit basic demographic information and ask two open ended questions: “What is the work setting for a clinical pharmacist?” and “What does a clinical pharmacist do?” Responses will be sorted based on year of pharmacy education (pre-pharmacy, P1, P2, P3, and P4) and pharmacy practice site. Responses will be reviewed for common terms used in the responses to quantify information provided. **Results:** Results of this study will describe variations in perceptions of clinical pharmacy between different levels of pharmacy education, and pharmacists years of experience and practice sites. **Implications:** ACCP’s abridged definition of clinical pharmacy is “that area of pharmacy concerned with the science and practice of rational medication use.” Students and practitioners often use the term “clinical pharmacy” to mean a variety of practices in a variety of sites. The results of our survey will articulate the various perceptions of the term, and identify if there is a need for more education and clarification of the practice of clinical pharmacy.

**Barriers to Completion of Electronic Teaching and Course Evaluations in a Professional Pharmacy Program.** Jessica M. Cottreau, *University of Houston*, Catherine L. Hatfield, *University of Houston*. **Objectives:** Low rates of response to current electronic teaching and course evaluations make it difficult to identify areas of improvement. Identifying students’ attitudes and barriers to completing these may help to improve accessibility and response to such evaluations. The objectives are to identify student attitudes toward electronic teaching and course evaluations and their barriers to completing them. **Method:** All students at the University of Houston College of Pharmacy will be given a voluntary survey. This survey will be given in person by a faculty member at the end of a scheduled class time. Attitudes and barriers to course-related issues and teacher-related issues will be collected. Data will be analyzed by class, student age, prior work experience, and anticipated pharmacy career path. **Results:** The survey will be completed by students in February 2011. Full results of this survey will be presented at the meeting. **Implications:** Identifying student attitudes and barriers to completing both course and teacher evaluations may give guidance on new ways to request these evaluations, and thus help the faculty gain insight on how to improve their courses and teaching methods.

**Campus-Community Partnership: Educational Outreach for Urban Indigent Patients with Diabetes.** John M. Conry, *St. John’s University*. **Objectives:** The primary objective of this project is to assess the impact of pharmacist-led diabetes education and distribution of free glucometers/test strips on uninsured patient’s diabetes knowledge, glycemic control and diabetes management. A secondary objective is to assess the health literacy of this special patient population. **Method:** The study protocol was approved by all necessary IRB’s. This prospective research project is taking place at an urban FQHC which is an experiential partner of the College. Patients are eligible for inclusion in this project if they are uninsured adult patients (> 18 years of age) with diabetes mellitus and have received diabetes care at the specified FQHC. Patients will have a hemoglobin A1C, diabetes knowledge test, and health literacy assessment completed at baseline. All participants will receive pharmacist-led one-on-one diabetes education and tools for self-management of diabetes. Patients will be prospectively followed for a total of 6-months. The primary endpoints (comparing baseline to the end of study) include:
hemoglobin A1C and results of diabetes knowledge test. Results: Data is currently being collected. Implications: The goal of this project is to identify a new and innovative method to improve diabetes management within this critical and typically underserved patient population. This project may stimulate further pharmacist involvement and advocacy for this marginalized population. This serves as a unique opportunity for a campus-community partnership to optimize the care for the urban indigent.

Changes in Pharmacy Students’ Empathy and Attitudes toward the Medically Underserved Population during Pharmacy School. Eunice P. Chung, Western University of Health Sciences, Suzie Kovacs, Western University College of Veterinary Medicine. Objectives: Empathy and caring attitudes are critical components of a competent health professional. The objective of the study is to evaluate the changes in pharmacy students’ empathy and attitudes toward the medically underserved population during their four years in pharmacy school. Method: Students enrolled in the doctor of pharmacy program during the academic year 2010 - 2011 were invited to complete a survey. The survey consists of 2 validated tools: the, Jefferson Scale of Empathy (JSE) and Medical Student Attitudes Toward the Underserved (MSATU). Each tool was adapted to the pharmacy profession. Level 1 students completed the survey upon entry into the program and will serve as the baseline data. The second phase of the survey was completed by level 3 students prior to entering the advanced pharmacy practice experience. The last phase of the survey will be completed by the level 4 students just prior to graduation. The responses for the 3 groups will be compared to evaluate any changes in empathy and attitudes toward the underserved during the doctor of pharmacy program. Longitudinal data collection will continue in future academic years to monitor changes in the student population. Results: Data analysis and results will be available upon completion of the initial data collection at the end of the academic year. Implications: Empathy and caring attitudes are important but difficult to teach. The results will indicate whether the pharmacy curriculum is addressing these components either through direct or hidden curriculum.

Communication of Clinical Recommendations during Cardiovascular Therapeutics Oral Examinations. Lisa M. Lundquist, Mercer University, Kathryn M. Momary, Mercer University, Angela O. Shogbon, Mercer University. Objectives: To compare students’ self-assessment and faculty evaluation of communication of clinical recommendations during therapeutics oral examinations. Method: Two patient case-based oral examinations (one individual and one in groups of 4 students) were given to all second-year pharmacy students enrolled in the Cardiovascular/ Renal III therapeutics course for two consecutive years. Students were provided with patient cases prior to each oral examination. In addition to evaluation of pharmacotherapy knowledge, faculty evaluated students’ communication skills using a scoring rubric. Immediately following each oral examination, students self-assessed their communication skills using the same rubric. This study was approved by the IRB and students signed informed consent prior to participation. Students’ self-assessments were compared to faculty evaluation of their communication skills using descriptive statistics and paired t-tests. Results: A total of 136 (97.8%) students completed communication self-assessments following each oral examination in year one. Faculty evaluations in both the individual and group oral examinations were statistically significantly higher than the student self-assessments (p<0.001 for both). Students’ self-assessment of communication increased from the individual examination to the group examination (p<0.001). During spring semester, year two data will be collected, evaluated, and compared to year one. Implications: Students’ self-assessment of communication skills were consistently lower than the evaluation scores provided by faculty. A potential cause of students’ lower self-assessment may be a lack of practice in the verbal communication of clinical recommendations, which is supported by the increase in student self-assessment with the second oral examination.

Comparative Evaluation of Data Extraction by Student Pharmacists: Electronic Medical Record versus Traditional Paper Chart. Krista Capehart, University of Charleston, Julie A. Testman, University of Charleston, Michael O’Neil, University of Charleston, Pam Scott, Wheeling Jesuit University-HealthWV, Titus Che, University of Charleston, Beth Marker, University of Charleston, Mariana Torres, University of Charleston, Nancy Tran, University of Charleston. Objectives: Medical technology has evolved from paper charts to electronic medical records (EMR). In healthcare environments, student pharmacists will encounter both systems. This study will evaluate the accuracy and efficiency of data extraction by student pharmacists from electronic versus paper medical records before and after EMR training. Method: The Patient Assessment course is divided into two sections. Each section was allotted fifteen minutes to complete a comprehensive ten question data extraction assessment. Section one utilized a statewide EMR (HealthWV) without training; section two utilized a paper chart. Following 2 hours of EMR training, students were re-evaluated using the HealthWV system. Efficiency was measured by self-reported completion time; accuracy was assessed through number of correct responses. Results: Twenty-two percent of section one reported prior EMR experience compared to 26% of section two. Pre EMR training, section one recorded a 12.97 minute average completion time and mean of 7.56 correct responses. Section two recorded an 8.84 minute average completion time and mean of 7.43 correct responses. Final Student extraction assessment will be completed at the end of the course. Implications: EMR training and utilization may have significant impact on student efficiency or accuracy of data extraction in clinical practice. This study demonstrates the ability to apply advances in medical technology throughout the pharmacy curriculum. Integration of EMRs in the classroom will optimize student training in preparation for advanced pharmacy practice experiences and post-graduate opportunities.

Comparison of HSRT Results Between Students with Degrees Prior to Pharmacy School versus Only Pre-Requisites. Kimberly K. Daugherty, Sullivan University, Hieu T. Tran, Sullivan University. Objectives: The California Health Science Reasoning Test (HSRT) is commonly used by Health Sciences programs to test critical thinking in our students. HSRT results are broken into a total exam score and then individual scores on analyze, inference, evaluation, induction, and deduction. This poster will compare student HSRT results for students who have obtained a degree prior to starting pharmacy school (associate degree and above) to those who complete only pre-requisite courses. Method: Students currently take the HSRT exam during the first month of their first year at our college of pharmacy. When taking this exam students self report whether than have obtained a degree prior to entering our program. Scores were compared for each Class as well as total for each component of the HSRT exam to determine if there were any differences. Results: A total of 252 students (3 classes) have taken the HSRT. Students with a degree have shown lower scores on all components of the HSRT compared to those without a degree. p-value was statistically significant only for the difference in total score. Students with a degree had a total score of 20.8 versus 22.1 for students without a degree (p=0.032). The
Implications: Pharmacy curriculum’s require critical thinking and 2008 national average for graduate students on this exam was 23.5.

Comparison of Student Self-Evaluations and Instructor Evaluations in a First Year Applied Patient Care Skills Course. Andrew P. Traynor, Concordia University Wisconsin, Elizabeth A. Musil, Concordia University Wisconsin, Michael C. Brown, Concordia University Wisconsin. Objectives: 1) Increase student awareness of evaluation criteria; 2) Introduce students to self-evaluation of patient care skills; 3) Compare student self-evaluation to instructor ratings for skill performance. Method: Applied Patient Care II is the second of six integrated patient care skill courses in the Concordia University Wisconsin School of Pharmacy curriculum. The course uses simulated patient scenarios to build students’ foundational skills including patient assessment, care plan development, and patient education. The course utilizes an online grading rubric system to evaluate and track student performance. The system has the capability to allow students to self-evaluate performance. The system is utilized in conjunction with video software that allows for recording and later viewing of student performance. Once a skill has been introduced and evaluated by instructors, students are asked to complete self-evaluations in subsequent skill performance activities. Results: Seventy-one students are enrolled in the first offering of the course. Student self-evaluations are planned to be completed for activities including medication list reconciliation, patient education, patient assessment, and care plan delivery to a patient. Students will be questioned on their awareness of performance evaluation components and perceived ability to self-evaluate via course evaluations. Comparisons between instructor and student self-evaluations will be completed at the end of the semester. Implications: Fostering student self-evaluation early and often in the pharmacy curriculum may contribute to enhanced student performance, foster self-reflection in practice, and assist instructors in identifying differing perspectives related to student performance.

Comparison of Performance on Written and Oral Examinations to Communication Skills: Two Years Experience. Angela O. Shogbon, Mercer University, Lisa M. Lundquist, Mercer University, Kathryn M. Momary, Mercer University. Objectives: To compare performance on knowledge-based examinations to faculty evaluation of communication skills. Method: A patient case-based oral examination was given to all P2 students enrolled in the cardiovascular therapeutics course in addition to traditional written examinations. Students were provided with a patient case 24-hours prior to the oral examination to allow adequate preparation time and incorporated information previously tested in written format. In addition to evaluation of pharmacotherapy knowledge on the oral examination, faculty used a standard rubric to assess students’ communication skills in the areas of rapport (confidence, non-verbal, tone of voice, eye contact) and presentation of therapeutic recommendations (concise, pronunciation, well-prepared, patient-focused). Students’ performance on the written and oral examinations were compared to faculty evaluation of their communication skills using descriptive statistics, 2-way ANOVA, and Pearson’s correlation. Results: In year one, a total of 136 (97.8%) students provided informed consent for participation. A positive correlation was seen between performance on the oral examination and mean faculty communication evaluation scores ($r=0.59$, $p < 0.001$). Little correlation was seen between written exam scores and mean faculty communication evaluation scores ($r=0.169$, $p < 0.05$) and between written and oral exam scores ($r=0.236, p < 0.001$). During spring semester, year two of the written and oral examinations will be administered and evaluation of communication skills will be completed. Implications: Success as a pharmacist requires both therapeutics knowledge and effective communication skills. Identification of potential disparities between knowledge and communication skills may lead to a broader curricular focus on oral communication in therapeutics courses.

Complementary and Integrative Medicine: Developing and Assessing a Hands-on Elective Course of Complementary and Alternative Medicine. Jennifer A. Campbell, Appalachian College of Pharmacy, Leah Hollon, Appalachian College of Pharmacy, Craig R. Mullins, Appalachian College of Pharmacy. Objectives: To design and implement assessment instruments for a Complementary and Alternative Medicine elective semester course for second year doctor of pharmacy students at the Appalachian College of Pharmacy (ACP). Method: Upon graduation, approximately 80% of ACP students transition into being one of the most accessible healthcare professionals, the community pharmacist. Knowledge in conventional and alternative traditions is essential to provide appropriate patient lifestyle counseling. In response to community needs for information about these traditions, the “Integrative Medicine” elective course was created and implemented in 2008. The course focuses on preventing disease and implementing healthier lifestyles through Western and Eastern Medical traditions using hands-on experiential exercises. Informal assessment has been implemented in the past; however, formal assessments are necessary. In response to this need, two pre- and post-10-item survey instruments using a 5-point Likert scale were designed and administered to 14 students within the course assessing personal knowledge and confidence of Complementary and Alternative Medicine. Both surveys were based on course specific core objectives and competencies, covering Eastern and Western traditions in relation to diets, pharmacognosy and botanical medicine compounding. Results: A paired-group t-test was performed on the first of the two instruments showing statistical significance on all ten items measured between pre and post surveys ($p<0.05$). For example, students’ ability to read and choose the best nutritional products increased between pre (mean $3.21$, $\pm 0.975$) and post survey (mean $4.07$, $\pm 0.475$) ($t=-2.917$, $p<0.012$). Implications: An Integrative Medicine elective course positively impacted student learning of various cultural traditions providing a diverse skill set for tomorrow’s pharmacists.

Coordination of Patient Care Lab with Pharmacy Management Course Topic of Performance Appraisal. Stacy Taylor, University of Kentucky, Anne Policastro, University of Kentucky, Jeff J. Cain, University of Kentucky, Mikael D. Jones, University of Kentucky. Objectives: To determine whether collaboratively designed lecture and lab activities impact peer-to-peer constructive feedback during performance appraisal. To determine whether collaboratively designed lecture and lab activities impact student confidence in providing and receiving constructive feedback. Method: Third-professional year (PY3) pharmacy students are assigned to 4-member teams for their fall and spring semesters of the Patient Care Lab (PCL) course. Students individually submit peer assessments for each member of their team four times throughout the year (mid-point and end-of-semester fall and spring). It was noted that the students lacked the ability to provide useful constructive feedback. The PCL and Pharmacy Management instructors collaborated to redesign lectures with active learning components in pharmacy management and add a coordinating lab
activity on the process of giving and receiving appropriate feedback. The constructive feedback portions of the peer assessments from Fall 2010 will be compared with those from Spring 2011. Two independent evaluators will review the peer feedback for the four evaluation periods to determine whether the quality of constructive comments changed following the collaborative lecture/lab series. Additionally, data from a questionnaire regarding student confidence in providing/receiving feedback pre/post the activity will be analyzed. Results: Data analysis ongoing and will be presented. Implications: Results will determine if the collaboration yielded positive results regarding students’ ability to provide and receive constructive feedback. Future research will be conducted to determine whether this lecture/lab series impacts the quality of student feedback regarding APPE rotations.

Correlating PCAT Scores with Pharmacy GPA in the Didactic Phase of the Pharm.D. Curriculum. Megan E. Thompson, The University of New Mexico, Krystal McCutchen, The University of New Mexico. Objectives: To compare students’ PCAT scores with their pharmacy GPA in the didactic phase of the Pharm.D. curriculum. Method: For current students, PCAT percentile ranks from their Pharm.D. application and GPA’s for each of the first six semesters of the Pharm.D. program were compiled. These two sets of data were compared and overall academic student performance was determined by GPA. Results: Initial data shows that current 4th-year (graduating) students who scored in the 99th-90th percentile on the composite portion of the PCAT, had an average overall pharmacy GPA of 3.44. Students who scored below 30th percentile on the composite portion of the PCAT, had an average GPA of 2.9. Additionally, further investigation is underway to determine what PCAT percentile score results in the highest overall pharmacy GPA. Comparisons of each of the PCAT categories (Verbal, Reading, Quantitative Ability, Chemistry and Biology) versus overall GPA is in progress. Implications: Preliminary data indicates that students who scored in the upper percentile ranks on the PCAT did not necessarily perform better than students who scored lower on the PCAT during the didactic phase of the Pharm.D. curriculum. More investigation is warranted to determine a minimum PCAT requirement for admission.

Correlation of Student Self-Assessment of Program Outcomes with Course Grade Averages. Kimberly K. Daugherty, Sullivan University, Meghan M. Bodenberg, Sullivan University, Maria Lourdes Ceballos-Corinel, Sullivan University, Hieu T. Tran, Sullivan University. Objectives: As part of the College of Pharmacy Program Assessment Plan students are required to self assess their attainment of the program outcomes mapped to the courses completed in a respective quarter. This poster is to report whether students’ self assessment rankings correlate with the average grades obtained in the courses for that quarter. Method: Students are required to rank their attainment of the program outcomes completed in a respective quarter on a three point scale (novice, progressing, and competent). The students’ individual scores are averaged together and compared to the SUCOP benchmark rankings for that outcome. This score will then be compared with the respective GPA that students achieved for that same quarter. Results: Student self assessments are currently available for Fall-Spring Quarter of the first professional year (PY1) and Summer-Spring Quarter of the second professional year (PY2) for the Class of 2011, PY1 Summer-Spring Quarters and PY2 Summer-Fall Quarter for the Class of 2012 and PY1 Summer-Fall Quarter for Class 2013. For the PY1 year students ranked themselves at or above the SUCOP benchmark ranking for 17/25 program outcomes. For the PY2 year students ranked themselves at or above the SUCOP benchmark ranking for 19/25 program outcomes. Further results analysis is pending. Implications: Student self assessment of program outcomes is an important component of the COP’s program assessment plan. These results will be utilized by the assessment and curriculum committees to make appropriate changes to the curriculum and faculty teaching methodologies as needed.

Critical Literature Evaluation: Student Preparedness Before and After Advanced Pharmacy Practice Experiences. Kathryn M. Momary, Mercer University, Lisa M. Lundquist, Mercer University. Objectives: To compare students’ performance and perceptions of preparedness to critically evaluate literature before and after advanced pharmacy practice experiences (APPEs). Method: A perception of preparedness questionnaire and a knowledge assessment were distributed to the students before APPEs began and after APPEs were completed for two consecutive years. The knowledge assessment (9-question multiple choice quiz) and preparedness questionnaire (4-point Likert scale with 1 = extremely unprepared and 4 = extremely prepared) consisted of questions related to core knowledge and application of critical literature evaluation. Data collection for this study was approved by the Institutional Review Board and students signed informed consent prior to participation. Students’ perceptions of preparedness and performance before and after APPE were compared with descriptive statistics and Pearson’s correlation; pre- and post-APPE data were compared with paired t-test. Results: In year one, one hundred three students (71.5%) consented for participation and completed all pre- and post-APPE perception of preparedness questionnaires and knowledge assessments. The perception of preparedness mean (SD) increased significantly from 2.23 (0.48) pre-APPE to 2.95 (0.42) post-APPE [p<0.001]. Knowledge assessment also increased significantly from 56.2% (17.6%) pre-APPE to 60.5% (15.8%) post-APPE [p=0.035]. There was a statistically significant correlation between the pre- and post-APPE knowledge assessment and perception of preparedness (p<0.001 and p<0.001, respectively). Year two data will be collected and presented. Implications: Through clinical experiences during APPE, students’ perceptions of preparedness and knowledge of critical literature evaluation statistically significantly improved. Increased review of critical literature evaluation during APPE will likely further improve student performance.

Cross-Campus Collaboration to Develop a Mobile Learning App for Pharmacy Students. Forrest Batz, University of Hawaii at Hilo. Objectives: To develop, through cross-campus collaboration, a mobile App to aid first professional year pharmacy students in learning basic Top 200 Rx drug information. Method: A COP-selected team of software engineering students from the Department of Computer Science is developing an App which allows the user to view a variety of drug attributes and hear the pronunciation of drug names. Teams of pharmacy students were recruited to identify and enter the drug information into the App database. The App is currently under development and testing, to be completed by May 2011. Results: Upon selecting a drug name, the App displays a screen with icons representing the available drug attributes. The user can navigate between attributes, much like flipping through a set of flash cards. Multiple “decks” of “cards” can be generated and stored. A quiz mode allows the user to test their knowledge based on selection of any/all drug attribute criteria amongst all, or any subset, of the drugs in the database. Quiz results are reported statistically and stored for future review. The completed App will be distributed for use to the incoming class of 2015. Satisfaction and utility will be evaluated by survey, drug knowledge will be evaluated by course examination. Implications: Cross-campus collaborations allow access to expertise outside the field of pharmacy to aid in the development of
learning tools specifically designed to enhance education of pharmacy students.

**Current and Prospective Student Pharmacist Interest in a Rural Health Pharmacy Curriculum.** Shanna K. O’Connor, University of North Carolina at Chapel Hill, Jeffrey Reichard University of North Carolina at Chapel Hill, Macary W. Marciniak, University of North Carolina at Chapel Hill, Stefanie P. Ferreri, University of North Carolina at Chapel Hill, Pamela U. Joyner, University of North Carolina at Chapel Hill, Stephen M. Caiola, University of North Carolina at Chapel Hill. **Objectives:** New strategies are needed to solve manpower issues associated with the delivery of quality healthcare to rural communities; a school of pharmacy may be able to address this issue via a rural health focused pharmacy curriculum. This project will determine current and prospective student pharmacist interest in rural health. **Method:** This prospective, web-based, Institutional Review Board-approved survey was conducted at a school of pharmacy in a public, research-intensive university. Current Doctor of Pharmacy (PharmD) students and applicants selected to interview for fall 2011 enrollment were invited to participate. Email addresses were obtained from the Office of Student Services. Consent was implicit in participation, was voluntary and had no effect on school standing or application status. The 17-item survey was conducted via SurveyMonkey. A three-week time block was given for survey completion, with a reminder e-mail sent one week prior to the survey’s closing date. Questions address participant interest and willingness to participate in a pharmacy curriculum focused on the needs of patients in rural areas; interest in practicing in a rural area, and beliefs relating to patient access to healthcare in rural areas. **Results:** Survey invitations were sent to approximately 550 individuals. To date, 100 responses have been received. All responses are anticipated by March 15, 2011. **Implications:** The pharmacy school will use survey data in the design of the Rural Pharmacy Health Program within its PharmD curriculum. The data may be useful in determining the need for rural health curriculums at other educational institutions.

**Curricular Assessment of Pharmacokinetic Skills Using an Objective Structured Clinical Examination Requiring Targeted Note Generation.** Glenn Anderson, Texas Tech University Health Sciences Center, Krystal Haase, Texas Tech University Health Sciences Center, Sherry Luendtke, Texas Tech University Health Sciences Center. **Objectives:** To assess degree of curricular success in developing student skills in pharmacokinetic calculations and targeted note writing. **Method:** During curricular revision, clinical faculty identified skills in pharmacokinetic calculations and written communications as weaknesses of P3 and P4 students. An objective structured clinical examination (OSCE) was developed to assess these skills. During the OSCE, students were provided a miniature patient chart and required to generate a pharmacokinetic consultation. Grading of the OSCE was rubric-based and performed by trained faculty. The assessment required students to calculate the elimination rate constant (Ke), half-life, volume of distribution (Vd), dosage interval, and to recommend a new dosage based upon student-derived targets for drug serum concentrations. The OSCE deliverable was a targeted progress note. **Results:** Eighty-seven P4 and 119 P3 students completed the assessment. P3 and P4 pass rates upon the writing skills OSCE domain were similar (78.9% vs. 83.9% respectively, p=0.359). Overall, students had difficulty performing basic pharmacokinetic calculations of dosage interval (57.3%) half-life (52.4%), Ke (47.1%), and Vd (36.9%). A significant difference in P3 and P4 performance was observed in the calculation of half-life (47.9% vs. 58.6% respectively, p < 0.0005). **Implications:** Overall, students performed below expectations. Targeted curricular improvements are being implemented and include standardization of pharmacokinetic calculation strategies across all pertinent APPEs, restructuring of pharmacokinetic course sequencing, and most notably, development of a therapeutic drug dosing course with an application-based focus.

**Curricular Wide Student Portfolios Documenting Progression and Achievement of Curricular Outcomes: A Pilot Project.** Pamela L. Stamm, Auburn University, Kristen L. Helms, Auburn University, Brent Fox, Auburn University, Karen Marlowe, Auburn University, Sharon McDonough, Auburn University, Lynn Stevenson, Auburn University, Vishnu Suppiramaniam, Auburn University, Sarah Anne Swann, Auburn University, Laurie VanDeventer, Auburn University, Jordan Garrison, Auburn University, Selena Day, Auburn University. **Objectives:** 1. Develop a curriculum wide student portfolio documenting progression and achievement of curricular outcomes 2. Assess the sustainability of the proposed portfolio course 3. Evaluate the effectiveness of current guided questions 4. Appraise the quality of task versus outcomes oriented reflections 5. Compare the designed curriculum with the experienced curriculum **Method:** Student volunteers across four professional years were given the school’s eight curricular outcomes further defined by tasks pharmacists perform upon outcome achievement and a set of the same guiding questions. First and second year students reflected on each outcome’s tasks individually, whereas, third and fourth year students reflected on the entire outcome while considering the tasks. Students described how the learned curriculum helped them grow toward task/outcome achievement. They reported the skills they acquired; identified the courses, assignments, and other professional activities that enabled them; indicated if a task/outcome was not addressed; and tracked their time. Students and faculty will be surveyed to identify the benefits of the portfolio and opportunities for improvement. Descriptive statistics will be used to describe time required to complete and evaluate the assessment, assess reflection quality, describe reflection size, and compare the school’s record of courses mapped to outcomes to the courses students identified as promoting task/outcome achievement. **Results:** Pending **Implications:** Results will give insight to the effectiveness and sustainability of the proposed portfolio and will be used to recommend changes in the course as currently proposed. This portfolio course can serve as an example method for curriculum wide portfolio implementation since few exist.

**Design and Implementation of an Elective Course on the Pharmaceutical Industry.** Bobby C. Jacob, Mercer University. **Objectives:** To design and implement an elective course that focuses on providing Doctor of Pharmacy students the opportunity to learn and apply skills unique to practice settings in the pharmaceutical industry. **Method:** This semester long elective course is open to second and third year Doctor of Pharmacy students. Guest lecturers representing eight pharmaceutical companies are invited to provide didactic instruction on career functions specific to the industry. Topics include principles of promotional review, industry based drug information, translational medicine, publication strategy, health outcomes, medical affairs, principles of marketing, and industry perspectives on managed care. Specific active learning projects assigned to students include group presentations evaluating television direct to consumer (DTC) advertisements, group presentations to a mock managed care panel regarding newly approved pharmaceutical products, drug information responses to medical inquiries regarding branded products, group participation in a computer based drug development simulation, leadership panel discussion, and online reflective quizzes. These activities were designed to allow students to apply concepts that are

---


discussed during didactic lectures. Results: Eight students enrolled in the course. Grading is based on attendance, completion of online reflective quizzes, and participation in active learning projects. Course evaluation survey results from students and guest lecturers regarding perceptions of the course content will be reported. Examples of specific active learning projects will be described. Implications: The course highlights opportunities for pedagogical research specific to the role of the pharmaceutical industry within Doctor of Pharmacy curriculum. Development of valid assessment tools will facilitate improvements in educational quality of the course.

Determining Core Competencies to be an Advocate for Pharmacy via a Modified Delphi Process. Andrew S. Bzowyckyj, University of Minnesota. Kristin K. Janke, University of Minnesota. Objectives: To determine the competencies that PharmD graduates must have in order to be an effective life-time advocate for the profession. Method: A consensus position will be obtained from a modified Delphi procedure using a panel of approximately 10-12 experts identified via their publication record on advocacy in pharmacy. The Delphi procedure will consist of three rounds. Each round will include an online survey with aggregated group responses from previous rounds. The first round will introduce a working definition of “advocacy for a profession” and provide the opportunity to support or refute individual elements. In subsequent rounds, the panel’s opinions and feedback on the working definition will be incorporated. In addition, expert opinion on the characteristics, attributes and actions of the advocate will be obtained. Gathering consensus around these various elements will form the foundation for work focused on competencies in the last two rounds. Results: A working definition of “advocacy for a profession” has been developed. Upon completion of the Delphi process, characteristics/attributes and actions of the advocate will be defined along with the expert-perceived importance of each characteristic/attribute and action. Knowledge and skill related competencies will also be defined, with a rank of each competency’s importance in becoming an effective advocate for the profession. Final results will be presented. Implications: Once a consensus on core competencies can be achieved, subsequent research will be conducted to determine ideal ways to instill the agreed-upon competencies in future pharmacists; either through the PharmD curriculum, post-graduate training, and/or by other means.

Development and Implementation of a Collaborative Interprofessional Learning Program. Condit F. Steil, Belmont University, Paige S. Akers, Lipscomb University, John R. Thompson, Lipscomb University, Mark J. Chirico, Belmont University. Objectives: Belmont University School of Pharmacy and Lipscomb College of Pharmacy partnered with Vanderbilt University Schools of Medicine and Nursing, and Tennessee State University College of Social Work, as part of a Macy Grant funded pilot educational program to produce a longitudinal experiential curriculum for interprofessional learning. Method: Faculty from each of the participating schools worked collaboratively to create classroom and clinic learning experiences to overlay the students’ professional courses at their respective institutions. Blended competencies were developed as the guide for structuring the pedagogical aspects of the patient care experience. Twenty-nine first professional year students at their respective institutions began as a cohort in July 2010 with a two-week long immersion course that served as a leveling platform for interprofessional learning and community outreach. Weekly seminar sessions for the entire cohort and an ambulatory clinic experience for teams of four distinct interprofessional students at multiple sites began in August. Results: The seminar experience focused on health care access, public health and quality improvement. The clinic experience consisted of team participation in a pre-brief session followed by directed patient care activities and finally a team de-briefing that summarized accomplishments and identified learning issues. Students’ learning is directed by the blended competencies plus an Individual Learning Plan (ILP) that they prepared at the beginning of the semester. Students completed a self-assessment in December and met with faculty to receive expert feedback on their performance. Implications: We will share our involvement with this pilot program and evaluate the potential impact of more interprofessional learning in pharmacy education.

Development and Implementation of a Post-Doctoral Academic Pharmacy Fellowship. Kenneth C. Jackson, Pacific University Oregon, Brad S. Fujisaki, Pacific University Oregon, Nathan Shiman, Pacific University Oregon. Objectives: Describe the process and results from developing and implementing a new academic pharmacy fellowship. Method: Our School was able to secure funding to initiate a 12-month long academic pharmacy fellowship program to begin with the 2010-11 academic year. This program was designed to provide an opportunity for those interested to seek training that would facilitate becoming productive members of the pharmacy academy. Fellows would be expected to participate in all facets of academic life, including scholarship, service, teaching and an academic clinical practice where appropriate. Results: To date the fellow has been involved in multiple courses in our program, and participated in the local residency teaching certificate program. This has included 60 hours of group facilitation and 11 hours of classroom instruction. The fellow has received significant feedback and mentoring regarding their instruction, as well as the opportunity to provide feedback and critique of faculty instruction. The fellow will have presented 2 poster presentations and submitted 1 manuscript by the end of the fellowship. The fellow has also been on 3 committees at the School level, in addition to being active in various professional organizations. Implications: The growth in existing and new pharmacy schools has resulted in a shortage of prepared pharmacy faculty members. Most traditional pharmacy training programs do not provide significant training or development to those interested in pursuing a career in pharmacy education. This program is designed to provide aspiring academicians with an opportunity to attain a solid foundation for an academic pharmacy career.

Development and Implementation of a Process to Qualitatively and Quantitatively Assess Student Initiated Community Service Events. Jennifer A. Campbell, Appalachian College of Pharmacy, Paul Gavaza, Appalachian College of Pharmacy, Leah Hollon, Appalachian College of Pharmacy. Objectives: Doctor of Pharmacy students at the Appalachian College of Pharmacy complete 150 hours of community service as a requirement of graduation. The hours are completed primarily through three methods, one of which is student initiated and organized events. In early 2011, focus was placed on assessing this method. As a result, a process, described in this study, was designed and implemented. Method: Both quantitative and qualitative assessments are needed to fully evaluate these events. Quantitative assessment requires analyzing a subset of data already being collected. However, in order to assess the quality of the events, two 15 item surveys were developed and refined by defining objectives for assessment, brainstorming the survey items, specifying the target population, checking face validity and pilot-testing the surveys. The “Event Supervisor Survey” is given to the faculty member(s) or community healthcare member(s) supervising the students. The “Community Participant Survey” is given to a minimum of two community members served by the event per hour the event is conducted.
Results: Both surveys were pilot tested during the Healthy Heart screening where a convenience sample of sixteen community members and four event supervisors completed the surveys. Respondents took an average of six minutes to complete the survey and most found the survey easy to understand. Face validity was checked by pharmacy practice faculty and community members. Implications: Data collected from these surveys will be used to assess the impact of the student initiated and organized events on the community and to guide improvements on future events.

Development and Assessment of an Interprofessional Management of Palliative Care Patients Elective. Scott S. Wisneski, Northeast Ohio Medical University. Objectives: To design, implement and assess an elective course that introduces the pharmacy student to the nature and principles of palliative care, emphasizing the role of the pharmacist as part of an interprofessional team managing patients. Method: The elective was developed, focusing on the basic principles of palliative care, symptom management, pediatric and geriatric palliative care, ethical and legal issues, and role of the pharmacist on an interprofessional team. The course format included didactic lectures, case studies, peer teaching, and site visits to observe a palliative care team. In the second year of the elective, enrolled students completed an on-line pre- and post survey assessing knowledge and perceptions of palliative care. An overall course evaluation was also completed by the students. Results: All twenty-one (21) students enrolled successfully completed the elective. Eighteen (18) students completed both the pre- and post course surveys. All the students felt the course provided a positive contribution to one educational experience. Seventeen (17) of the students would recommend the course to future pharmacy students. Improvement in student’s knowledge of palliative care particularly in the area of pain and symptom management increased. Perceptions related to palliative care changed as a result of the elective. The use of patient case studies and site visit observations helped to reinforce material presented in the classroom. Implications: This elective course introduced students to an interprofessional team approach to the management of patients and exposing them to opportunities for pharmacists in the area of palliative care.

Development of a Medication Therapy Management (MTM) Curriculum for 2nd Year Pharmacy Students. Timothy R. Ulbrich, Northeast Ohio Medical University, Stacey R. Schneider, Northeast Ohio Medical University. Objectives: As Medication Therapy Management (MTM) services continue to evolve, it is essential to prepare pharmacy students to provide these services. The latest ACPE standards specifically address the need to prepare graduates who can practice MTM. Therefore, the purpose of this project is to describe the development and implementation of an MTM curriculum for 2nd year pharmacy students. Method: Medication Therapy Management (MTM) instruction is being incorporated as part of a required longitudinal course (Pharmacist Patient Care Experiences) during the spring of the 2nd professional year at NEOUCOM. Inclusion of MTM early in the curriculum was based on available time and the opportunity for students to practice their skills during their experiential rotations and/or internships. Students will attend seven, 1-hour didactic class sessions followed by a live practice case using community members as patients. The didactic sessions will cover topics such as key legislation, core elements, communication skills, billing, documenting, and tracking outcomes. Results: Detailed descriptions of the class sessions will be presented at the meeting, along with student feedback. Future plans include: (1) furthering the interprofessional education mission of our University by incorporating medical students and (2) including MTM principles as a theme throughout later therapeutic courses via practice cases and skills assessments. Implications: Pharmacist provision of MTM is critical to decrease healthcare costs and improve patient outcomes. By introducing the MTM process early in the curriculum, supplemented with regular practice, we hope pharmacy students will develop the expertise and confidence to apply MTM as independent practitioners.

Development of a Mentor Program for Undergraduate Pre-Pharmacy Students Led by Student Pharmacists and Faculty. Jacqueline B. Bumpass, Campbell University, Amanda R. Chason, Campbell University, Brenda Blackman, Campbell University, William M. Moore, Campbell University, Michael A. Gallagher, Campbell University. Objectives: To develop a mentor program for undergraduate pre-pharmacy students enrolled at Campbell University to enhance personal growth, professional development, career exploration and preparation for a challenging pharmacy education Method: Undergraduate students enrolled in the Pre-Pharmacy Seminar course in the Spring of 2011 will complete the APhA Career Assessment Questionnaire. Student pharmacists and faculty mentors have been selected and prepared to give support, counseling and guidance to the participants. A variety of modalities have been selected including one-one -one meetings, small group discussions, career pathway workshops and professional development seminars. All mentors and mentees will be asked to complete a follow assessment to gather information about their experiences which will be utilized for future planning purposes. Results: The program is in the implementation stage and will be completed in May 2011. The results will be provided in the body of the poster for the July Annual Meeting. Implications: The mentor program provides opportunities for the participants to enhance personal growth measures necessary to succeed in professional school and to provide support for these students in their journey towards a pharmacy education. The mentor program provides a mechanism to facilitate interaction, communication and development of mentees. The mentors will develop satisfaction by helping their mentees achieve their personal and professional goals and by having fun educate undergraduate.

Development of an Infectious Diseases Elective Course Focused on Antimicrobial Stewardship. Bonnie A. Falcone, University of Pittsburgh, Susan M. Meyer, University of Pittsburgh. Objectives: Develop an elective to introduce principles of antimicrobial stewardship and skills relevant to performing stewardship activities. Method: The alarming growth of antimicrobial resistance and its associated morbidity and mortality has focused attention on responsibilities and strategies for antimicrobial stewardship (AS) programs. Pharmacists with infectious diseases (ID) training have a defined and integral role in these pursuits. A new course was developed to introduce principles of AS and skills required for the pharmacists performing stewardship activities. The 1-credit course offered active learning and small group strategies to facilitate comprehension and application over a condensed 5-week period. A pre-course student assessment was used to determine baseline AS and ID knowledge as well as student expectations. A post-course assessment measured perceived learning and satisfaction. Results: Ten students successfully completed the new course. Active learning strategies included: cases, discussions, video-tutorials, microbiology lab tour, and a formulary project incorporating AS principles. The pre-course assessment completed by all 10 students revealed a majority were unfamiliar with AS, would benefit from review of fundamental ID and had expectations the course was designed to meet. Post-course assessment analysis is underway. Implications: Pharmacists with

advanced ID training have been identified as integral members of AS programs. An elective designed to introduce students to the principles and practice of AS using active learning strategies was accomplished in a 1-credit 5-week course. Pre-course assessment of students’ knowledge and expectations indicated students may not have prior exposure to AS and would benefit from review of fundamental ID concepts in the context of introducing AS principles.

**Development, Implementation and Evaluation of an Integrated Elective Course in Pain Management and Palliative Care.**
Justin Kuligren, Roseman University of Health Sciences, Rajan Radhakrishman, Roseman University of Health Sciences, Elizabeth J. Unni, Roseman University of Health Sciences, Elizabeth Sebranek, Roseman University of Health Sciences, Jin Zhang, Roseman University of Health Sciences, Tyler M. Rose, Roseman University of Health Sciences, Eric Hanson, Roseman University of Health Sciences, Renee E. Coffman, Roseman University of Health Sciences.

**Objectives:** Studies among practicing pharmacists have shown an inadequate level of knowledge in pain management. Despite this, several studies have emphasized the importance of integrating basic and clinical sciences for improving learning among health science students. Therefore, the objective of this project was to develop, implement and evaluate a novel, integrated elective course in Pain Management and Palliative Care. **Method:** Taking valuable input from two curricular summits (AACP Curricular Summit 2009, Pharmacy Pain Summit 2009) and based on organizational guidelines (e.g. IASP), a group of Roseman University of Health Sciences faculty with expertise in pain and palliative care developed a syllabus that integrated relevant pharmaceutical and clinical sciences. This 3-week course (60hrs) was offered for the first time in 2010 summer on both campuses of USN (Utah, Nevada). After completion of the course, an open ended questionnaire was sent to the enrolled students to assess their perception about this course. **Results:** All students who responded had a positive impression about the course. The use of integrated curriculum was well accepted by the students as it provided logical progression and better retention of concepts, and an opportunity to apply basic and clinical science knowledge in patient care. **Implications:** The preliminary outcomes of this study show that this novel course developed through the integration of pharmaceutical and clinical sciences enhances learning and improves retention of concepts in pain and palliative care among pharmacy students.

**Differences in Faculty and Student Grading: A Two Year Evaluation of SOAP Note Writing.** Kristi L. Rapp, Xavier University of Louisiana, Joseph M. LaRochelle, Xavier University of Louisiana, Shandrika R. Williams, Xavier University of Louisiana.

**Objectives:** Written communication and documentation is a critical and essential step in the patient care process. Documentation is a valuable tool for future encounters with patients and with other healthcare professionals. In a previous study that evaluated early introduction to written communication in the pharmacy curriculum, differences in scores between faculty and student graders were noted. This study aims to evaluate whether reinforcement and additional exposure to SOAP note writing will decrease the variability among SOAP notes graded by faculty and students. **Method:** One hundred and ten third year pharmacy students enrolled in a pharmacy practice laboratory completed two SOAP notes as a course requirement. After completing the assignment, each student graded an anonymous SOAP note utilizing a grading rubric. Then, a faculty member graded each SOAP note utilizing the same grading rubric. Additionally, each student completed a survey which assessed attitudes, knowledge, and confidence levels regarding SOAP note writing. At the end of the semester, students completed a post survey regarding SOAP notes and the peer evaluation process. During the previous academic school year, these students completed SOAP notes and graded their peers’ work. These scores will also be evaluated in this study. **Results:** One hundred and seven students participated in the study. All of the study participants completed the pre-survey instrument and eighty-five percent completed the post survey. Survey and evaluation results will be available in March. **Implications:** To be discussed.

**Diversity in Pharmacy: General Characteristics of the 2008-2009 PharmCAS Applicant Pool.** Nancy Nkansah, University of California, San Francisco, Vida Vongvanith, University of California, San Francisco, Serena Huntington, University of California, San Francisco, Renee Rosenberg, University of California, San Francisco, Olga Beyn, University of California, San Francisco, Mitra Assemi, University of California, San Francisco.

**Objectives:** According to the Institute of Medicine, eliminating health disparities will require training a diverse group of health care professionals. No data evaluating characteristics of applicants to pharmacy schools have been published to date. The objective of this study is to evaluate the characteristics of pharmacy school applicants with respect to educational background, ethnicity, gender, and parental educational attainment. **Method:** This study was reviewed and exempted by the University of California, San Francisco Institutional Review Board. The Pharmacy College Application Service (PharmCAS) dataset of 16,246 applicants to schools of pharmacy in 2009 was analyzed. A secondary data analysis was performed on the following variables: race/ethnicity, age, gender, grade point average (science, math, total), composite PCAT scores, parental education level, degrees (at time of application), number of pharmacy schools to which application was submitted, and ranking of pharmacy schools to which an application was submitted. Cross-sectional analyses were performed to assess for differences between applicants on the basis of educational background, ethnicity, gender, and parental education. **Results:** Data analysis is in progress and will be complete by the end of April. **Implications:** The results of this study will provide schools of pharmacy with a first-ever snapshot characterization of recent applicants to schools of pharmacy. This information will be valuable to pharmacy schools and the profession for national benchmarking for recruitment, educational, and/or diversity-related efforts.


**Objectives:** Few studies describe efforts for recruiting a diverse pharmacy student population. We performed a nationwide study to characterize current school of pharmacy (SOP) practices to recruit diverse students from the population. **Method:** This study was approved by the UCSF Committee on Human Subjects Research. A survey was developed based on evidence-based literature in Schools of Pharmacy, Medicine, and Nursing. Data collected included: school demographics, populations targeted for recruitment, recruitment activities/practices, collaborative efforts, financial support, and assessment metrics. The survey was piloted in California and refined prior to dissemination for a nationwide study. The Admissions Director or designee of each School of Pharmacy identified by the American Association of Colleges of Pharmacy was contacted and
consented for study participation. Once consented, the admissions representative was emailed a link to the online survey. Study participants were provided with reminders to complete the survey and an incentive was used to increase response rate. Results: Data analysis is in progress and will be completed by the end of April. The total response rate was 48% (58 out of 120 SOP). Responders represent 76% of states with SOP. The majority (67%) of responding institutions were public SOP. Implications: A diverse healthcare workforce has been shown to improve healthcare student learning, patient outcomes, and reduce health care disparities. Data from this nationwide study will provide schools with current recruitment practices that can be used for diversity program development and benchmarking.

Do HSRT Exam Results Predict How Well Students Will do in Pharmacy Therapeutic Courses? Kimberly K. Daugherty, Sullivan University, Meghan M. Bodenberg, Sullivan University, Hieu T. Tran, Sullivan University. Objectives: The California Health Science Reasoning Test (HSRT) is commonly used by Health Science programs to test critical thinking in our students. This poster will compare student HSRT results to their overall course averages in our therapeutic sequence (4 classes with increasing level of complexity + lab work) to determine if student’s results on the HSRT exam correlate with how well they did in the sequence. A secondary objective is to compare the student’s HSRT results to each individual class in the sequence. Method: Students currently take the HSRT exam during the first month of their first year at our College of Pharmacy. The therapeutic sequence starts in the Fall quarter of the 2nd professional year of our three year program. Students’ individual HSRT results will be compared to their overall average in the whole therapeutic sequence as well as each course individually to see if there is a correlation. Results: One hundred and sixty one students will have completed the therapeutic sequence by the time of poster presentation. Data collection is complete and analyze is ongoing. Implications: Pharmacy therapeutic sequences require enhanced critically thinking skills. The results of this poster will help to determine if the HSRT exam taken prior to the start of a student’s therapeutic sequence can help determine a student’s success in the therapeutic sequence of a program. This information could help to target students early on that need help developing the necessary critical thinking skills to succeed in a therapeutic sequence.

Early Interprofessional Education Using SecondLife. Teresa M. Seefeldt, South Dakota State University, Jane R. Mort, South Dakota State University. Objectives: Interprofessional education is a key component in the education of health professionals. However, several challenges to the implementation of interprofessional education have been identified including time, space, and geographic location. Use of technology could help to overcome some of these obstacles. The objective of this project is to evaluate the use of SecondLife, a multi-user virtual reality program, in developing an appreciation for interprofessional activities. Method: A case was developed and reviewed by faculty in each represented profession. Profession specific information was developed to encourage discussion. The case conferences will be conducted using the university’s island within SecondLife in spring 2011 and will involve pharmacy, nursing, physician assistant, physical therapy, occupational therapy, and social work students. A faculty member will act as facilitator for the discussion. Another faculty member will observe and provide comments about the quality of the discussion. Students will be surveyed before and after the activity to determine their impressions of interprofessional involvement and opinions regarding use of virtual worlds in interprofessional education. Results: Pre- and post-interprofessional meeting survey data (Likert scale) examining perception of interprofessional activities will be compared. Survey data of students’ perception of the utility and usability of a virtual world in interprofessional education will be described. Implications: SecondLife may provide a platform to overcome logistical issues associated with interprofessional education and allow an interdisciplinary team experience early in the students’ education.

Effect of a Recruitment Ambassadors Program on Recruitment and Admissions. Carla Y. White-Harris, University of North Carolina at Chapel Hill, Wendy C. Cox, University of North Carolina at Chapel Hill, Jennifer Corinna, The University of North Carolina at Chapel Hill. Objectives: To explore the effect of a highly structured recruitment ambassadors program on recruitment and admissions. Method: The recruitment ambassadors program at the UNC Eshelman School of Pharmacy was developed in 2008. Each year, the group consists of over one hundred members comprised of students, faculty, and alumni. Ambassadors are recruited and trained through the Office of Recruitment and Diversity Initiatives. Recruitment ambassadors are assigned to specific colleges, high schools, and programs for recruitment, and are required to facilitate and engage in a minimum of three events annually. Events include open houses, information sessions, career panels, seminars, health and science fairs, and invited presentations. Results: From 2008 through 2010, 423 recruitment events were held. This resulted in over 1000 prospective student contacts, ranging from middle school to current college students. Out of these students, 181 applied and were admitted to the School’s PharmD program. Implications: Exposure to various careers in the pharmacy profession remains a critical need. A highly structured and proactive program involving students, faculty, and alumni can maximize outreach potential and have a significant effect on admissions and the pharmacy profession. Implementation of a team recruitment strategy optimizes community engagement and significantly increases the ability to expand outreach to prospective students. The need for colleges to explore alternative methods for increasing enrollment provides new opportunities and challenges in the quest to attract students. These challenges and opportunities can be addressed with the development of a recruitment ambassadors program including a targeted recruitment strategy, coupled with training for potential recruitment ambassadors.

Effectiveness of a Peer-to-peer Tutoring Program in Assisting Students in Academic Difficulty. Angela O. Shogbon, Mercer University, Kathryn M. Momary, Mercer University. Objectives: To evaluate if participation of students in academic difficulty in a peer-to-peer tutoring program is associated with an increase in exam scores and course passing rate compared with similar students who do not utilize the program. Method: Students in academic difficulty are identified as those who have received a failing score of less than 70% on an exam. At our institution, these students are eligible for limited fee-waived peer-to-peer tutoring as part of an effort to meet the Accreditation Council for Pharmacy Education standards on the Progression of Students. These peer-to-peer tutoring services are provided by second through fourth professional year pharmacy student members of the Rho Chi Academic Honor Society. Tutees’ performance on subsequent exams after each tutoring session is tracked to assess progress in the program. An average grade on all exams and final course grade for students in academic difficulty will be collected and compared between those who received tutoring and those who did not. Data will be analyzed using descriptive statistics and student’s t-test. Results: One year of data (from fall 2010 and spring 2011) will be collected and analyzed. A comparison of performance of students in academic difficulty who received tutoring
Effectiveness of the QuEST Process in a Mocked Disease State Management Scenario. Shelley M. Jones, University of Kentucky, Stacy Taylor, University of Kentucky, Mikael D. Jones, University of Kentucky, Douglas T. Steinke, University of Kentucky. Objectives: The QuEST process provides a framework for interviewing and counseling patients regarding self-care issues. No studies have evaluated its usefulness beyond the self-care setting. This project investigates whether the QuEST process is an effective tool for interviewing and counseling patients in a mocked outpatient clinical pharmacy disease state management scenario. Method: Third-professional year (PY3) pharmacy students in the Patient Care Lab (PCL) course participate in mock patient encounters (PEs) to demonstrate knowledge and skills learned throughout the curriculum. Training in communication skills and the QuEST process occurred prior to PY3 year. For this PE, students demonstrated their ability to manage a recently discharged heart failure patient in an ambulatory clinical pharmacy setting. Students were evaluated on ability to gather thorough patient information, identify drug therapy problems, and communicate an appropriate therapeutic plan. Students were evaluated by the standardized patient. Students reviewed their recorded encounter and completed a self-assessment using the QuEST rubric. Student opinions were collected regarding usefulness of the QuEST process for a non-self-care issue. Evaluator and student self-assessment will determine students’ compliance with the QuEST process. A categorical analysis will determine if utilization of the QuEST process correlates with a higher score. Results: Data is undergoing analysis. Implications: If the QuEST process is useful beyond self-care settings, this method of interviewing and counseling patients can be taught and emphasized longitudinally throughout the curriculum. Research is needed to further validate its utility in other pharmacy settings.

End of the Year Capstone Exam Descriptions. Kimberly K. Daugherty, Sullivan University, Meghan M. Bodenberg, Sullivan University, Maria Lourdes Ceballos-Coronel, Sullivan University, Hieu T. Tran, Sullivan University. Objectives: As part of the College of Pharmacy Program Assessment Plan students are required to take Capstone exams at the end of their first and second professional years. This poster will describe the capstone exams that were conducted for the PY1 and PY2 classes. Method: The exams included a didactic and skills assessment. The exams were created in-house except for the didactic assessment for the PY2s which is the Pre-NAPLEX exam from NABP. Both exams for the PY1s and the didactic assessment for the PY2s were low stake. The skills assessment for the PY2s was high stake. Results: The average score on the PY1 didactic assessment was 63.8% ± 8.42. All students passed the sterile product portion of the PY1 skills assessment. Thirty percent of students failed part of the compounding and drug information skills portion of the PY1 skills assessment. The average score on the PY2 didactic assessment was 67.6% ± 18.85. Twenty-seven percent of students failed a portion of the PY2 skills assessment the first time. Implications: As a College we felt that the low stakes nature of the exams led to the students’ poor performance on the exams. As such, this years exams have been changed and we are awaiting results. We feel that capstone exams can be a useful tool to help can gauge student retention of information.

Evaluation of Perceived Effectiveness of Customized Pharmacy Compounding Skills Videos. Tera McIntosh, University of Kentucky, Chase Higginson, University of Kentucky, Alysa D. Beard, University of Kentucky, Stacy Taylor, University of Kentucky. Objectives: Although several compounding textbooks contain instructional videos, differences in equipment, techniques, and compounded products have led to underuse of commercially-available videos. Faculty in the professional practice laboratory courses at the University of Kentucky College of Pharmacy developed web-based multimedia videos to demonstrate both sterile and non-sterile compounding techniques that were specific to upcoming compounding lab activities. The purpose of this project was to assess student use and perception of instructional sterile and non-sterile compounding videos. Method: Students in second professional year (PY2) lab courses, PPS 939 (Fall) and PPS 949 (Spring) were given an assignment to view the videos prior to performing the skills the first time in the fall semester and prior to subsequent performances in the spring semester. The videos were available through the course website and a common College of Pharmacy Documents Library on the intranet. Students were asked to complete a survey to determine the perceived impact the customized videos had on their preparation for lab. Course evaluations will be reviewed to assess perceived impact of customized videos on student learning. Results: Data from the surveys and course evaluations will be analyzed and presented. Implications: Faculty at our College of Pharmacy previously relied on in-class demonstrations and textbook or internet based video clips from other organizations for use as teaching aids in skill demonstration. Customized videos, directly applicable to the equipment, techniques and products used in lab activities, may be a better approach to ensure student learning.

Evaluation of Standardized Patients and Physician Instruction in a Physical Assessment Course for Pharmacy Students. Emily K. Flores, East Tennessee State University, Kari M. Kuykendall, East Tennessee State University, Sara R. Weidert, East Tennessee State University. Objectives: To determine pharmacy students’ impressions, acceptance, perceived utility, and educational value of a course in physical assessment utilizing standardized patients and taught by a medical school faculty. To assess how pharmacy students perform and participate in this setting, from the perspective of the standardized patients and the physician instructor. Method: The students were asked to evaluate the course at the end of the semester through an online survey. It included specific questions regarding their perceived future usefulness of the course, their perceptions about instruction by a physician, and the use of standardized patients. The physician instructor and the standardized patients were also surveyed to obtain their perspectives on how the pharmacy students performed and participated in the course compared to medical students. The responses to the survey were anonymous with the exception of the physician instructor. Results: Responses from the surveys will be compiled and undergo statistical analysis. The results will be available for presentation in Spring 2011. Implications: As the clinical role of a pharmacist expands, the development of physical assessment skills and knowledge is essential for patient care. To enhance students’ development of physical assessment skills, new methods must be used in didactic curricula. Utilizing standardized patients and physician instructors may be ways to push the clinical role of pharmacists forward in this area.

Evaluation of a Journal Interpretation Summary Tool (JIST) to Facilitate Journal Club. Suzanne M. Galal, University of the Pacific, Steven Barolotti, MetroWest Medical Center, Paul M. Szumita, Brigham and Women’s Hospital. Objectives: The purpose of this paper is to introduce and describe a standardized tool, Journal Interpretation Summary Tool (JIST) and describe the implementation into the curriculum. Method: The JIST is a template that organizes the major elements of a study, allowing the facilitator and participants to efficiently navigate through the key information and guide the journal club discussion. The JIST consists of seven sections. The first five divide the study into the following categories: background, general overview, methods, results, and authors conclusions. The last two sections of the JIST, the PIES Method of Critique and leader’s conclusion, facilitate discussion of the participants’ analysis of the study. Journal club discussions are integrated into the Practicum 3 course during the 5th semester of an accelerated 3 year program. Students are divided into sections and have an assigned facilitator for the group that is either a PGY1 resident or faculty. Results: To date one journal club has been conducted and another is scheduled for the end of the semester. Student and facilitator feedback will be collected and assessed as to what the attitudes and perceptions are of the use of JIST and overall satisfaction of how the journal club discussion was run. Implications: The JIST presents a standardized template that may be used to facilitate the journal club process. The use of the JIST template will better enable students and practitioners alike to enhance their critical evaluation skills used in critiquing medical literature with the goal of applying study results to patient care.

Evaluation of a Peer-to-peer Tutoring Program in a Pharmacy Curriculum. Angela O. Shogbon, Mercer University, Kathryn M. Momary, Mercer University. Objectives: To describe the impact of a peer-to-peer tutoring program on the academic performance of tutees and their perception of the program. Method: The Rho Chi Academic Honor Society at our institution provides peer-to-peer tutoring to requesting students. Students are eligible for limited fee-waived tutoring if they obtain a failing score (less than 70%) on an exam, or they may pay for tutoring out of pocket. Tutors are second through fourth year pharmacy student members of Rho Chi. Tutees’ performance on exams after each tutoring session is tracked to assess progress in the program. Completion of an online evaluation by tutors and tutees after each session is required to document perceptions of the session. Results: Preliminary data analysis (from fall 2010) was performed on 35 tutees, tutored in 5 different first through third professional year courses by 28 tutors. A passing score (70% or greater) was achieved in 63% of exams (n=57) for which students were tutored. The mean(SD) change in exam score after each tutoring session was 10.5(10.0) points (out of 100 points). A total of 73% of tutees achieved a passing grade at the end of the course. The online evaluation was completed by 66% of tutees and most reported an improvement in study strategies (91%) and ability to succeed in the course (87%). Data from spring 2011 will be reported as well. Implications: A peer-to-peer tutoring program may improve the academic performance and study strategies of students and serve as a useful tool to incorporate in other schools of Pharmacy.

Evaluation of a Required Teaching Rotation for Pharmacy Residents at a School of Pharmacy. Jennifer E. Bryant, University of Wisconsin-Madison, Karen Kopacek, University of Wisconsin-Madison, Beth A. Martin, University of Wisconsin-Madison, Susanne G. Barnett, University of Wisconsin-Madison, Andrea L. Porter, University of Wisconsin-Madison, Casey Gallimore, University of Wisconsin-Madison. Objectives: The purpose of this study is to evaluate the formal teaching rotation experience for pharmacy residents at the University of Wisconsin (UW) School of Pharmacy, with a special focus on resident opinions regarding the quantity and quality of teaching experiences available and preceptor involvement. Method: This study is a quasi-experimental design using a pre- and two post-administration surveys. The initial survey and the first post-survey have been distributed to pharmacy practice residents who have a teaching rotation with the UW School of Pharmacy; the final survey will be administered at the completion of the Spring 2011 academic semester. The resident teaching rotation at the UW School of Pharmacy provides experiences in the instruction of pharmacy students in a Pharmacotherapy course. Survey questions focus on the attitudes residents hold regarding teaching at the beginning, mid-point, and end of their experiences, the types of teaching opportunities available, and the quality of support from preceptors. Participants were also asked to submit responses to reflective questions regarding their teaching experiences to assist with a qualitative review. The results of this study will be used to identify factors important to resident attitudes on the teaching experience and to identify areas for improvement in the teaching rotation. Results: Pending. Implications: The results of this study will be helpful in guiding the improvement of the resident teaching rotation at the UW School of Pharmacy and will provide data to guide the development and improvement of similar teaching rotations for pharmacy residents at other sites.

Evaluation of an Electronic Prescription Verification Program. J. Tyler Stevens, Virginia Commonwealth University, Laura A. Morgan, Virginia Commonwealth University. Objectives: To evaluate how pharmacy students use an innovative testing program to assess: (1) student performance on computer-based testing compared to paper-based testing; (2) if there is a difference in types of errors and omissions identified by students; and (3) pharmacy student satisfaction. Method: Students participating in the project include second-year pharmacy students. Students completed both a paper-based test and computer-based test on the same day. Each of four course sections was randomized to the order the tests administered. Students completed six prescription verification tests (three computer-based and
three paper-based) over the course of the semester. Three different types of prescriptions were used in the tests. Types of prescriptions included non-controlled, controlled, and weight-based. Both students and faculty completed surveys related to their perceptions of the prescription verification testing methods. Results: A total of 128 second year pharmacy students were tested using both electronic and written formats. Preliminary results show a difference in grades between the two methods. The electronic average was 88.2% compared to the written average of 79.2%. The majority of students who responded to the initial survey reported satisfaction with the use of both electronic (73%) and written (89%) methods. Survey results do not indicate a preference for testing method. Implications: This study aims to add to the body of knowledge on the comparison of computer-based testing to paper-based testing and pharmacy students’ prescription verification performance.

Evaluation of Students’ Perceptions about Contract Grading in a Pharmacotherapy Laboratory Course. Andrea L. Porter, University of Wisconsin-Madison, Karen Kopacek, University of Wisconsin-Madison. Objectives: To evaluate students’ perceptions about contract grading and to determine whether students prefer contract grading over more traditional grading methods. Method: Contract grading has been used in the laboratory portion of a Pharmacotherapy course for second-year students for the past two years. Students enrolled in this course during fall 2010 and spring 2011 will be surveyed at three points during the academic year. The first survey was administered at the beginning of the fall semester and gathered demographic information and data on students’ previous use with contract grading. The second and third surveys use a 5-point Likert scale (1 = strongly disagree, 5 = strongly agree) to gather information about perceptions of contract grading. The second survey was administered at the beginning of the spring semester. The third survey will be administered at the end of the spring semester. Results: The demographics survey was completed by 108 students (79.4%). Eight students had previously experienced contract grading and of those students, 66.7% preferred contract grading over other grading methods. The second survey was completed by 91 students (68.4%). Students felt that contract grading had clear expectations for each grade level (4.05 ± 0.86) and made it easier to control their final grade (3.98 ± 0.83). The majority of students preferred contract grading over more traditional methods (80.9%). Complete results will be presented. Implications: The data generated by these surveys will be used to enhance contract grading in the second-year Pharmacotherapy laboratory courses. Preliminary results show that students prefer the use of contract grading over more traditional methods in this course.

Exam Remediation in Didactic Clinical Pharmacy Courses. Dean S. Collier, University of Nebraska Medical Center, Donald G. Klepser, University of Nebraska Medical Center. Objectives: We conducted a retrospective, observational study to evaluate the effects of an exam remediation policy on second and third year pharmacy students enrolled in a three-semester, 27 credit-hour sequence of Pharmacotherapy courses. The three courses are sectioned by organ systems. Method: Faculty members were concerned that a student may advance (cumulative exam average >70%) despite failing exams for one or more sections (section exam score <70%). To address these concerns, a formative exam remediation policy was developed and implemented. Students failing any section exam were required to undergo remediation (retake of the failed exam or oral exam with faculty panel or written essay). Results: Included in this observation were 452 students enrolled in the Pharmacotherapy sequence 2005-2010; 258 prior to exam remediation (2005- Spring 2008) and 194 with the remediation policy in place (Fall 2008 - 2010). Out of 2304 student exams since the implementation of the remediation policy, there were 84 (3.65%) exam failures requiring remediation. All of whom successfully completed remediation requirements. The failure rate after implementation of a remediation policy was lower than the failure rate prior to its implementation (192/3728, 5.15%) (p = 0.006). Implications: All students failing a section exam since the remediation policy was implemented have demonstrated competence over the section material. An unexpected decline in the number of section exam failures observed after the remediation policy was implemented needs to be more fully examined. Students and faculty have accepted this process as an improvement to the courses.

Examining the Development of Social and Emotional Competence through Student-Patient Consultation Performance. Suzanne M. Galal, University of the Pacific, Craig R. Seal, University of the Pacific, Christopher M. Lopez, University of the Pacific, Sian Carr-Lopez, University of the Pacific. Objectives: To assess the impact and development of social emotional competencies (SEC) through mock student-patient consultation performance. Method: First-year pharmacy students enrolled in the Practicum course were evaluated in simulated patient consultation sessions. The evaluations were conducted by second-year Teaching Assistants (TAs) who used a 4-point scale as well as free-text comments to assess performance. The TAs completed a 2 hour training session, including a lecture on social emotional competence (SEC) and practice grading sessions with the use of the grading rubric. The grading rubric assessed students’ consideration, connection, influence, and contained a self evaluation portion examining awareness. Students completed three consultation sessions on smoking cessation, prescription and non-prescription products at three different points in the semester. The researchers also had access to scores on the Social Emotional Development Inventory (SED-I), that provides information on self perception of frequency of emotional behaviors, traits and indicators that impact success in social interactions. Results: The TA evaluations, simulation scores, course grades, and SED-I assessment will be evaluated for themes between SEC and student performance. Also, SEC and consultation performance development will be assessed by examining changes in scores throughout the semester. Implications: The literature has demonstrated the potential importance of SEC and practicum course experience to enhance student success in relating and responding to patient needs. Future studies are needed to evaluate the depth and breadth of the issue, and if confirmed, Pharmacy education will need to incorporate more opportunities for students to practice and develop essential SEC for successful professional practice.

Facilitating Active Learning from a Distance Using an Audience Response System. Yuen Ting (Cathy) Lau, Texas A&M Health Science Center. Objectives: Clinical faculty members dispersed throughout Texas regularly present didactic lectures to pharmacy students in Kingsville utilizing videoconferencing. Despite the effort to interact with the students, distance faculty received disappointing feedback on student engagement during the lectures. Consequently, a faculty member used TurningPoint™ and RemotePoll™, an audience response system for distance polling, to engage second-year students in active learning from afar. Method: Designed to address the lower- to higher-order thinking skills of Bloom’s taxonomy, each two-hour lecture included six to thirteen audience response questions that gradually progressed from recalling important facts to solving
therapeutic problems in patient cases. TurningPoint™ was used to create the questions, and RemotePoll™ provided immediate polling results from a distance. The results led to further discussion of the lecture content. **Results:** In the course evaluation, the students indicated that the TurningPoint™ questions allowed them to actively participate during the lectures, connect the lecture content with clinical practice, and form a deeper understanding of the material. However, some students stated that the technical difficulties experienced early on with the distance polling were disruptive. **Implications:** The audience response questions allowed the faculty member to involve all students in active learning from a distance. The students received instant feedback from the polling results, and the faculty member was able to address the deficiency in knowledge immediately during the lectures. Since the polling devices limited the questions to multiple-choice type, questions needed to be written carefully to stimulate students to exercise the higher-order thinking skills.

**Faculty Perceptions of the First Year of an E-Portfolio Program in a College of Pharmacy.** Kathy E. Komperda, Midwestern University’s Chicago College of Pharmacy, Jennifer Phillips, Midwestern University’s Chicago College of Pharmacy, Robin M. Zavod, Midwestern University’s Chicago College of Pharmacy, Ana C. Quinones-Boex, Midwestern University’s Chicago College of Pharmacy, Huzefa Master, Midwestern University’s Chicago College of Pharmacy, Susan R. Winkler, Midwestern University’s Chicago College of Pharmacy, Avery L. Spunt, Midwestern University’s Chicago College of Pharmacy. **Objectives:** In Fall 2010, a new reflective e-portfolio program utilizing TaskStream™ was implemented into our first professional year curriculum. These portfolios are intended to promote student reflection, document the students’ longitudinal progression in the achievement of the college’s curricular outcomes and to provide a mechanism to learn the value of continuous professional development. Faculty members serve as advisors for a group of ten students and are responsible for evaluating their advisees’ portfolios during the first three academic years. Students submit two sets of entries during their first year; baseline assessment entries (Fall quarter) and progressive achievement submissions (Winter quarter). The objective of this study is to evaluate faculty advisors’ perceptions of the portfolio program thus far and the process associated with portfolio entry evaluation. **Method:** Two electronic questionnaires were developed to capture faculty advisors’ perceptions of the process and were administered utilizing SurveyMonkey™. The first questionnaire was distributed to the faculty advisors (N~22) shortly after the baseline entries were evaluated. A reminder email was sent two weeks later. The second questionnaire will be sent to the faculty shortly after the progressive achievement submissions have been evaluated. The data collection period for each questionnaire was set at three weeks. **Results:** Data collection is in progress. The first questionnaire was completed in Winter 2011 and the second questionnaire will be distributed in Spring 2011. **Implications:** Evaluation of faculty advisors’ perceptions will assist with future modifications to the portfolio evaluation process to ensure program success.

**Fairytale Creative Writing to Improve Comprehension of Immunological Mechanisms.** Ian C. Doyle, Pacific University Oregon, Brad S. Fujisaki, Pacific University Oregon, Jennifer M. Jordan, Pacific University Oregon. **Objectives:** The purpose for this creative writing assignment was to increase familiarity and comprehension of complex immunologic mechanisms and medications, within and between pharmacy student teams. **Method:** Pacific University School of Pharmacy utilizes a modified block curriculum, combining didactic lecture and student team active learning techniques. Following 7 hours of immunology lecture, students assembled into their 14 pre-assigned teams of 6 to 7 students to create a fairytale that personified 1 of 5 immune cascade processes. Students additionally incorporated an assigned medication, explaining its impact on the cascade. Groups were provided 45 minutes to create their fairytale, which had the potential to be presented before the class. Students could create and present the fairytale in any medium, with deliverable content not to exceed 10 minutes. **Results:** Five groups presented their fairytale in order of immunologic cascade. Presentation medium included “silent film” with narrator, drawings via overhead projection with narration, and simple story-reading. Groups demonstrated self-initiative, sharing their respective fairytales via the electronic course management system (Blackboard CE 6). A post-activity survey of student perception was administered, with aggregate results pending. **Implications:** Literature searches in the Medline, IPA, and ERIC databases did not yield reports of creative writing as an exercise to increase comprehension of topics related to pharmacy curricula. These results may suggest alternative learning activities that foster improved learner comprehension of complex molecular processes. Future research should evaluate whether alternative learning activities such as fairytale creative writing improves long-term retention of this type of content material.

**Gaining Consistency in a Case-Based Learning Approach: Faculty and Student Perceptions.** Julie A. Testman, University of Charleston, Marcella Hoyland, University of Charleston, Angel Beck Kimble, University of Charleston. **Objectives:** To evaluate faculty and student perceptions of efforts made to address commonly identified concerns regarding inconsistencies in case coordination, delivery, and evaluation throughout a team taught pharmacotherapy course sequence. **Method:** The pharmacotherapy course sequence consists of three consecutive eight credit hour courses. As multiple professors are involved in the delivery and assessment of individual cases, concerns were identified by all parties regarding inconsistencies in case coordination, delivery, and evaluation among various professors. Prior to the second pharmacotherapy course, revisions were implemented in the course process, including: the appointment of a specific case coordinator to oversee the course, development of a comprehensive case guide for both faculty and students, implementation of a case orientation for students at the beginning of each semester in the series, and the development of a detailed case rubric to address perceived grading inconsistencies among faculty. Only faculty and students involved in courses both before and after the modifications were implemented were surveyed. Six faculty and 69 students met the criteria for inclusion and were asked to complete a 13 item questionnaire utilizing a five-point Likert scale. **Results:** Five faculty members and 69 students completed the survey. Overall perceptions of revisions were more favorable among faculty. Continued student concerns were identified through the survey data despite the significant number of case revisions implemented. **Implications:** The initial survey results led to re-evaluation and further modifications to case coordination, delivery, and evaluation including a more detailed case orientation, provision of an example case, and further standardization of the case rubric.

**How Did I Miss That? A Laboratory Exercise Demonstrating Insufficient Attention.** Roxie L. Stewart, The University of Louisiana at Monroe, Candace T. Chelette, The University of Louisiana at Monroe, Scott A. Baggarly, The University of Louisiana at Monroe, Joseph B. Feldhaus, The University of Louisiana at Monroe. **Objectives:** To increase awareness of inattentive behavior and its possible role in pharmacy errors, to measure the influence of insufficient
attention and lack of knowledge upon pharmacy errors, and to assess the confidence level of pharmacy students in their application of practice-related legal principles before and after a simulated laboratory exercise. **Method:** Students were randomly assigned to the role of pharmacist or a support role of technician, intern, or patient in a mock pharmacy setting. A simulation was repeated in which three different pharmacists oversaw typical busy pharmacy operations (filled prescriptions, answered phone calls, monitored patient counseling activities, and supervised personnel). For each repetition, supporting roles remained constant while pharmacists changed. During the simulation, student pharmacists were presented with situations that challenged state law/regulations. Laboratory instructors documented the number and type of prescription errors and whether or not the student pharmacist recognized and reported the violation. Students completed an assessment prior to and after the exercise on their confidence in their knowledge of selected legal requirements and in their ability to recognize when these laws are violated. Classroom discussion about insufficient attention and its potential role in pharmacy errors occurred prior to the post assessment survey and students were asked to provide comments about the exercise. **Results:** Work in progress. **Implications:** Demanding and distracting work conditions may contribute to a lack of concentration possibly resulting in errors. An increased awareness of inattentive behavior may help students realize that focused attention is needed in every aspect of pharmacy practice.

**Immunization Education and Training Offered as a Component of the Pharmacy Curriculum.** Janene M. Madras, Lake Erie College of Osteopathic Medicine School of Pharmacy, Kimberly Burns, Lake Erie College of Osteopathic Medicine School of Pharmacy, Mary E. Ray, Lake Erie College of Osteopathic Medicine School of Pharmacy, Anna L. Lindahl, Lake Erie College of Osteopathic Medicine School of Pharmacy, Emmalee Maher, Lake Erie College of Osteopathic Medicine School of Pharmacy. **Objectives:** It is vital to the pharmacy profession that pharmacy students receive immunization education and training. In 2009, an estimated 38% of pharmacy colleges/schools offered immunization education and training to their students as a component of the curriculum. With the expanded role of pharmacists as immunizers across all 50 states, it is important to determine if pharmacy colleges/schools are preparing future pharmacists for this vital public health responsibility. The objective of this study is to inform the academic pharmacy community regarding the number of colleges/schools of pharmacy offering immunization education and training and details about how they are incorporated into the curriculum. **Method:** A 17 question survey was developed in 2009 to 2010 for both classes. **Results:** Total mean OSCE scores slightly decreased from 2009 to 2010 for both classes. PY2 mean scores in 2009 were 86.5% (n = 146) vs. 81.9% in 2010 (n = 153). PY3 mean scores in 2009 were 85.2% (n = 144) vs. 83.2% in 2010 (n = 144). On the post-OSCE survey, the majority of students disagreed that the role plays helped prepare them for OSCEs. **Implications:** The new in-class role plays in PCL did not improve OSCE scores after one semester of implementation.

**Impact of Student-Led PCAT Reviews on Admissions.** Carla Y. White-Harris, University of North Carolina at Chapel Hill, Stefanie P. Ferreri, University of North Carolina at Chapel Hill. **Objectives:** To evaluate if student-led PCAT reviews impact admissions to pharmacy school. **Method:** Low PCAT scores are a common challenge for students applying for admission into pharmacy schools. There are limited resources available to prepare students for this exam. Members of the Student National Pharmaceutical Association (SNPhA) were aware of this issue and developed a two day PCAT review to help prospective students. The program also served as a fundraiser for the organization. The review course has been conducted annually from 2004 to 2010. SNPhA members coordinate the entire review and are responsible for the following: identifying instructors; marketing; creating a budget; handling registration fees; discussing test taking skills; and administering a mock PCAT exam. SNPhA faculty advisors have a minimal level of engagement with student-facilitated planning sessions, but are available as resources to the student members. Evaluations were completed by program participants each year and compiled to determine the effect of the reviews on admissions. **Results:** There were 430 participants who attended the PCAT review. Ninety-nine were offered and accepted admission. SNPhA students used the funds to invest in other service projects, develop a scholarship, and cover start-up costs for the following year. The program provided SNPhA students opportunities for professional development, leadership, accountability, and ownership of the program. **Implications:** Implementation of a student-led sustained PCAT review fulfills an unmet need for prospective pharmacy students. The program also provided a venue for SNPhA members to display initiative and professionalism and aid in recruitment for the UNC Eshelman School of Pharmacy.

**Impact of a Pharmacist Managed HIV/HCV Co-Infection Clinic.** Jerika T. Lam, Loma Linda University. **Objectives:** 1. To improve adherence rates to the hepatitis C treatment among HIV/HCV co-infected patients. 2. To increase the rates of sustained virologic response (SVR) among HIV/HCV co-infected patients and reduce potential healthcare costs. **Method:** This pilot study was approved.
by the Loma Linda University IRB. The study was conducted at the Desert AIDS Project (DAP) Health Center from January 2008-May 2010. Patients who were HIV-positive and co-infected with hepatitis C virus (HCV) were referred to the pharmacist for hepatitis C medication initiation, compliance and pharmacotherapy management. The pharmacist initiated therapy under protocol and monitored for drug interactions between hepatitis C medications and concomitant medications. Inclusion criteria consisted of those aged between 18 and 70 years, receiving medical care at DAP, stable with their HIV disease, co-infected with HIV and HCV, have a stable renal function, have not abused substance or illicit drugs in the past 6 months, and have not responded to previous interferon or pegylated interferon and ribavirin. The data evaluated the impact from the interventions and recommendations provided by the pharmacist. Patient demographics, HIV and HCV RNA viral loads, CD4+ count, complete blood counts, liver function tests, and renal function were reviewed at baseline, during, and after completion of hepatitis C treatment. Results: N = 22 Caucasian (81%), Hispanic (19%) Average age: 48 yo 84% of HIV/HCV co-infected participants with genotype 1 achieved SVR Implications: Our study showed the positive impact of a pharmacist on improving successful completion of hepatitis C treatment and increasing SVR rates for HIV/HCV co-infected patients at DAP.

Impact of Awareness and Education of Free NLM Databases in Community Pharmacy Preceptors. Joanne R. Jansen, Sullivan University, Miriam A. Ansong, Sullivan University, Tuong Mai, Sullivan University, Varun Dalwadi, Sullivan University. Objectives: To evaluate the impact of increasing awareness of NLM databases on community pharmacy preceptors through training and education Method: Community pharmacy preceptors have a duty to provide exemplary instruction to student pharmacists. Available drug and health information must be identified and consulted to accomplish this task. The National Library of Medicine (NLM) provides free, comprehensive databases on many topics including drug information, household hazards, toxicology, chemistry, and genetic information. These databases may not be covered in the didactic portion of the curriculum but can serve to reinforce student pharmacists’ learning and provide additional resources for their future practice. Community pharmacists may be unaware of these resources, and education can enhance their knowledge, and in turn student pharmacists’ knowledge. Thorough research was conducted from inception to December 2010 via PubMed, IPA and reputable internet sites with limited results. Education about these resources will allow community pharmacists to better reinforce student pharmacists’ learning. Community pharmacists will be surveyed about their perceptions and awareness of the databases. Training modules will be developed and delivered to the pharmacists. Assessment of impact on their knowledge will be conducted after the training. Details of this assessment will be discussed at the conference. Results: Data collection and analysis are in progress and will be presented at the AACP Annual Meeting. Implications: This study will increase community pharmacy preceptors’ awareness of NLM databases in order to benefit student pharmacists in their practice. The investigators plan to use this data to encourage community pharmacy preceptors to access these databases.

Impact of Student-Directed versus Instructor-Directed Case Discussions on Student Performance in a Pharmacotherapy Capstone Course. Jennifer M. Trujillo, University of Colorado, Joseph J. Saseen, University of Colorado, Sunny A. Linnebur, University of Colorado, Brian A. Hemstreet, University of Colorado, Laura M. Borgelt, University of Colorado, Doug Fish, University of Colorado. Objectives: To evaluate the impact of incorporating student-directed learning activities into a pharmacotherapy capstone course on student performance. Method: This 9-credit, case-based course was redesigned so that one-half of case discussions are instructor-directed and one-half are student-directed. Instructor-directed sessions are one-day “short-cases” held in lecture classrooms, led by content expert instructors, with groups of 35 students. Student-directed sessions are multiple-day “long-cases” held in smaller rooms, with groups of 14 students. Results: One-hundred thirty-nine students completed the course in spring 2010. Students were evaluated using verbal and written exams. Three written exams consisted of 117 questions (64 from short cases and 53 from long cases). Students performed better on short case questions compared to long case questions. The mean percentage of students answering short-case questions correctly was 84% versus 73% for long case questions (p<0.0001). This difference was consistent among both application questions (80% versus 73%, p<0.0001) and knowledge questions (87% versus 76%, p<0.0001). Three verbal exams consisted of 90 possible questions (42 from short cases and 48 from long cases). Students performed better on long case questions compared to short case questions. The mean percentage of students answering short-case questions correctly was 74% compared to 78% for long-case questions (p=0.0005). Students performed better on long-case application questions compared to long-case knowledge questions (87% versus 76%, p<0.001). Implications: Students performed better on written exam material learned in an instructor-directed environment, but performed better on verbal exam material learned in a student-directed environment. Possible reasons for these results will be explored.

Impact of Teaching and Assessment Strategies on Development of Motivational Interviewing Skills in Pharmacy Students. Ana M. Lupu, Duquesne University, Autumn L. Stewart, Duquesne University, Christine K. O’Neil, Duquesne University. Objectives: To evaluate the impact of various methods of teaching and assessing motivational interviewing (MI) on pharmacy students’ ability to use MI skills, knowledge of behavioral change counseling principles, and self-assessed confidence and attitudes towards applying these methods in practice. Method: This study utilizes a quasi-experimental design among a convenience sample of first year pharmacy students enrolled in a pharmacy practice course. All students participated in lecture, a practice lab, and a practicum exam. The intervention was an active learning activity during the practice lab. In the control group (Group A), students responded to a patient scenario by preparing a written dialogue. In intervention Group B, students conducted an MI session with a “mock” patient. In intervention Group C students conducted an MI session with a peer. At the completion of the semester, all students will participate in a practicum exam assessing MI skills while counseling a standardized patient. The Behavior Change Counseling Index (BECCI) will be used to compare skill level before and after practice lab and practicum exam. Measures of knowledge, confidence, and attitude will be assessed after lecture, practice lab, and practicum using the Self-Assessment Quiz and Confidence and Attitude Survey. Comparisons will be made across and within groups using ANOVA. Results: This is a work in progress, final results will be presented at the meeting. Implications: The results of this study will be used to inform development and implementation of teaching and assessment methods for patient care skills pertaining to health behavior change.

Impacting Student Pharmacists’ Academic Success through Tutoring and Supplemental Instruction. Kimberly J. Dunn, Campbell University, William M. Moore, Campbell University, Amber H. Johnson, Graduate Assistant, Valerie Hoots, Graduate Assistant.
Implementation and Effectiveness of a Structured Debate in Advanced Pharmacy Practice Experiences. Kendrea M. Jones, University of Arkansas for Medical Sciences, Catherine E. O’Brien, University of Arkansas for Medical Sciences, Holly D. Maples, University of Arkansas for Medical Sciences. Objectives: To describe the implementation of a structured debate in an advanced pharmacy practice experiences (APPEs) and evaluate students’ perception of their ability to critically evaluate primary literature. Method: Fourth year pharmacy students participate in a structured debate. They work in teams and are assigned a controversial pharmacotherapeutic issue with instructions to submit 3 to 5 articles 48 hours prior to the debate from which they derive their argument. Students then participate in a structured debate with a preset format. Students on rotation during the 2010-2011 school year were asked to complete a pre- and post-debate survey to self-assess their experience and ability to present and evaluate primary literature. The survey instrument used a 4-point Likert scale for all items. Results: Data collection is ongoing and analysis will be complete by the 2011 AACP meeting. To date, 19 students have participated in the debate and 11 (58%) have completed both surveys. Preliminary results reveal significant improvement in students’ perceived ability to search for primary literature and explain technical concepts such as number needed to treat (p < 0.05). Additionally, a trend towards improvement in students’ perceived ability to present primary literature was found (p = 0.06). Implications: The use of a structured debate during APPEs may be an effective teaching method to continue to develop students’ literature evaluation skills.

Implementation of an Interprofessional Seminar Series on an Academic Health Center Campus. Stephanie F. Gardner, University of Arkansas for Medical Sciences, Cindy D. Stowe, University of Arkansas for Medical Sciences. Objectives: To prepare future physicians, nurses, pharmacists, and allied health and public health professionals to use electronic health records, evidence-based medicine, medical decision support, and point-of-care tools to reduce errors, improve standards of care, address HIPAA requirements, and meet accreditation standards. Method: Five seminars were scheduled during the academic year to occur during 2 hour blocks (4 to 6 pm) in which students from all colleges could attend. The typical seminar session included a one-hour lecture, followed by a panel discussion and facilitated discussion with faculty members from each college in each auditorium. The one-hour lecture portion of the session had the actual lecturer in one of the rooms, and the live session was shown by videofeed in the other auditoria. The five sessions were Team Based Care, Using New Technologies in a Clinic/Hospital Setting, Ethical and Legal Issues in a World of Electronic Health Records, Patient Safety and Improved Outcomes, and Patient Centered Care. Attendance was mandatory for all students and the seminar was linked to a required course in each of the colleges. Results: A total of 735 students attended, with a mix from each college in each of 4 auditoria (CHR-25%, COM-25%, CON-27%, COP-18%, and COPH-5%). Implications: This seminar series is one part of our development and validation of a model for interdisciplinary electronic health record and medical informatics training, and will be supplemented by online modules and hands-on training when fully developed.

Implementing Team-Based Learning into an OTC/Self-Care Course. Stacey R. Schneider, Northeast Ohio Medical University, Timothy R. Ulbrich, Northeast Ohio Medical University, Daniel L. Krinsky, Northeast Ohio Medical University. Objectives: Team-based learning (TBL) is an instructional strategy that enhances active learning by shifting the focus from a traditional based lecture to one of knowledge application. The purpose of this project is to describe the implementation of team-based learning into the OTC/Self-Care course at NEOUCOM. Method: During the fall block of PI year students completed the OTC/Self-care portion of the Pharmaceutics
Course. Three faculty were involved in delivering the material for this course. Meetings were conducted between faculty to ensure consistent delivery of material throughout the sessions. Each session was two or four hours long and included an individual readiness assurance test (IRAT), group readiness assurance test (GRAT), and group application process (GAP) to promote application of key concepts. A pre and post survey was administered to the students to assess the effectiveness of TBL. The students provided peer evaluations twice during the course. Results: Surveys showed students spend more time preparing for TBL lectures as compared to traditional lectures. Students indicated that group work helped them to better understand the material and led to increased participation with their peers. Students’ comfort assigning peer feedback also increased. Scores were higher in group assessments versus individual assessments. Implications: Implementation of TBL in an OTC/Self-care course was an effective active learning teaching model. In the future, similar strategies will be explored as opportunities for teaching in other courses.

Implementing a Formalized Faculty Development Process for Pharmacy Residents on an Academic Rotation. Sian Carr-Lopez, University of the Pacific, Suzanne M. Galal, University of the Pacific, Selina Tam, Health Plan of San Joaquin, Andrea C. Rieland, San Joaquin General Hospital, Lara Haddad, NorthBay Medical Center, Saduf A. Ashfaq, University of the Pacific, Jace Hargis, University of the Pacific. Objectives: The objective of this project is to describe the implementation and impact of providing a short course on adult teaching and learning for pharmacy residents prior to classroom experience. The effects will be examined from the residents’ and the students’ perspectives. Method: Pharmacy residents from three residency programs elected to complete a longitudinal academic rotation. The first component involves completion of a four-part faculty development series at the University’s Faculty Center for Teaching and Learning which includes the following topics: andragogical learning theory; assessment using formative, qualitative and rubric generation; higher education instructional models including inquiry-based, Socratic, and divergent higher level Bloom questioning; and emerging educational technology. The second component involves leading weekly classroom discussion sessions with fifth-semester pharmacy students. The impact of the short course will be assessed in three ways. Results: A pre- and post-assessment tool relating to adult learning strategies will be completed by pharmacy residents prior to and after completing the short course. Students will then complete an evaluation of their discussion session, some of which will be led by residents and others by pharmacy faculty. Scores for residents will be compared to scores for faculty. A questionnaire will be completed by the residents after completing the entire experience to assess their views on the utility of the short course, as well as the impact of the experience on their interest in a career in academia. Implications: The utility of an activity promoting student learning has not been formally evaluated. A survey has been developed to assess student comfort regarding product-specific information prior to and after participation in the interactive display. This will help assess the utility and impact of this activity. Survey results will be gathered in May 2011. Implications: By providing an interactive, hands-on product display with devices and medications that are readily available over-the-counter, the authors anticipate it will result in enhanced student learning and comfort with use of the included products. This activity can be easily implemented in other programs seeking to expand the promotion of self-care education.

Inclusion of Advanced Pharmacy Practice Experience-Related Activities within a Required Patient Assessment Course. Marissa Salvo, University of Connecticut, Lisa Holle, University of Connecticut, Lauren S. Schlesseleman, University of Connecticut. Objectives: To develop, integrate, and evaluate effectiveness of advanced pharmacy practice experience (APPE)-related activities, including journal club presentations, SOAP note writing, and communication of patient-specific plan, into a required patient assessment course for third-professional year students. Method: Before the semester start, course coordinators developed the innovative activities and associated grading rubrics. Small groups of students (2-3) have been assigned a “landmark” trial to succinctly present and answer questions. Course coordinators will evaluate students’ delivery of trial information and presentation skills. Three written SOAP notes will be required; course coordinators will develop patient cases and evaluate accurate and professional completion all SOAP note components. Students are required to individually present one SOAP note assessment/plan to a mock interdisciplinary team. Course coordinators will assess the student’s oral communication skills and incorporation of appropriate details for the assessment/plan. At the end of the semester, students will be asked to complete an anonymous online survey to evaluate and provide feedback on teaching innovations. Results: Course currently in progress. Results of survey, feedback, and subsequent planned course revisions will be presented at 2011 AACP Annual Meeting. Implications: The activities will provide students with the platform to practice literature evaluation and delivery, SOAP note composition, critical thinking skills in proposing a patient-specific assessment and plan, and effective delivery of recommendations before beginning APPEs. Following successful completion of the course, students will be better prepared for APPEs and will be familiar with landmark clinical trials that have shaped clinical practice for commonly encountered disease states.

Implementing an Interactive Home Product Display Activity in a Self Care Course. Mary M. Bridgeman, Rutgers, The State University of New Jersey, Rupal Mansukhani, Rutgers, The State University of New Jersey, Danielle Candelario, Rutgers, The State University of New Jersey. Objectives: To describe the implementation of an interactive home care product and diagnostic device display in a self-care course. Method: Self Care and Home Care (4 credits) is a mandatory course offered in the third professional year. The course is structured according to disease state blocks that include didactic lecture supplemented by interactive, case-based review sessions. Students are additionally required to participate in a one-hour home product display activity session. In this activity, students rotate through ten product stations and complete a worksheet that requires them to evaluate and compare product labeling to determine appropriate patient counseling. Students have the opportunity to “taste test” innocuous agents in addition to utilizing the home diagnostic devices. This interactive session is intended to better prepare students for providing patient counseling on use of these products. Results: The utility of an activity promoting student learning has not been formally evaluated. A survey has been developed to assess student comfort regarding product-specific information prior to and after participation in the interactive display. This will help assess the utility and impact of this activity. Survey results will be gathered in May 2011. Implications: By providing an interactive, hands-on product display with devices and medications that are readily available over-the-counter, the authors anticipate it will result in enhanced student learning and comfort with use of the included products. This activity can be easily implemented in other programs seeking to expand the promotion of self-care education.

Incorporating Advanced Pharmacy Practice Experience (APPE) Students into Clinical Research as a Required Rotation Assignment. Kathleen Vest, Midwestern University’s Chicago College of Pharmacy, Mary Ann Kliethermes, Midwestern University’s Chicago College of Pharmacy. Objectives: The objective of this study is to evaluate the benefit to APPE students’ of completing a small research study and scientific paper as a required assignment on an ambulatory care clinical rotation. Method: APPE students were required to develop a research idea and work together (in groups of 2-3 students) during their rotation block to collect and analyze data and report results in a scientific paper. Research topics focused on collecting
Innovative Teaching Strategies within the Curriculum of a Newly Established College of Pharmacy. David W. Stewart, East Tennessee State University, Stacy D. Brown, East Tennessee State University, Cheri W. Clavier, East Tennessee State University, Michael A. Crouch, East Tennessee State University. Objectives: To evaluate how a newly established (< 6 years) college of pharmacy compares to a national benchmark relative to active learning strategies. Method: The authors previously conducted and published (in press) a nationwide survey regarding active learning strategies utilized in U.S. colleges of pharmacy. These data will be used to compare the East Tennessee State University Bill Gatton College of Pharmacy to national trends in active learning using a follow-up survey administered only to ETSU faculty. Identified predictors of active learning use, including faculty rank, age, teaching workload, and department will likewise be evaluated for validation purposes. Results: The ETSU faculty demographics differ from nationwide faculty survey respondents by two major factors. ETSU reports 33% of its faculty teach in basic sciences, compared to 25% of respondents in the national survey. Additionally, a higher percentage of ETSU faculty hold the rank of assistant professor, compared to national respondents (67% versus 42%). Anecdotal reports from faculty indicate some use of active learning strategies at ETSU, including team-based teaching, case-based teaching, and guided inquiry; however, a comprehensive analysis comparing ETSU with nationwide peers in the utilization of active learning is ongoing and will be complete by late spring. Implications: This will be the first comparison of a specific institution to national benchmarking data, which will help validate predictors of active learning. This sample is ideal for comparison due to the differences in demographics described above. Furthermore, these indicators could be helpful during curriculum planning for other colleges and schools of pharmacy.

Incorporating an Introductory Pharmacy Practice Experience into a Federally Qualified Health Center. Lauren S. Bloodworth, The University of Mississippi, Laurie Warrington, The University of Mississippi, Lorelei Lucas, The University of Mississippi, Leigh Ann Ross, The University of Mississippi, Vera Brooks, G.A. Carmichael Family Health Center. Objectives: To describe the incorporation of an Introductory Pharmacy Practice Experience (IPPE) in a Community Health Center through the University of Mississippi (UM) School of Pharmacy. Method: The UM Delta Pharmacy Patient Care Management Project was implemented in 2008 to demonstrate the impact of pharmacist medication therapy management (MTM) services on clinical, economic, and humanistic outcomes and to increase access to health providers/services in the underserved Mississippi Delta. Through this project and the Health Resources and Services Administration Patient Safety and Clinical Pharmacy Services Collaborative, clinical pharmacy services have been implemented in the G.A. Carmichael Family Health Center. School of Pharmacy faculty work in collaboration with a family medicine physician in this patient-centered medical home model to provide MTM services for high-risk diabetes patients (hemoglobin A1c > 9%) one day per week. Third professional year students have been incorporated into this model and assist with comprehensive medication reviews, medication adjustments, and disease education. This ambulatory IPPE rotation is 4 hours per week for 5 weeks during each semester. Results: IPPE students followed a total of 13 patients through 30 total encounters. Data collection is underway and will be available for presentation at the 2011 AACP Annual Meeting. Implications: As the practice model evolves, more pharmacists will be integrated with the patient care skills and confidence necessary to provide direct patient care services.

Instructional Effectiveness and Student Perceptions of a Student Response System in a PharmD Practicum Course. Suzanne M. Galal, University of the Pacific, Emily K. Chan, University of the Pacific, Jenana Maker, University of the Pacific, Jace Hargis, University of the Pacific. Objectives: Lectures, while expedient for instructors, do not inform the instructor on how well students are mastering the material. Clicker remote response systems allow instructors to ascertain students’ understanding of the course work efficiently and in real-time. The instructor’s goal was to determine students’ perceptions and course material retention with the use of clickers in a pharmacy practice course. Method: Practicum 1 is a course that is offered in the first semester of a three year accelerated PharmD program. Students enrolled in this course were randomly selected for treatment, which consisted of using clickers to increase engagement, while learning smoking cessation concepts over a two hour class session. Students in the control group received standard, high quality instruction without the use of clickers. A pre and post assessment was developed to ascertain student perceptions and attitudes, as well as successful retention of smoking cessation content. The survey was administered in class at the start and at the completion of the smoking cessation module. Results: Pre and post assessment results will be analyzed using SPSS to determine if there are correlations between the use of clickers and better understanding and retention of material. Also, results will determine if the students’ attitudes and perceptions were modified. Implications: The outcomes of the students pre and post assessment will provides instructors with valuable feedback needed to determine the effectiveness of clickers for enhanced instruction.

Integrated Clinical Case Based Studies Improve Students’ Perception and Performance in Basic and Clinical Sciences. Ayesha A. De la Fuente, Texas A&M Health Science Center, Srikanth Kolluru, Texas A&M Health Science Center, Darren Roesch, Texas A&M Health Science Center. Objectives: To determine if an integrated clinical case with team based active learning would improve the students’ perception and performance in basic and clinical sciences in the integrated pharmacotherapy course. Method: A clinical faculty member develops a clinical case to which basic sciences faculty develops questions to be answered by the students individually (IRAT = Individual readiness assurance test) and in teams (TRAT= Team Readiness Assurance Test) prior to assessing and developing a plan for the clinical case. Basic sciences questions were written in a
manner that the knowledge of which would help in the assessment and planning of the case. This activity was executed prior to the integrated pharmacotherapy exam to assess its impact on students’ performance on the exam. A pre and post survey was administered to determine if students’ attitude towards applying basic and clinical sciences in the decision making for the case had changed or improved. Results: Student surveys indicated the integrated active learning team based exercise improved their ability to learn basic sciences concepts and improved their ability to apply basic sciences when assessing and developing clinical plans. The active learning exercise also improved the students’ performance on the integrated pharmacotherapy exam. Implications: Integrated active learning activities allow students to learn and apply basic sciences knowledge in order to assist with therapeutic clinical decisions.

Integration of Transdermal Formulation Development and Clinical Trial Design in the Pharm.D. Curriculum. Nicole K. Brogden, University of Kentucky, Patrick McNamara, University of Kentucky, Karen Blumenschein, University of Kentucky. Objectives: The objective of this work is to promote student knowledge and understanding of the processes involved in designing all elements of a Phase I clinical trial for testing a new drug formulation in human subjects. Method: This project utilizes a hybrid learning style comprised of didactic lecture and small group activities. Students will design Phase I studies to test the clinical utility of hypothetical transdermal formulations of captopril, morphine, or naltrexone. Completion of the project will result in full conceptualization of trial design, including definition of a subject population, determination of endpoints, selection of study design and statistical analyses, and completion of documents for human subject protection. Endpoints to be evaluated include student knowledge relative to appropriate selection of trial elements (i.e. study design, statistical tests, correct inclusion/exclusion criteria for subjects) and student attitudes, assessed via questionnaires. Results will be analyzed with descriptive statistics. Results: This work is in progress and will be completed by April 2011. Implications: As pharmacist involvement in pre-clinical and translational research continues to increase, it is critical that Pharm.D. programs provide formal training in the process of designing effective and ethical trials. This activity will help students to compare the role of current products to the potential utility of new formulations, while concurrently integrating the concepts of pharmacokinetics, clinical trial design, statistical analysis, and human subject protection. Overall, this process will allow students to synthesize information from concurrent coursework, while providing an understanding of the need for a pharmacist’s unique knowledge base in trial design.

Interprofessional Collaboration to Provide Fall Risk Assessments for Seniors. Kelli L. Coover, Creighton University, Ann M. Ryan-Haddad, Creighton University, Edward M. Saito, Creighton University, Teresa Cochran, Creighton University, Marlene Wilken, Creighton University, Ioy Doll, Creighton University, Kate Martens Stricklett, Creighton University, Julie Kaminski, Seven Oaks of Florence. Objectives: To offer an interprofessional fall risk assessment program at a subsidized senior independent living facility. Method: Students and faculty from four health disciplines collaborated to provide balance assessments, home safety checklists, and medication reviews to reduce fall risk for seniors residing in subsidized housing. The program is being offered Spring 2011. Nursing and pharmacy students are doing in-home interviews using the College Community Health Assessment, a standardized assessment tool that evaluates health and wellness in areas such as memory loss, nutrition, balance and mental well-being. Health data from the College Community Health Assessments will be used to evaluate fall risk. Physical therapy students are conducting Berg Balance Assessments and occupational therapy students are completing home safety checklists. All students will participate in a care conference several times during the semester to review health information and develop recommendations to improve quality of life for senior participants. Results: The quantitative assessment data and qualitative care conference information will be presented according to the students’ health profession. Implications: The Collage Community Health Assessment is being offered to 15 subsidized senior housing sites in the United States. Because of staff and budget limitations, the community partner would not be able to efficiently complete the assessments for the 80 residents. Student healthcare professionals will provide the manpower to complete the assessments. This community engagement opportunity allows students to interact with seniors, become proficient with a health assessment form, collaborate interprofessionally, and provide clinical recommendations.

Level of Participation and Long-term Impact of a Peer Evaluation of Teaching Program. Jennifer A. Santee, University of Missouri-Kansas City. Objectives: To determine the number of faculty who participated in a voluntary faculty peer evaluation program, whether faculty being evaluated incorporated feedback, and whether observed faculty feel that student evaluations and performance improved as a result of participation in this program. Method: A peer evaluation program was provided during the 2009 - 2010 and 2010 - 2011 academic years. Faculty evaluating others were trained on best educational practices, giving constructive feedback, and the use of a standardized form to provide feedback. Results: The number of faculty who served as evaluators and who were evaluated will be summarized. Evaluated faculty will be surveyed as to whether they incorporated the feedback and whether student evaluations and student performance improved after participation in the peer evaluation of teaching program. Implications: Published articles discussing peer evaluations of pharmacy faculty report a low number of faculty volunteering to observe others. The authors concluded that reluctance to participate was a result of faculty not feeling qualified to evaluate. This study seeks to determine whether formal training encourages a sufficient number of faculty to be evaluators. Previous work investigating the impact of peer evaluation programs collected impressions immediately after being observed by peers but not after they had a chance to incorporate feedback. Whether such peer evaluations result in actual changes in teaching methodology and student perceptions or performance will hopefully be brought to light with this study.

Longitudinal Didactic Review Examinations during Advance Pharmacy Practice Experiences (APPE). Kimberly K. Daugherty, Sullivan University, Hieu T. Tran, Sullivan University. Objectives: To enhance student retention and to actively prompt students to review for APPE activities and licensure examinations. Method: During APPEs students will take a 200 question pharmacy practice exam and 30 question law exam during their 2nd, 4th, 6th, and 7th (out of 8) pharmacy practice experience. All exams are delivered electronically. Students must pass all four exams with a score of $\geq 75\%$ prior to graduation. Students will be given three chances to pass each exam. Results: Students have currently completed 2 sets of both practice exams. The average on the first pharmacy practice exam was a $61\% \pm 0.13$ and students needed all three attempts to pass the exam. The average on the first law exam was $72.6\% \pm 13.4$ and students needed all three attempts to pass. The average on the second pharmacy practice exam was a $81\% \pm 0.047$ and only 2 students needed more than
one attempt to pass. The second law exam average was 82.1% ± 7.15 and only 4 students needed additional attempts to pass. Implications: Students’ passing success has improved from the first set of exams to the second. Allowing students multiple attempts at one exam as well as multiple exams may help students better retain information from one exam to another. Use of these practice exams may allow students to actively study for licensure exams during their APPEs will hopefully help improve scores on the national exams.

**Medication Therapy Management in an Employer-Based Setting in the Mississippi Delta.** Lauren S. Bloodworth, The University of Mississippi, Leigh Ann Ross, The University of Mississippi, Laurie Warrington, The University of Mississippi, Courtney S. Davis, The University of Mississippi, Megan Minor, The University of Mississippi. Objectives: To assess clinical, economic, and humanistic outcomes among employees participating in a Medication Therapy Management (MTM) program provided by pharmacists. Method: Pharmacists screen employees of the Viking Range Corporation in Greenwood, Mississippi, for blood glucose, lipid, blood pressure measurements and assess health literacy. Inclusion criteria include fasting glucose >100 mg/dL or a diagnosis of diabetes. Pharmacists provide one-on-one MTM sessions on-site, which include a comprehensive medication review, disease-specific education, and recommendations to the primary provider for medication-related problems. Follow-up visits are scheduled at least quarterly. Clinical outcomes include changes from baseline in HbA1c, lipid, blood pressure, body mass index (BMI) measurements, and influenza vaccination. Economic outcomes include changes in healthcare costs for the insurer. Humanistic outcomes include changes in employees’ perceptions about their health, employers, and insurer, and work productivity. Additional outcomes include changes in disease knowledge and health literacy. Results: 74 of approximately 150 targeted employees at three plants have been screened to date; 71 of 74 screened were enrolled. Initial MTM visits have been completed for the 31 enrolled patients. Data collection continues and results will be presented at the 2011 AACP Annual Meeting. Implications: Diabetes is responsible for a significant proportion of healthcare costs and devastating complications. Given the high prevalence of diabetes in the underserved Mississippi Delta region, identifying a strategy to curb disease progression and the associated economic burden is critically important. A successful on-site employer-based pharmacy MTM service could be replicated throughout this region and in similarly challenging rural populations throughout the nation.

**Moral Development and Applied Bioethical Reasoning in Pharmacy Students.** Lauren S. Schlesselman, University of Connecticut. Objectives: This cross-sectional design study explores differences in moral reasoning ability and the use of professional ethical principles among pharmacy students and preceptors to determine the role of ethics courses and clinical experiences on moral and ethical development. The research hypothesis, based on the cognitive structuralist theory of moral development, is that experiential education and professional experience would play a greater role in moral and ethical development of pharmacy students, than didactic ethics courses, because of the exposure to actual moral dilemmas. In particular, it aims to answer the question of when and/or if changes occur in how pharmacy students would handle a specific hypothetical dilemma and with what ethical principle they are influenced. It also aims to answer when and/or if moral development, as measured by the DIT, occurs during their education. Finally, the study aims to provide an exploration into the relationships between ethical principles utilized and the level of moral development. Method: Participants in this survey-based study were selected through a convenience sample of pharmacy students and preceptors. The survey consists of the newly developed Pharmacy Ethical Dilemmas Survey (PEDS) which will evaluate how they would deal with specific healthcare-related ethical dilemmas and which moral rule or ethical principle was most influential in their decision, the DIT-1®, and demographics. Results: Results are currently under analysis Implications: Results of this study will be utilized by the curriculum committee to refine how and when ethics is taught in the pharmacy curriculum.

**Multidisciplinary Education with Older Adults in Their Home.** Mary Beth O’Connell, Wayne State University, Carol Stutrud, Wayne State University, Jennifer Mendez, Wayne State University School of Medicine, Nelia M. Afonso, Wayne State University. Objectives: To assess learning related to senior healthcare, home visits, and multidisciplinary care during a pharmacy and medical student home visit to an older adult. Method: Pharmacy students completed a training session on social constructs influencing health and medication use and practiced the assessment tools. A third year pharmacy student was matched with 1-2 second year medical students to conduct a one to two hour older adult home visit. Pharmacy students assessed interpretation of pill bottle labels, cap opening ability, pill color discrimination and social constructs related to medication use. Medical students used the social context review of systems questionnaire and assessed for activities of daily living. Students recorded assessment findings. They completed an aging semantics differential scale and learning survey before and after the visit and a faculty developed post visit learning survey. Descriptive statistics utilized. Results: Students found 3% - 14% of the older adults had a deficit in an aspect of pill bottle knowledge or medication use. The percent of students stating that they learned a lot or much about social impacts on seniors’ health and medication use were 36% and 45%, respectively. Many pharmacy students thought interdisciplinary care will improve senior care (66%) and that home visits provide additional needed information (73%). Many students thought the experience was worthwhile (63%) and would recommend the program (61%). Remaining surveys and data still need to be analyzed. Implications: Based on student learning, the program will be continued and expanded to add social work and another year of students.

**NY State Hospital Pharmacy Capacity Survey-Experiential and Employment.** Richard O’Brotta, St. John Fisher College, Karl Fiebelkorn, University at Buffalo, The State University of New York, Andrew Flynn, Albany College of Pharmacy and Health Sciences, Judianne Slish, St. John Fisher College. Objectives: With the ACPE Standards 2007 requiring increased number of rotation hours in the introductory and advanced experiences, and the possibility of two new schools of pharmacy seeking pre-candidate status in NY State the quantity of available rotation sites in the hospital setting is a concern. In addition internships and/or employment is necessary for students to achieve a fulfilling career. The objective of this study is to quantify the availability of hospital experiences for pharmacy students in NY State. Method: Hospital Pharmacy Directors in NY State will be surveyed via electronic means to quantify their capacity to accept students for rotations, internships, and full time employment. Results: The information obtained from the results of the survey will be analyzed by the Academy of Academicians which is affiliated with the Pharmacists Society of the State of New York. The data will be shared via poster format with US Pharmacy Schools during the American Association of Colleges of Pharmacy annual meeting. Implications: The results of this study should inform current and potential future pharmacy schools by assessing the ability of hospital systems within NY State.
to accommodate pharmacy students for rotations, internships, or fulltime employment.

Outcomes From High Risk Assessment of Third-Year Student Drug Knowledge. Glenn Anderson, Texas Tech University Health Sciences Center, Ronald Hall, Texas Tech University Health Sciences Center, Harold Miller, Texas Tech University Health Sciences Center, Arthur A. Nelson, Texas Tech University Health Sciences Center.

Objectives: To assess student and curricular outcomes arising from assessment of P3 student drug knowledge. Method: A high risk drug knowledge assessment (HRDKA) program was approved by faculty in reaction to perceived student deficits. Drug knowledge was operationally defined within 9 domains: medication names, indications, normal dosages, mechanism of action, common side effects, contraindications, drug interactions, laboratory assessment, and pharmacokinetic/pharmacodynamic properties. The HRDKA was developed through linkage to the 9 drug knowledge domains and 13 pharmacotherapeutic areas. All items were written by faculty, tested, and reviewed/revised by a panel of faculty prior to inclusion within the HRDKA. In January 2011, a 166 item assessment (75% criterion) was administered to all P3 students. Results: Ten HRDKA items were dropped from the assessment due either to poor item performance or grammatical errors. Overall test reliability was 0.82 with a test-retest reliability of 0.80. The mean overall student score was 88.4% ± 5.2%. One hundred thirty of 131 students (99.2%) passed the HRDKA. Individual domain passing rates ranged from 52.7% to 100.0% with the pharmacokinetic domain being the most challenging. Within individual pharmacotherapeutic areas, passing rates were lowest within the Integumentary (62.6%) and Psychiatry (74.8%) pharmacotherapeutic areas. Implications: The high HRDKA pass rate suggests overall student knowledge deficits may be overestimated. However, student performances within pharmacokinetics/pharmacodynamics and some pharmacotherapeutic areas suggest curricular improvements could be beneficial and should be pursued.

Overcoming Logistical Barriers of Small Group Interprofessional Problem-Based Learning (IP-PBL): A Large Classroom IP-PBL Pilot. Lynda M. Eccott, The University of British Columbia.

Objectives: Interprofessional problem-based learning (IP-PBL) has been shown to be an effective learning strategy for fostering interprofessional, collaborative, patient-centred learning. However, significant barriers (eg. differing schedules, levels of expertise, number of disciplines per group) make it challenging to create groups that are well ‘matched.’ These inequities can hinder the learning outcomes of IP-PBL. The goal of this project was to determine the effectiveness of a large classroom IP-PBL session, which was independent of requiring equal representation from each discipline and level within a professional program. Method: This project was conducted in term 1 of a fourth year case-based pharmacy course in 2 (2.5 hour) classes. In addition to pharmacy students (n=94), students from medicine, nursing, physiotherapy, occupational therapy, social work, and dentistry were recruited. (n=34) Student numbers and disciplines were divided over the two classes. Through a facilitated large class discussion, students worked through the module in their uni-professional groups, but were given structured opportunities to share their scope of practice and patient-centred tasks with the other professions. The students were able to construct a multidisciplinary patient-centred care plan. This project is being conducted again in term 2, with our 2nd pharmacy cohort (n=50). The effectiveness of the delivery method in both terms will be evaluated using a post-module questionnaire. Results: The case, discussion questions, evaluation tools and data will be presented. Implications: Large classroom IP-PBL provides the flexibility needed to overcome the logistical barriers of including this valuable interprofessional opportunity in our programs.

P1 Students as Simulated Patients: Impact on Introductory Pharmaceutical Care Skills Performance. Elizabeth A. Musil, Concordia University, Wisconsin, Joseph Rinka, Concordia University Wisconsin, Michael C. Brown, Concordia University Wisconsin.

Objectives: To measure the impact of P1 students participation as simulated patients on their performance in pharmaceutical care skills delivery and compare their performance with non-simulated patient students. Method: Students at Concordia University Wisconsin School of Pharmacy begin to develop pharmaceutical care skills in the first semester of curriculum and display their proficiency of delivering these skills in Applied Patient Care Teaching Lab with simulated patients and cases. Students may serve as simulated patients during pharmaceutical care delivery from peers. Students’ performances are assessed with rubrics’ ratings: likely harmful (LH), needs improvement (NI), acceptable (A), exceptional (E). Students receiving no LH ratings provide academically satisfactory care, a subset of whom provide practice-appropriate care by earning only A and E ratings. Any LH result is unsatisfactory care. We compared the performance of simulated patient students versus non-simulated patient students. Results: Throughout the semester, 66 of 72 (91.7%) pharmaceutical care delivery simulations by simulated patient students and 175 of 212 (82.5%) by non-simulated patient students rated as academically satisfactory care (p=0.085), moreover the frequency of practice-appropriate care was 44.4% and 27.3%, respectively (p=0.008). On the end-of-semester OSCE, 18 of 18 (100%) simulated patient students and 48 of 53 (90.6%) non-simulated patient students rated as academically satisfactory care (p=0.32), and the delivery of practice-appropriate care was 61.1% and 35.8%, respectively (p=0.096). Implications: This initial assessment demonstrates that students serving as simulated patients provides an educationally meaningful benefit to their own skill development. Future efforts will explore expanding students’ opportunities as simulated patients and the longer-term impact on their skill development.

Patient Case-Based Oral Examinations: Five Years of Experience Comparing Students’ Performance and Perceptions of Preparedness. Lisa M. Lundquist, Mercer University, Angela O. Shogbon, Mercer University, Kathryn M. Momary, Mercer University, Justine S. Gortney, Wayne State University.

Objectives: To compare students’ performance and perceptions of preparedness for patient case-based oral examinations over a five year period. Method: A case-based individual oral examination was given to all second year pharmacy students enrolled in the cardiovascular therapeutics course for five consecutive years. Prior to the oral examination, voluntary survey completion was requested to assess the students’ perceptions of preparedness on a 4-point Likert scale with 1=extremely unprepared, 2=unprepared, 3=prepared, and 4=extremely prepared. Students’ perceptions of preparedness were compared to performance on the oral examination using descriptive statistics and Pearson’s correlation. Results: A total of 141 (96%) surveys were received year one, 101 (72%) year two, 71 (48%) year three, and 137 (99%) year four. The mean (SD) overall student performance and perception of preparedness for the oral examination were 93.2% (7.45%) and 3.41 (0.34) in year one; 87.5% (6.29%) and 3.18 (0.37) in year two; 72.3% (15.2%) and 2.64 (0.48) in year three; 90.7% (8.99%) and 3.47 (0.35) in year four, respectively. There was little correlation between students’ performance and perception of preparedness in any of the four years (r=0.20, r=0.13, r=0.27, r=0.08, years one...
Implications: Little correlation has been seen between students’ perceptions of preparedness for the oral examination and their actual examination scores in a therapeutics course. Increased utility of case-based oral examinations throughout the curriculum may improve the correlation between students’ perception of preparedness and their performance in making clinical recommendations.

Perceptions of Substance Use Among Pharmacy Students. Erin D. Callen, Southwestern Oklahoma State University, Kristin Montarella, Southwestern Oklahoma State University. Objectives: Substance abuse among health care professionals is an ongoing problem. Pharmacists represent an especially vulnerable population due to their accessibility to and knowledge of prescription medications. Studies regarding self-reported substance use describe varying incidences among pharmacists and pharmacy students. The purpose of this project is to evaluate pharmacy student and faculty/staff perceptions regarding student drug use and current drug policies and procedures at our institution. Method: All first (P1), second (P2), and third (P3) year pharmacy students and faculty/staff at the Southwestern Oklahoma State University College of Pharmacy (SWCOP) will be given a voluntary written survey during class or in a faculty/staff meeting. This survey will consist of multiple questions designed to examine the stated objectives. All survey answers will be on a standardized form and will be placed in a sealed box to assure anonymity. The survey has been pilot tested on P4 students and approved by the University’s investigational review board. Results: To be presented. Implications: The results of the study will be used to gauge perception of student drug use within the SWCOP and to guide recommendations for modifying current drug policies and procedures. If a problem is identified, implementation of more stringent rules regarding drug testing as well as increased efforts through substance use prevention, education, and assistance may be needed. We believe our results will be of interest to other colleges of pharmacy concerned about substance use among students and the potential lack of adequate policies and procedures to identify and assist them.

Perceptions of Pharmacy and Medical Students Towards Interprofessional Practice Prior to Advanced Experiential Training. Mikael D. Jones, University of Kentucky, Donna Weber, University of Kentucky College of Medicine, Yevgeniya Gokun, University of Kentucky, Patricia R. Freeman, University of Kentucky. Objectives: The purpose of this research is to determine the perceptions of medical and pharmacy students toward interprofessional practice prior to starting advanced experiential training. Method: All 2nd year medical and 3rd year pharmacy students were required to complete the Interdisciplinary Education Perception Scale (IEPS) in the spring semester in preparation for a mandatory interprofessional experience. The IEPS is an 18-item questionnaire developed and validated by Luecht that measures 4 attitudes important to interprofessional practice: professional competency and autonomy, perceived needs for professional cooperation, perception of actual cooperation, and understanding the value and contributions of other professions. All surveys were administered electronically via Survey Monkey using a 5-point Likert scale ranging from strongly agree (5) to strongly disagree (1). Descriptive and other appropriate non-parametric statistical tests will be used to analyze the ordinal data and make comparisons of questions/factors between pharmacy and medical students Results: Results from the IEPS surveys will be analyzed and presented. Implications: Establishing health care professional students’ attitudes toward interprofessional practice prior to starting advanced experiential training may be useful in assessing the effects of early experiential activities on attitudes toward interprofessional training. Additionally, the information could be used to develop interprofessional education activities aimed at improving attitudes essential to successful interprofessional practice.

Pharmacotherapy Laboratory Revisions and Impact on Economic Cost and Educational Experiences. Casey Gallimore, University of Wisconsin-Madison, Susanne G. Barnett, University of Wisconsin-Madison, Andrea L. Porter, University of Wisconsin-Madison, Karen Kopacek, University of Wisconsin-Madison. Objectives: Over the past 18 months, Pharmacotherapy Laboratory course coordinators at the University of Wisconsin-Madison School of Pharmacy have revised the laboratory curriculum in an effort to improve efficiency while decreasing expenditures and maintaining quality educational experiences and overall course objectives. The aim of this study is to retrospectively determine the degree of cost savings and the impact course revisions have had on student educational experiences. Method: Course coordinators decreased laboratory periods from three to two hours in duration. Key active learning activities remained in lab while the use of a course management system allowed for increased student preparation outside of class, including the use of online tutorials. Course expenditure data for the academic years prior to and following the implemented changes was compared to determine cost savings. Student course evaluations, exam scores, and overall course grades for the same years will be exported as unidentified data from the course management system. Data will be compared to evaluate student educational experience and learning outcomes prior to and after the implemented laboratory revisions. Results: Preliminary results indicate course expenditures were decreased by 67% and 48% during the fall and spring semesters respectively. Results regarding student course evaluations, exam scores, and overall course grades are still pending. Implications: Laboratory revisions improved in-class efficiency and reduced course expenditures. Further analysis of course evaluation and grading data will allow investigators to assess the impact on students’ educational experiences.

Pharmacy Educators’ Experience and Views on Academic Dishonesty. Melanie N. Mabins, University of Kentucky, Holly S. Divine, University of Kentucky. Objectives: Recent reports of academic dishonesty at one college of pharmacy have prompted discussions among faculty regarding what constitutes academic dishonesty, how the violation is handled, and if there is need for more structure and consistency in the college’s honor code policy. There is little information published on faculty opinions and practices related to academic dishonesty in health professions and no publications among pharmacy faculty. The hypothesis is that pharmacy educators’ descriptions and reporting of academic dishonesty vary greatly within the same college. The primary objectives of this study are to quantify faculty experiences with academic dishonesty and determine if there are inconsistencies in interpretation and handling of violations. Method: A survey will be administered to approximately 80 faculty members within two departments. Subjects will be recruited by an investigator at a college-wide faculty meeting. The questionnaire will be anonymous and no protected health information will be collected. The survey is designed to collect demographic information, faculty experience with academic dishonesty, and opinions of academic dishonesty. Finally, case scenarios will be presented to determine how individual faculty interpret and respond to violations. Subjects will be given the option to complete the survey electronically via Survey
MonkeyTM or on paper. Results: A summary and comparison of pharmacy educators’ descriptions, reporting, and management of academic dishonesty will be presented. Implications: Identifying the level of inconsistency and barriers to recognizing, reporting, and managing violations could be helpful in creating more structured policies throughout the college.

Pharmacy Student Response to Assessing Harlem K-2 Students for Health Literacy/Medication Safety Knowledge. Craig A. Kovera, Touro College of Pharmacy-New York, Shelly Warwick, Touro College of Pharmacy-New York. Objectives: To evaluate the role of Pharmacy School candidates (PSCs) in assisting children in grades K through 2 during pre- and post-assessments in a research study. Method: PSCs were recruited to participate in an assessment for HealthStart!, a collaboration between Touro College of Pharmacy, Touro-Harlem Medical Library, and the Children’s Health Education Foundation (CHEF), to address community need for education in medication safety and health literacy. The 1st year and 2nd year PSCs underwent training to work one-on-one with K-2 students in a unique assessment involving electronic clickers. Thereafter PSCs completed a 10-item survey including questions on extent of participation, how they assisted the children, and preferred method of helping if the assessment was repeated. Results: Pre-assessment was successfully completed and children are participating in a curriculum involving educational materials in different formats before post-testing by project end in March. Initial survey results (n=27) indicate 74% of PSC’s voluntarily assisted in half or more of 6 assessment sessions in one day. 92.5% of PSCs indicated significant or much time was spent counseling the children to help them understand the questions, which was their role, while 100% indicated the child ultimately answered the question. Nearly 93% of students indicated they prefer using clickers over paper/pencil upon repeating the assessment. Implications: PSCs helping K-2 students in an assessment of knowledge about health literacy and medication safety is largely enjoyed, a useful community service, and encourages learning for both parties.

Pharmacy and Therapeutics Committee Active-Learning Activity in a Large Classroom Setting. Sandra L. Balinger, Northeastern University, Debra J. Reid, Northeastern University. Objectives: Formulary development and pharmacy and therapeutics (P&T) committees are lecture topics included in a required Drug Information and Evaluation course. An active learning project was incorporated to provide students the opportunity to apply knowledge and skills and assess their perceived abilities before and after a simulated formulary management process. Method: Twelve teams of approximately ten second year students prepared written drug monographs and then gave summary presentations to a mock P&T committee (i.e., their classmates and faculty). The entire class used clicker technology to vote on the formulary status for each medication under review. Students were surveyed before and after participating in this activity about their knowledge of the lecture topics and ability to perform formulary management tasks. Examples of questions included: I can describe what a formulary is and I can determine the most appropriate clinically relevant information to include in a formulary drug monograph. A five point strongly agree to strongly disagree scale was used. Results: At the start of the lecture series, 56% of students strongly agreed or agreed that they could describe what a formulary is, but only 10%-20% of students strongly agreed or agreed with the statements describing more complex competencies. Upon completion of the activity, 74% to 96% of students strongly agreed or agreed with all statements. Implications: Participation in this active learning activity can improve students’ knowledge and skills. This model may be used by other schools of pharmacy interested in using active learning in a large class to convey formulary development and P&T committee processes.

Preparing Future Pharmacists for Expanded Scopes of Practice: Physical Examination Instruction in U.S. Pharmacy Curricula. Shelley M. Jones, University of Kentucky, Jeff J. Cain, University of Kentucky, Yevgeniya Gokun, University of Kentucky, Frank Romanelli, University of Kentucky. Objectives: To compare physical examination (PE) instruction between US pharmacy schools since the implementation of ACPE Standards 2007. Method: A survey was developed to gather information on content and methods of instruction and evaluation for PE courses in US pharmacy curricula. The survey will be mailed to Pharmacy Practice department chairs or their equivalents at all US pharmacy schools with at least ACPE pre-candidate status and will also be available electronically via the REDCap™ platform. Survey implementation will follow established methods by Dillman. Data collected that pertains to PE content will include categorical data, such as organ systems covered. Survey questions will also address timing of PE course in the curriculum, course design, number of contact hours, instructional and evaluation methods, instructor credentials, and collaboration with other health disciplines. Descriptive statistics will be used to describe characteristics of PE courses. Demographic information pertaining to the institution will also be collected for purposes of comparing PE characteristics between schools using appropriate statistical methods, (i.e. public vs private, traditional vs. accelerated programs, etc). Comparison will also be made between schools that offer PE as a separate course versus those that integrate the topic within other courses correcting for differences using multivariate logistic regression. Results: Will be presented after analysis. Implications: Differences identified may signify potential curricular gaps that may need to be addressed as pharmacy pursues federal recognition as health care providers. Differences may also highlight the need for a standard approach to teaching and evaluating this skill-based topic.

Process of Evolving Skills Assessment Rubrics: An Attempt to Decrease Inter-Rater Variability. Stacey R. Schneider, Northeast Ohio Medical University, Timothy R. Ulbrich, Northeast Ohio Medical University, Seth P. Brownlee, Northeast Ohio Medical University. Objectives: Having multiple evaluators use a Likert scale for skills based activities may lead to inter-rater variability. Based on student and faculty feedback, assessment rubrics at Northeast Ohio Medical University (formerly Northeastern Ohio Universities College of Medicine and Pharmacy (NEOUCOM)) were changed to reflect minimum competencies (e.g., via check-boxes) rather than the accumulation of points (eg., via Likert scale rubrics). The purpose of this project is to describe the development and implementation of minimum competency rubrics into the Pharmacist Patient Care Experience Courses (PPCE). Method: At NEOUCOM, students are enrolled in PPCE- a longitudinal course dedicated to developing skills learned in the didactic curriculum. The PPCE course directors observed considerable inter-rater variability when rubrics based on a Likert scale were used for skills assessments. Since the NEOUCOM curriculum uses a pass/fail grading system requiring students to meet specific baseline competencies, the Likert scale-based rubrics were transitioned to competency-based rubrics. Course directors postulated that this change would result in less inter-rater variability and would identify more students requiring remediation. Results: The revised rubrics were introduced into the curriculum during the 2010-2011 academic year. Formal feedback from the students and evaluators in addition to the number of students that needed to
remediate the activities before and after the change in rubrics will be presented. Implications: The ability to fairly predict competency in pharmacy skills is important. Even well-trained raters may have difficulty in consistently assessing a student using a Likert scale. Using competency based rubrics to assess skills may provide a method for more consistent evaluations.

Professional Development: A Seminar Approach. Jennifer A. Tilleman, Creighton University, William R. Hamilton, Creighton University. Objectives: Pharmacists are expected to exhibit professionalism in all aspects of practice, as well as their personal life. The development of these professional traits may not occur automatically for all students, but rather should be explicitly “taught” as an integral part of the curriculum. Creighton is committed to forming men and women of conscience and compassion. Professional Development Seminar is a series of courses throughout the didactic years of the curriculum that introduces and reinforces a variety of pharmacy topics and provides an opportunity to engage the student in reflection related to personal and professional growth. Method: The series was developed as part of a major renovation of the didactic curriculum for the pharmacy program at Creighton. The content is based on the previous Early Practice Experience curriculum plus incorporates suggestions from the faculty to include a broad perspective of the unique characteristics of the pharmacy profession. The series consists of a one credit hour, Satisfactory/Unsatisfactory course each didactic semester that meets weekly. Results: A quantitative and qualitative analysis of student evaluations and faculty reflection will be used to describe the strengths and weaknesses of the initial course. Implications: It is the hope that this series will provide students with an opportunity to explore the complexities of the pharmacy profession and to look back at their individual development as a pharmacist.

Prospective Measurement of a Problem-Based Learning Course Sequence for Pharmacy Students. Jacqueline L. Olin, Wingate University, Christian R. Dolder, Wingate University, Gregory Alston, Wingate University. Objectives: To measure the effects, over time, of a problem-based learning (PBL) sequence on the skills, knowledge, and abilities it is designed to enhance. Method: The PBL pharmacotherapy case study sequence is comprised of four one-credit hour courses required of all second- and third-year pharmacy students. Each semester, groups consisting of 6 to 7 students and a faculty tutor meet twice weekly. The course sequence purpose is to provide students with the opportunity to gather, analyze, and synthesize medical information from a patient case to formulate pharmacotherapeutic treatment plans designed to improve patient outcomes. This process should enhance students’ ability to be independent and active learners, foster individual and group problem solving abilities, promote critical examination of medical problems, and develop clinical skills and reasoning. Student performance related to select course objectives was assessed at baseline and prior to each subsequent semester using a case-based work sample test. Students documented their reasoned answers using a standardized form. Investigators analyzed the forms to calculate total and sub-item performance scores. Results: Seventy-three second-year pharmacy students were enrolled into the course sequence and 93% consented to participate in the research component. Total and sub-item scores will be presented from the first year of the study. These data will also be compared to course performance, overall school of pharmacy performance, and performance on annual assessment examinations. Implications: If successful, the analysis may allow for an objective assessment of the PBL sequence and enable instructors to make modifications for enhancing student learning.

Rising Tides Lift All Boats: A Grassroots Approach to Establishing Professionalism and Academic Integrity Standards. Krista Capehart, University of Charleston, Michelle R. Easton, University of Charleston, Julie A. Testman, University of Charleston, Andrew Wellman, University of Charleston. Objectives: High standards of professionalism, integrity, and personal responsibility are essential to pharmacy’s reputation and the delivery high-quality patient care. In response to breaches of academic integrity and growing discontent among faculty and students, the University of Charleston School of Pharmacy created an Ad Hoc Committee on Academic Integrity and Professionalism (AHCaIP). AHCaIP was charged to research key issues and develop implementation strategies to improve the professional culture. Method: AHCaIP was comprised of eleven individuals including students, faculty, staff, practitioners, and two ex-officio members. AHCaIP formed Relationships, Integrity, and Judicial subcommittees which met weekly over a three month period and were open to all members of the UCSOP community. A Final Report was provided to the Dean and encompassed each subcommittee’s recommendations and the committee’s overall outcomes. Results: Preliminary outcomes included defining faculty/student expectations to facilitate communication and improved relationships, clarification of the disciplinary process, and the student-driven development of an Honor Code. A follow up survey to determine the impact of the AHCaIP is in progress and results will be presented. Implications: Feedback to date indicates increased ownership and a higher awareness of accountability in meeting professional expectations and standards. Use of a collaborative approach involving UCSOP community stakeholders sets the stage for future handling of situational crises.

Amazing Self Care Race. Heidi Eukel, North Dakota State University, Jeanne E. Frenzel, North Dakota State University, Elizabeth Skoy, North Dakota State University. Objectives: To assess student knowledge of self care therapeutics and evaluate the ability of students to formulate recommendations during a fast paced game. Method: Second year professional pharmacy students were divided into pairs and were given a “pharmacy passport”. Six stations were themed as follows: Pediatric Dehydration, Pediatric Dosing, Natural Medicines, Cough & Cold, Gastrointestinal Health, and Fever. Students groups drew a question from a station, formulated an answer, and presented their recommendation to the pharmacist faculty member. If the recommendation was acceptable, their “pharmacy passport” was stamped and they were directed to the next pharmacy station. If their recommendation was incorrect, the student group was directed to the “Counseling Roadblock” where they were required to counsel on home monitoring devices. Results: An anonymous survey was administered to all student participants prior to and after the activity. The percent of students that agree or strongly agreed they are confident in their ability to advise patients on nonprescription medications increased from 49% to 83%. The percent of students that agree or strongly agreed they are confident in their ability to recommend herbal therapy increased from 5% to 29%. The percent of students that agree or strongly agreed they can accurately evaluate a nonprescription medication and analyze its safety, efficacy, and appropriateness based on a patient complaint increased from 45% to 68%. Implications: The Self Care Amazing Race assessed student knowledge of self care therapeutics and ability to formulate recommendations “on their feet”. Student confidence in self care therapeutics increased as a result of this activity.

Self-Directed Learning (SDL) Pilot in a Pharmacotherapy Course With and Without a Web-based Learning Tool. Shaun E. Berning, University of Colorado, Sherwood Wang, University of Charleston. Objectives: To compare different self-directed learning strategies to determine which produces the best learning outcomes. Method: This study involved 76 students, 34 in the control and 42 in the experimental groups. The students were given the same case studies and study materials for different weeks. The control group was not allowed to access the web-based tool while the experimental group used the tool for both the case studies and reference materials. Results: The experimental group outperformed the control group in terms of both understanding and application of pharmacotherapeutic treatment plans designed to improve patient outcomes. Implications: The web-based learning tool has the potential to enhance self-directed learning and improve the overall learning outcomes.
Simulating Medication Reconciliation via Active Learning in a Pharmaceutical Care Skills Lecture Setting. Nichole M. Kulinski, University of Minnesota, Angela K. George, University of Minnesota, Jennifer L. Lockwood, University of Minnesota, Robert R. Nichols, University of Minnesota. Objectives: 1) To assess students’ perceived learning benefit from medication reconciliation simulation. 2) To investigate barriers to small group simulation in the lecture setting. Method: All students enrolled in the Pharmaceutical Care Skills IV course were required to complete a pre-lecture module on the process of medication reconciliation. The students reviewed articles and an online presentation that introduced why the medication reconciliation process is necessary, how it is conducted, when each step occurs, and who is involved. In lecture, a patient-admission medication reconciliation process was simulated in groups of three, where each student played the role of the pharmacist, standardized patient, and evaluator. After lecture, students were instructed to reconcile the medication list gathered in class with on-line physician orders. Students submitted their recommendations and concerns about the active orders. Students also completed online survey questions focusing on lecture discussion and overall activity. A focus group was also conducted for more detailed feedback. Results: Results will be available in July. The survey data will identify students’ perceptions of the activity’s impact on learning. The focus group and survey comments will be winnowed down to identify specific barriers and potential innovations to advance our small group simulations in the lecture setting. Implications: The Joint Commission mandates that accredited institutions implement a medication reconciliation process. When pharmacists conduct medication reconciliation, errors are reduced and patient safety is improved. This activity may provide an essential learning opportunity to better prepare students for experiential education. In addition, evaluating the small group lecture format may influence future activity design.

Small Group Capstone Cases for Teaching Geriatric Pharmacotherapy Concepts. Lynda H. Oderda, The University of Utah. Objectives: To provide students with the skills needed to identify and address complex medication-relation problems in the growing senior population using capstone cases at the end of a didactic therapeutics sequence. Method: Students were assigned readings about geriatric-related issues including medication appropriateness and medication discontinuation at the end of life prior to four lectures in an end-of-life therapeutics geriatric module. After a brief lecture, students worked in small groups to identify potential drug-related problems in increasingly complex geriatric cases. Cases incorporated therapeutic concepts taught over 3 semesters. Each group created a care plan to address identified problems, with timelines for follow-up. Students then discussed their plans at the end of each case to illustrate the multiple approaches to problem-solving. Results: Course evaluations indicated that 97% of students agreed/strongly agreed that students were encouraged to ask questions, 89% agreed/strongly agreed that clinical applications were discussed in this module and 81% agreed/strongly agreed that this was an effective use of teaching tools. Representative comments included a preference for more inclusive instructor notes, and demonstration of prioritization and care plans prior to small group activities. Implications: Pharmacists need to be prepared to solve complex medication problems in a rapidly growing older population, expected to reach approximately 72 million by 2030. A small group approach to teach problem-solving in the classroom prepares students for actual patient encounters in clerkships. Changes are planned for Spring 2011 based on student feedback emphasizing importance of active learning to problem-solving, and instructor demonstration of the care plan process.

Standardized Approach to Patient-Based Pharmacotherapy Notes in a Cardiovascular Therapeutics Course. Angela O. Shogbon, Mercer University, Lisa M. Lundquist, Mercer University, Kathryn M. Momary, Mercer University. Objectives: To evaluate the effectiveness of utilizing a standardized approach to patient-based pharmacotherapy notes, specifically the Subjective Objective Assessment Plan Education (SOAPE) note format, to improve students’ knowledge of patient-based documentation in a cardiovascular therapeutics course. Method: A total of five weekly patient case discussion sessions are incorporated into a cardiovascular therapeutics course for second professional year pharmacy students. Students are given a patient case to work-up utilizing the SOAPE note format prior to the discussion session, and come prepared to discuss the case and the appropriateness of their pharmacotherapy note. During the second half of the case discussion session, students are given a second part of the case to complete an in-class SOAPE note that is graded. In addition, a SOAPE note approach to patient cases is incorporated into all lectures throughout the course. A pre-test and post-test assessing students’ knowledge on preparation of SOAPE notes and level of confidence in this task will be administered at the beginning and end of the course respectively. Results of the pre-tests, post-tests, and student performance on SOAPE notes will be compared utilizing descriptive statistics and paired t-tests. Results: During the spring semester, the pre-tests and post-tests will be administered and evaluation of knowledge base and level of confidence completed. A comparison of results at the beginning and end of the course will be presented. Implications: A standardized approach to patient-based pharmacotherapy notes may help to enhance students’ understanding and readiness to perform this vital task in other courses, on experiential rotations, and in professional practice.

Standardized Assessment of Observed Structured Clinical Examina- tions. Mary Beth O’Connell, Wayne State University, Francine D. Salinitri, Wayne State University, Julie M. Smith, Wayne State University.
Student Documentation of Professional Activities Across the Curriculum. Mary J. Starry, The University of Iowa, Jay D. Currie, The University of Iowa, James D. Hoehns, The University of Iowa, Sandra J. Johnson, The University of Iowa, Lisa DuBrava, The University of Iowa, Hazel H. Seaba, The University of Iowa. Objectives: Documentation by pharmacy students of their professional activities is key both for assessment of the range and diversity of activities available and for students to demonstrate responsibility for reporting those activities. This poster will explain a documentation system (PxDx/C228) that enables pharmacy students (P1-P4) to document their professional activities electronically. Students are introduced to the evaluation of their documentation by pharmacy faculty and are expected to reflect on their professional activities throughout their education. Results: Data analysis is in progress. Implications: If a group of faculty members can predict student OSCE performance, external validation could be eliminated, thereby decreasing time and cost of OSCE testing.

Student Perception of Performance on a High-Stakes Objective Structured Clinical Examination (OSCE). Erika L. Kleppinger, Auburn University, Jan Kavookjian, Auburn University, Seth Hill, Auburn University, Raymond A. Lorenz, Auburn University, Amy R. Donaldson, Auburn University. Objectives: To compare student perception of performance on a high-stakes Objective Structured Clinical Examination (OSCE) with faculty and standardized patient evaluations in a PY1 skills course. Method: At the end of the Fall semester, PY1 students enrolled in a skills-based course are evaluated using a 5-station OSCE. Students are expected to demonstrate responsibility for documenting their professional activities across the curriculum.

pharmacists seem to have a good perception of how they performed on their first high-stakes OSCE.

**Student Self Assessment of a Professionalism Pledge.** Richard O’Brocta, St. John Fisher College, Todd Schoen, St. John Fisher College, Kimberly Swigart, St. John Fisher College, Megan Sullivan, St. John Fisher College, Todd Dewey, St. John Fisher College, Randy Rahman, St. John Fisher College. **Objectives:** Student professionalism within pharmacy education is a very large and frequently cited topic. A search of the AJPE using the term professionalism resulted in 19 citations within the title, 35 within the abstracts and 22 within key words. In October 2009 the Student Government, through an inclusive process, created a professionalism pledge for students of the Wegmans School of Pharmacy. The pledge based on the patient-pharmacist relationship as described in the Student Professionalism White Paper of the June 2009 issue of Pharmacotherapy. This year Student Government would like to assess how well the students are abiding by this pledge via an anonymous student survey. **Method:** Student members of the Pharmacy Student Government Association identified and approved one criterion per professionalism tenet. These criteria will become the questionnaire that will be used in the self-assessments used in the survey tools. P1, P2, and P3 students will be surveyed in class using the Turning PointTM system (clickers); The P4 students will be surveyed using i-mail using the QualtricsTM tool. The data will then be summarized and analyzed by the student government. The results of the survey will be shared with all students, staff and faculty. **Results:** To be analyzed. **Implications:** A self-assessment overseen by the student government can identify the strengths and weaknesses of the student body as it relates to adherence of a professionalism pledge. In the future student government may be able to identify interventions to improve adherence.

**Student Task Force: An Interprofessional Approach to Syphilis in San Antonio.** Qing Xu, The University of Texas at Austin, Bin Xiao, The University of Texas at Austin, Aimee Smith, University of Texas at San Antonio, Carisia Garcia, University of Texas Health Science Center San Antonio, Efrem De Huges, University of Texas at San Antonio, Ryan Araíza, University of Texas Health Science Center San Antonio, Sima S. Momin, University of Texas Health Science Center San Antonio, Enrique Flores, University of Texas at San Antonio, Veronica S. Young, The University of Texas at Austin. **Objectives:** According to health officials, cases of syphilis in Bexar County, San Antonio from 2000 to 2009 have increased by 147%. Syphilis is highly contagious but completely preventable and treatable if detected early. The objectives of this community service learning (CSL) project are to: develop strategies to prevent and increase awareness of syphilis in Bexar County specifically targeting the HIV population, and to facilitate interprofessional collaboration among students from different professions. The Student Task Force (STF) comprised of eight students representing four professions. Faculty from five professions served as mentors. **Method:** The STF visited a local HIV clinic and community based organizations (CBOs) to conduct a needs assessment to identify gaps in syphilis education and treatment. Students collaborated to create educational materials to distribute to CBOs. Agendas and deadlines were established through monthly meetings among students and faculty mentors, while clinic and CBO visits and educational materials were completed independently among students. **Results:** The STF produced a patient-centered educational poster and video to promote syphilis prevention and awareness in the community. These were presented to a group of faculty mentors and representatives from CBOs for a final evaluation. Students also submitted reflections of their experience upon completion of the course. **Implications:** Through this collaborative effort, each student is able to contribute and bridge gaps in knowledge and experience to better manage this patient population. The educational tools developed reflect the perspectives of each profession. Pharmacy student participation in an interprofessional CSL project effectively prepares students to serve as leaders in a multidisciplinary healthcare environment.

**Student Perceptions and Performance in a Physical Assessment Course: Is There a Link?** Nataliya Shinkazh, Touro College of Pharmacy—New York. **Objectives:** Touro College of Pharmacy students take the physical assessment (PA) course in their first academic year. Limited research exists regarding student perceptions of PA courses in the Doctorate of Pharmacy curricula. There may be a link between initial student perceptions and subsequent course performance. The objectives are 1) to correlate student pre-course perceptions with performance in the midterm and laboratory practical; 2) assess overall changes in student perceptions after the completion of individual laboratory sessions. **Method:** Prior to the start of the course, students were surveyed via a Likert scale for their perceptions of the topics to be covered throughout the semester. Changes in overall student perceptions of the course will be monitored via surveys after individual laboratory sessions. Student performance in the PA course will be matched with initial pre-course survey responses to observe a possible link between initial perceptions and course performance. **Results:** Eighty four out of 90 students completed the pre-course survey. Students will perform various PA examinations, including, but not limited to: mini-mental status, reflexes, blood pressure, diabetic foot, blood glucose, and peak flow rate examinations. Survey results and correlations between perception and performance will be presented at the meeting. **Implications:** A link between student perceptions and course performance may exist in the PA course. This link could exist in other courses of the Doctorate of Pharmacy curricula. Assessing baseline student perceptions of a course may help instructors target and enhance student perceptions, leading to improved overall course performance.

**Student Perceptions of a Required Immunization Course.** Meghan K. Sullivan, University of Maryland, Cherokee Layson-Wolf, University of Maryland. **Objectives:** In an effort to enhance professional development within in the curriculum, and advance the profession of pharmacy, the APHA Pharmacy-Based Immunization Delivery certificate program has been incorporated into the abilities lab sequence at the University of Maryland School of Pharmacy. **Method:** Prior to the start of the training program, second year students enrolled in the course were asked to complete a survey regarding their perceived knowledge, skills and attitudes towards pharmacy-based immunizations. At the conclusion of the programming, the students were administered the same survey to assess the impact, if any, that the immunization training course had on their views of pharmacy-based immunizations. Items addressed by the survey included, but were not limited to, the depth of knowledge of pharmacist involvement in immunization services, the value of immunization training for pharmacists, the role of the training program in the course, and the level of confidence and comfort of students in providing immunizations. In addition, basic information regarding current or intended practice sites of the students was collected to examine the possible impact this information on the individual respondent’s views of pharmacist involvement in immunization services. **Results:** At present, data is undergoing analysis. **Implications:** Future implications include continued course quality improvement to promote pharmacy-based immunization knowledge and enhance student perceptions and comfort regarding the delivery of immunizations.
Student Perceptions of the APHA/ASCP Medication Therapy Management Program in a Doctor of Pharmacy Curriculum. Stuart J. Beatty, The Ohio State University, Marialice S. Bennett, The Ohio State University, Ruth E. Emptage, The Ohio State University. Objectives: 1) To evaluate the impact of the didactic portion of the APHA/ASCP MTM Certificate Program and/or completion of Advanced Pharmacy Practice Experiences on student perception and knowledge of medication therapy management (MTM). 2) To determine the number of students who choose to complete the required post-work to receive the APHA/ASCP MTM Certificate upon graduation. Method: All students enrolled in a 3rd year Capstone course were required to attend the didactic portion of the APHA-ASCP MTM Certificate Program. The students were encouraged to complete 5 patient cases as the post-work portion in order to receive the certificate upon graduation. An original survey was developed to determine if student perception and knowledge of MTM is impacted by the delivery of the lectures and/or by completion of Advanced Pharmacy Practice Experiences. The survey was administered before and two weeks after the didactic portion was delivered. Students will complete the survey a third time prior to graduation, one year after the didactic portion was delivered. Results: A total of 123 students completed the didactic portion of the MTM Certificate Program and completed the first two surveys. To date, 59.3% (73/123) of students are completing the post-work required for the MTM Certificate. Data analysis with appropriate statistical methods will be performed following final survey completion. Implications: Results of this project will determine student perceptions of incorporating the APHA/ASCP MTM Certificate Program into a Doctor of Pharmacy curriculum. Future directions may include requiring post-work to be completed as part of experiential education.

Students’ Attitudes Toward the Use of Text Messaging as a Response System in the Classroom. Kisha O. Gant, Xavier University of Louisiana, Kristi I. Rapp, Xavier University of Louisiana. Objectives: Student engagement is valuable in the enhancement of student learning. Tools and techniques, such as audience response systems, are available to assist educators with engaging students in the classroom. There is currently no data available in the pharmacy literature that assesses the use of text messaging as a means to promote student interaction during class. Method: One hundred and fifty-six second year pharmacy students received two lectures that incorporated questions that students answered via text messaging. The website Polleverywhere.com was utilized to create the questions and display real time results during the PowerPoint presentation. Students participating in the study completed an 18 item survey that assessed attitudes, usefulness, and effectiveness of the use of text messaging as a response system in the classroom. Additional survey items included cellular phone ownership, mode of communication preference, and frequency of text messaging. Results: Ninety four students participated in the survey. Forty-eight percent of the students strongly agreed and 36% agreed that they were more engaged/interested in lectures with text messaging surveys. Additionally, 17% of students strongly agreed and 38% agreed that text messaging survey questions improved their problem-solving, critical-thinking, and analytical skills. In addition, a majority of the students answered that text messaging should be used for most lectures (45%). Implications: Text messaging survey questions may enhance student learning by engaging the students and utilizing a widely available response system.

Students’ Performance and Perceptions of Preparedness to Critically Evaluate Literature: Three Years Experience. Lisa M. Lundquist, Mercer University, Kathryn M. Momary, Mercer University. Objectives: To compare third-year pharmacy students’ performance and perceptions of preparedness (POP) to critically evaluate literature before and after a focused application activity. Method: Students providing informed consent voluntarily completed a survey assessing their POP to critically evaluate literature in a third year course before and after a focused application activity including didactic lecture, active learning, individual review, and classroom discussion of primary literature articles. Students rated their POP on a 4-point Likert scale ranging from extremely unprepared to extremely prepared. Knowledge assessment was completed concurrently with the survey. Data were compared with Pearson’s correlation, paired t-test, and Student’s t-test. Results: In years one and two 116 (80.5%) and 112 (75%) students consented for participation, respectively. The overall POP (mean±SD) improved from 2.24±0.49 to 2.79±0.48 (p<0.0001) in year one and from 2.30±0.39 to 2.84±0.52 (p<0.0001) in year two. Initial and follow-up knowledge assessments also improved both years (55.6±17.8% to 68.4±18.4% (p<0.001) in year one and 51.6±21.6% to 66.3±19.8% (p<0.001) in year two). In both years, there was a statistically significant correlation between the initial and follow-up knowledge assessment and POP. There were no differences in POP or performance between years one and two. Data for year three will be collected and presented. Implications: Students’ POP and performance improved after the focused application activity and POP correlated well with the knowledge assessment utilized. Repeated incorporation of critical literature evaluation throughout the curriculum may be necessary to improve perception and performance.

Survey of U.S. Pharmacy Schools Regarding Incorporation of IOM Report Recommendations Within the PharmD Curriculum. Caroline S. Zeind, Massachusetts College of Pharmacy and Health Sciences-Boston, Mary Amato, Massachusetts College of Pharmacy and Health Sciences-Boston, Susan Jacobson, Massachusetts College of Pharmacy and Health Sciences-Boston, James Blagg, Massachusetts College of Pharmacy and Health Sciences-Boston. Objectives: To determine the extent of implementation of Institute of Medicine (IOM) recommendations for five core competencies (patient centered care, interdisciplinary teaming, evidence based practice, quality improvement, and informatics) within the pharmacy curricula of PharmD degree schools in the U.S. Method: A 24-question survey instrument was formulated using IOM language to define each of the IOM recommended competencies. An AACP email distribution list was provided following approval by the Institutional Review Board. In November 2010 the survey was sent electronically to Pharmacy Practice Chairs of 120 U.S. Schools of Pharmacy to either complete or designate to an individual for on-line completion via Zoomerang. Follow-up emails with the survey were sent over the next two months. Descriptive statistics were used for data analysis. Results: To date, 65% of pharmacy schools have responded and final results will be summarized after one additional survey request. Combining the two highest possible survey scores of 4 and 5, with 5 indicating “to a great extent”, patient-centered care and evidence-based practice have been the most widely implemented of the five core competencies, (83% and 84% respectively), with informatics, interdisciplinary teaming, and quality improvement to a lesser extent (36%, 30% and 26% respectively). Implications: While significant progress has been made for inclusion of IOM competencies relating to patient centered care and evidence based practice, the areas of informatics, interdisciplinary teaming, and quality improvement are lagging in inclusion. The study results will be useful in determining a baseline to identify areas for improvement and measure progress going forward.
Survey of Technologies Used by Pharmacy Faculty for Instructional and Non-instructional Purposes. Eric A. Wombwell, University of Missouri-Kansas City, Pamela Ochoa, Texas Tech University Health Sciences Center, Jeffery D. Evans, The University of Louisiana at Monroe. Objectives: Assess and report the usage of various instructional and non-instructional technologies used by faculty members. Determine if rates of technology use for non-instructional purposes influence use of technology for instructional purposes. Method: Investigators have created an electronic survey that has been emailed to college of pharmacy faculty members. The survey consists of a list of technologies. Respondents are asked to select both those technologies used for instructional and non-instructional purposes. Results: Data collection is ongoing. Implications: Results will provide pharmacy academia insight into the extent and type of technology in use. This data may assist colleges in determining which or whether to purchase specific technology. This work may also open dialogue about specific technologies between potential users and current users.

Survey Results for Exam Remediation at U.S. Colleges of Pharmacy. Kimberly K. Daugherty, Sullivan University, Meghan M. Bodenberg, Sullivan University, Maria Lourdes Ceballos-Coronel, Sullivan University, Hieu T. Tran, Sullivan University. Objectives: Sullivan University College of Pharmacy (SUCOP) students are allowed to remediate any regular exam (not finals) in which they score less than a 69.4%. The exam remediation and plan are determined by the course coordinator and respective department chair. Upon successful completion of remediation students will receive a score of 70%. This poster will describe the SUCOP examination remediation process and determine if students find the remediation process helpful. A secondary objective is to compare our remediation process with other US Colleges of Pharmacy. Method: A survey was given to all PY1 and PY2 students enrolled at SUCOP 2009-2010 (n=161). A nationwide survey was conducted of US Colleges of Pharmacy to determine whether exam and course remediation is offered and if so how it is conducted. Results: Forty-four percent of PY1/PY2 students surveyed had remediated one exam, 22% remediated 2 exams, and 34% had remediated more than 2 exams. Students felt that remediation helped them retain information for future exams. Eighty percent of students felt remediation was helpful. The nationwide survey had a 13% response rate representing 47 US Colleges of Pharmacy. Sixty-four percent of the colleges do course remediation and 30% do exam remediation. Overall faculty and students felt both course and exam remediations were useful. Implications: The results of our SUCOP student survey show that students felt remediation was helpful to them. This is echoed in the nationwide survey which showed similar results for Colleges that do exam and course remediation.

Systematic Approach to the Delivery of a Drug Literature Evaluation Course. Pamela H. Koerner, Duquesne University, Holly C. Lassila, Duquesne University, John R. Tomko, Duquesne University. Objectives: The objective of this course restructuring was to identify an effective way to present a drug literature evaluation course. Method: Content was divided into distinct topic areas: study design, methodology, statistics, and analysis. Within each topic, a select number of didactic lectures were devoted. Reflective exercises were given on the first day of each topic block and due at the end of that lecture series. In addition, application sessions were designed for the students to review articles and complete a set of questions applicable to the topic just presented. Articles were chosen that mirrored areas covered in current therapeutics courses. After reviewing the articles by topic areas, 6 classes remained for application sessions where students did a complete review of articles and discussed as a class. In addition, the course contained one longitudinal reflective experience. Students were provided with an article at course commencement and asked to answer a core set of assessment questions. The exercise was duplicated at the end of the semester where they were to reanalyze the article and update their previous response. The intent was to show skill improvement. Results: Surveys were distributed to the 165 students who participated in the past semester course. It contained 7-likert questions on courses core competencies and 3 open-ended questions. Statistical analysis is currently being conducted to evaluate the responses and will be presented in the poster. Implications: Division of the course material into learning blocks with reinforcement exercises is an effective way to present and develop drug literature evaluation skills.

Teleconferencing Pilot in an Online, Previously Asynchronous Pharmacotherapy Course. Shaun E. Berning, University of Colorado, Monika M. Nuffer, University of Colorado, Sherwood Wang, University of Colorado. Objectives: *To create team-based practice for applying clinical knowledge in an online course *To gather information on student learning to further study this educational methodology *To increase student/student and student/faculty interaction Method: Online teleconferencing was chosen as the platform to implement team- and case-based learning for applying clinical knowledge and enhancing interaction. This pilot occurred in a multi-topic, one-semester pharmacotherapy course. Online quizzes, threaded discussions and exercises were replaced by introductory patient cases early in the course. Students had the option complete the cases individually or with classmates via optional teleconferencing. In a later unit, students were required to participate in a two-hour teleconference to develop a care plan for a final patient case. They worked in groups of 3-10 students with a faculty facilitator. Learning was assessed by 1) therapeutic decision making during the introductory and final patient cases and 2) comparing exam scores from the pilot to historical data. Interaction was assessed by participation during the teleconference. Students were surveyed on perceptions of the effectiveness of team- and case-based learning, preparation units, and other points; comments were encouraged. A faculty survey is pending. Results: Exam scores mean (historical:pilot): First (72.2%:83.4%); second (89.3%:84.2%) Perceived efficacy mean (N=25; 1=not effective at all, 3=effective, 5=extremely effective) -Case-based learning 3.88; team-based learning 3.52; preparation units 3.76 Implications: -Technology allows major educational methodology changes in a pharmacotherapy course -Student learning and interaction may improve with teleconferenced team- and case-based learning.

The Total Package: Impacting Student Pharmacists’ Professional Development Through Interactive Soft Skills Workshops. Kimberly J. Dunn, Campbell University, Melissa Stancil, Campbell University, Amber H. Johnson, Graduate Assistant, William M. Moore, Campbell University, Patrick M. Conroy, P4 Student. Objectives: To design and implement a professional development instructional series to augment curricular education and training in order to enhance personal and professional success and engender more culturally competent and effective healthcare providers. Method: The College of Pharmacy & Health Sciences utilized the self-assessments and surveys of matriculating Doctor of Pharmacy students to develop a professionalism workshop series. The workshop series includes topics that promote overall character wholeness including but not limited to: public speaking, interviewing skills, resume and scientific writing, learning styles, study skills, goal setting and emotional intelligence, cultural competency, online networking etiquette, business and networking etiquette.
The Design and Piloting of a Teaching Certificate Program for Multiple Partner Pharmacy Residency Programs. Timothy R. Ulbrich, Northeast Ohio Medical University, Kristen Longstreth, Northeast Ohio Medical University, Janis J. MacKichan, Northeast Ohio Medical University, Ellen Whiting, Northeast Ohio Medical University. Objectives: To describe the content, process, and outcomes of a university-sponsored teaching certificate program offered to residents from multiple partner pharmacy residency programs.

Method: University faculty developed and facilitated a series of interactive workshops that engaged residents in discussions about basic teaching skills and academic career paths. Built on the strengths of other institutions’ programs and a longstanding NEOUCOM teaching fellowship, the workshops included the following topics: teaching philosophies, academic portfolios, curriculum development, small and large group teaching, education technology, test item writing, feedback and evaluation of learner performance, and academic careers. Pre and post surveys of residents’ knowledge and skills in eight teaching competencies were administered to set and assess learning objectives and program outcomes. Formal evaluations of workshops were completed. Residents were assigned to teaching activities in large group, small group and precepting settings. Structured feedback was sought from learners, faculty and residency advisors. Residents who compose a philosophy of teaching, complete teaching assignments with self-assessments based on peer/learner feedback and prepare an academic portfolio will be awarded a teaching certificate.

Results: Nine residents from four programs attended four campus-based workshops and taught pharmacy students for a minimum of 12 hours on campus and one month at their practice site. Results from pre- and post-surveys, workshop evaluations, and resident employment will be presented.

Implications: This program provides residents an opportunity to acquire pedagogical knowledge and skills and mentoring in teaching effectiveness. We hypothesize that program graduates will develop confidence in teaching and thus be more likely to consider an academic career path.

There’s an App for That: A Survey of Pharmacy Student Use of Medical Apps. Ashley R. Stimnett, University of Arkansas for Medical Sciences, Leslie M. Ottoson, University of Arkansas for Medical Sciences, Ashley S. Crumby, University of Arkansas for Medical Sciences. Objectives: The objective of this survey is to determine what type of medical apps pharmacy students are using as well as the primary use of these apps. Method: All students enrolled in the UAMS College of Pharmacy will be eligible to participate in this survey. The survey will be created in SurveyMonkey™ and a secure link to the survey will be sent via electronic mail to all college of pharmacy students. The survey instrument to be used consists of multiple choice and free text formats. Students will be asked to choose which medical app(s) they currently or have used in the past from a list of apps. An internet search was performed to determine the most popular medical and pharmacy apps to compile the list of the most commonly used apps. Students will also be asked to identify which apps they use the most often and which apps they wish were provided by the College of Pharmacy. Descriptive and inferential statistics will be utilized to analyze the data. Results: Results of this survey are pending and analyses will be completed by May 2011.

Implications: There are numerous medical apps available for smartphones and PDAs, however, not much data exists regarding pharmacy student use of these apps. This study will provide information on the medical apps available to pharmacy students and those they find most useful. It will also aid Schools of Pharmacy in deciding which apps to supply for their students.

Third-Year Pharmacy Students’ Exposures and Attitudes Toward Research. Jessica M. Cottreau, University of Houston, Joshua Swan, The Methodist Hospital, Melissa S. Medina, The University of Oklahoma. Objectives: As identified at the National Institute of Health Special Conference on Pharmacy Research, there is a need for increased exposure to research early in professional education to maintain an appropriate number of clinical investigators. The objective of this survey is to assess current third-year pharmacy students’ exposure to and perceived knowledge of research and how it relates to the students’ career plans. Method: Third-year pharmacy students at two colleges of pharmacy in United States were given the survey. This survey will be given in person by a faculty member at the end of a scheduled class time. The survey captured each student’s current career plans, perceptions relating to research and factors influencing desire to work on and develop research projects. Primary data analysis will correlate the exposure to research with the interest in research. Secondary analysis will determine the trend in research interests throughout professional education and to determine which aspects of exposure that students would like to increase in their current curriculum. Results: Response rates were 60.7% (85 responses) and 44.4% (60 responses) for each of the colleges surveyed. We hypothesize that students with exposure to research prior to pharmacy school or early in the curriculum will correlate with a higher research interest. Full results and analysis will be presented at the meeting.

Implications: The results of this survey may help to identify possible areas to improve and strengthen pharmacy curricula in order to increase pharmacist research contributions.

Use of Anti-Anxiety Medications, Antidepressants, and Stimulants among Students in a College of Pharmacy. Ashley S. Crumby, University of Arkansas for Medical Sciences, Leslie M. Ottoson, University of Arkansas for Medical Sciences, Ashley R. Stimnett, University of Arkansas for Medical Sciences, Holly D. Maples, University of Arkansas for Medical Sciences, Renee M. DeHart, University of Arkansas for Medical Sciences, Kendrea M. Jones, University of Arkansas for Medical Sciences, Catherine E. O’Brien, University of Arkansas for Medical Sciences. Objectives: To identify the incidence of anti-anxiety, antidepressant, and stimulant use at the UAMS College of Pharmacy and to also identify perceived stressors associated with the use of these substances.

Method: This IRB approved study is being conducted via anonymous paper survey that will be administered to all current UAMS College of Pharmacy students. The survey instrument consists of 6 sections with questions in Likert scale, ranking, and free text formats. Survey categories include study habits, anxiety, depression, and stress. Students will be asked details regarding the use of anti-anxiety medications, antidepressants, and stimulants before and after admission to
Use of Preadmission Criteria and Performance in the Professional Program to Predict NAPLEX Success. Rondall E. Allen, Xavier University of Louisiana, Carroll Diaz, Xavier University of Louisiana. Objectives: To examine various student factors in the pre-pharmacy program and the professional pharmacy program to determine which variable or combination of variables are able to predict success on the North American Pharmacist Licensure Examination (NAPLEX). Method: The study will include over 300 senior pharmacy students who graduated from 2008-2010. Each student gave the College permission to receive their NAPLEX scores. The following student variables will be examined: age upon admission, previous degree, student type (transfer or internal), math/science gpa, pre-pharmacy gpa, pharmacy gpa upon graduation, number of unsatisfactory grades in the pre-pharmacy and professional pharmacy program, and number of out-of-network rotations. Results: Age was not significantly correlated with NAPLEX score but Math/Science GPA, Pre-Pharmacy GPA, and Professional Pharmacy Program GPA were all positively correlated with NAPLEX score (<0.001 for all). The mean Math/Science, Pre-Pharmacy, and Professional Pharmacy Program GPAs were all significantly higher for those students who passed the NAPLEX compared to those who did not pass. There were no significant differences in the proportion of students passing the NAPLEX when compared by Previous Degree and Student Type (p>0.05). A stepwise regression analysis using student preadmission and professional program variables revealed a correlation between the Professional Pharmacy Program GPA and the NAPLEX (p<0.001). Implications: Although its predictability was low, the Professional Pharmacy Program GPA was the strongest forecaster of success and failure on the NAPLEX. Results from this study will be shared with the admissions committee for consideration during the interview and selection process.

Use of Video Technology to Instruct Sterile Compounding in a Patient Care Laboratory Environment. Trenika R. Mitchell, University of Kentucky, Patricia R. Freeman, University of Kentucky. Objectives: Students at the University of Kentucky receive instruction on sterile compounding practices across the Patient Care Laboratory (PCL) course sequence. The objective of the third semester of the PCL sequence is to ensure students can successfully prepare a simple compounded sterile product using basic sterile compounding procedures in preparation for an introductory pharmacy practice experience (IPPE) in community hospitals. Students are assessed on aseptic technique and general sterile compounding knowledge via an IV Practical (IVP). Method: A series of videos outlining various sterile compounding topics was created and made available for student viewing. Students also received traditional didactic lecture and practiced these sterile compounding techniques during scheduled PCL sessions. Each student’s sterile compounding technique was recorded and graded using a standard rubric during the final practice session prior to the IVP. To ensure grading consistency, each assessor graded a standardized video created by the primary lab instructor using the sterile compounding grading rubric. Students received their graded rubrics and were able to review individual videos as needed prior to the IVP. Finally, each student’s IVP rubric and video were released to them. A survey was administered to assess the utility of both the general instructional and individual videos. Results: Data from the surveys will be analyzed and presented. Implications: The use of video technology as an instructional tool for sterile compounding provided consistent student access to examples of proper sterile compounding procedures and allowed students to assess their personal sterile compounding techniques. Use of video technology may enhance student learning of sterile compounding.

Use of a Health Disparities Online Book Club to Impact Cultural Competence. Andrea J. Hannem, University of Minnesota, Nichole M. Kulinski, University of Minnesota. Objectives: 1) To assess the impact of an online health disparities book club on cultural competence of first and second year pharmacy students. 2) To investigate student perceptions of online discussion based learning to foster cultural competence. Method: First and second year pharmacy students were invited to participate in a health disparities book club as an option for a contract for grade requirement. Participants will read either Mountains Beyond Mountains by Tracy Kidder or the Immortal Life of Henrietta Lacks by Rebecca Skloot. Three online discussions will be scheduled to foster reflection and conversation related to specific sections of the book. Participation in a post-book club survey and focus groups will also be required to evaluate the online learning environment and identify barriers to effectively using this format in the course. At the beginning and end of the semester, a cultural competence survey tool will be administered to all students. The change in cultural competence will be calculated for all students. The change in participants of the book club compared to the non-participants to evaluate the impact of this learning experience. Results: Seventy-six students are enrolled in the book club. Data will include pre and post measures of cultural competence for first and second year students, as well as survey data and focus group data from volunteers. Implications: Colleges and schools of pharmacy are seeking creative methods for developing cultural competence. This pilot may provide evidence to support the implementation of online discussions and health disparity book clubs as part of the required coursework in our curriculum.

Use of a Virtual Patient to Prepare to Conduct Diabetes-Specific Medication Therapy Management (MTM). Mara A. Kieser, University of Wisconsin-Madison, Jessica N. Wolf, University of Wisconsin-Madison, Denise L. Walbrant Pigarelli, University of Wisconsin-Madison, Casey Gallimore, University of Wisconsin-Madison, Ruth H. Bruskiewitz, University of Wisconsin-Madison, Joshua M. Thorpe, University of Wisconsin-Madison, Michael E. Pitterle, University of Wisconsin-Madison. Objectives: The objective of this study is to determine if pharmacists and student pharmacists at the University of Wisconsin School of Pharmacy who complete four online medication therapy management (MTM) encounters with a virtual patient develop the necessary skills and confidence to implement MTM services for patients with diabetes in their current or future practice. Method: Project approval was received from the Educational Research Institutional Review Board at the University of Wisconsin.
The intervention is an online program that simulates four MTM encounters between a pharmacist and a virtual patient with diabetes. After each interaction, participants will complete documentation as SOAP notes, prioritize drug-related problem lists, patient medication action plans, and updated personal medication records. Participation in the study is projected at 280 individuals. Participants’ opinions related to MTM and knowledge of diabetes will be measured with surveys and tests related to the three domains of the Theory of Planned Behavior (attitudes, subjective norm, and perceived behavioral control) and the medical care of a patient with diabetes. Survey and test responses pre and post intervention will be compared to determine the effect on participants’ knowledge of and intent to perform diabetes-focused MTM reviews with patients in their current or future practice. **Results:** Study data will be collected between October, 2010 and April, 2011. Of 132 student participants, 80 consented to allow their responses to be included in the study. Pharmacists data is not available as of January 13, 2011. **Implications:** This is an ongoing study and no conclusions or implications can yet be made.

**Using a Home Based Primary Care Program to Train Student Pharmacists in Drug Therapy Management.** Melanie Claborn, *University of Arkansas for Medical Sciences*. **Objectives:** To evaluate the effect of student pharmacist recommendations for drug therapy management for patients enrolled in a Veterans Affairs Home Based Primary Care (HBPC) program. **Method:** A retrospective analysis was conducted using medication reviews performed by student pharmacists utilizing an electronic medical record. The number and types of student pharmacist recommendations, their acceptance rate, and the total number of medications discontinued were evaluated. Students performing these reviews were also asked to complete a survey about the educational value of this activity. **Results:** Currently pending. **Implications:** The HBPC program is a collaborative effort between an interdisciplinary team of healthcare professionals, including pharmacists, who treat chronically ill veterans at home. Student pharmacists meet weekly with an interdisciplinary group to review a portion of patients enrolled in the HBPC program. The student pharmacists review and evaluate drug regimens and make recommendations for drug therapy management. Student pharmacists can potentially prevent adverse drug reactions and improve patient care with their involvement in this team.

**Utility of the Multicultural Awareness Inventory in Assessing P1 Awareness and Directing Cultural Competency Coursework.** Nancy DeGuire, *University of the Pacific*, Keira A. Domer, *University of the Pacific*. **Objectives:** To quantify the cultural awareness of P1 students by surveying their responses to culturally-relevant questions that attempt to predict: a) their innate tendency to treat others differently; b) opportunities and challenges awarded by their cultural characteristics; and c) their self-understanding/cultural pride, with a goal to direct future curricular cultural competency coursework. **Method:** The “Multicultural Awareness Inventory” developed by Halbur was used to assess the cultural awareness of students in the first semester of their P1 year. Data were collected from students in three classes (2008-2010). Student demographic data were collected as part of the survey. In addition, student responses to 18 self-scoring statements about their attitudes and perceptions on multicultural issues were assessed via a 5-point Likert scale. Self-reflective questions were assigned to allow students to develop a plan for continuous cultural professional development. **Results:** 620 students completed the survey instrument and self-reflective questions. Compiled data are being analyzed for trends in cultural awareness subscales and individual question scores. The majority of students self-scored highest on the Cultural Impact scale and lowest on the Self-Cultural scale. **Implications:** Assessment of students’ cultural awareness at the beginning of the pharmacy curriculum can assist faculty in determining a starting point for discussions and devising appropriate ongoing coursework for individual and group learning of cultural competency objectives.

**Utilizing Social Networking to Impact Student Learning: Piloting the Use of Twitter in Pharmacy Education.** Nichole M. Kulinski, *University of Minnesota*, Jude A. Higdon-Topaz, *University of Minnesota*. **Objectives:** 1) To test the feasibility of using twitter technology to foster independent learning and discussion of current topics in pharmacy practice 2) To assess students’ perceived benefit to learning via participation in twitter pilot 3) To evaluate the momentum of student interest and involvement with a social networking system when used for student learning **Method:** Students were invited to participate in a pilot twitter project that required all participants to tweet one post and comment on one tweet each week for 10 weeks. Students were expected to follow each other and be active at least twice a week. A post-activity survey and focus group will be used to understand student experiences and identify barriers to utilizing twitter as a learning platform. **Results:** Results will be available in July. The survey and focus group data will identify students’ perception of how twittering has affected their learning and what barriers they found in completing the requirements of the twitter project. The types of tweets and number of comments and retweets will also be evaluated to investigate student interest and level of student involvement. **Implications:** Twitter and other social networks may bring unique opportunities to engage students in self-directed learning and dissemination of current issues in pharmacy practice. This pilot will identify barriers and evaluate the usefulness of twitter in the classroom experience, so we can better understand how to implement social networking technologies in future coursework.

**Wiki Use to Compliment and Add Value to Learning in a Women’s Health Elective Course.** Elena M. Umland, *Thomas Jefferson University*, Jacqueline M. Klooktyw, *Thomas Jefferson University*, Attia Batool, *Thomas Jefferson University*, Christine Halas, *Thomas Jefferson University*. **Objectives:** To evaluate how Wiki use compliments and adds value to student learning in a women’s health course. **Method:** Wiki posts assigned to third-year (P3) pharmacy students (n=24) in a women’s health elective course provide students the opportunity for self-directed expansion of classroom topics. Assigned groups of 4 students create one original Wiki post related to a classroom topic during the semester; each remaining student independently edits or comments on that Wiki. Results from anonymous online course evaluations are assessed to determine student-perceived value of the Wiki. All Wiki entries posted throughout the course are reviewed and organized into different content categories (e.g., personal reflection, expanded content from trial data evaluation and application or from professional organizations, etc.) to determine if this learning strategy complemented student learning. **Results:** Of the students completing the anonymous online course evaluation (n=21, 88% response), 91% agree/strongly agree that the Wiki is a valuable learning tool. Using a Likert scale (1=minimally, 6=WOW), student response to how the Wikis contribute to their overall course experience is: 1=0%, 2=9.5%, 3=5%, 4=28.5%, 5=38%, and 6=19%. While 81% of the students agree that credit earned for the group post (10% of course grade) is appropriate; 48% feel that credit earned (3% of course grade each) is insufficient for their individual posts. Evaluation of Wiki content is ongoing. **Implications:** Wiki use in a women’s health elective course is perceived by the enrolled P3 pharmacy stu-
students to increase overall course value. Utilizing this form of technology provides another platform for shared student learning.

**SOCIAL AND ADMINISTRATIVE SCIENCES**

**Completed Research**

**A Review of Nontraditional PharmD (NTPD) Programs in the United States.** Brittany Richter, University of Charleston, Fadi M. Alkhatieb, University of Charleston, Tiffany Dotson, University of Charleston, Ciera Powers, University of Charleston, Nguan Pham, University of Charleston, Andrew Wellman, University of Charleston. **Objectives:** The nontraditional PharmD (NTPD) programs provide practitioners who currently have a B.S. in pharmacy the opportunity to further their education and degree with comparable coursework to traditional PharmD programs. In response to the increasing demand of pharmacists and evolving responsibilities of the profession, it is important to review the literature on NTPD programs. **Method:** Articles related to NTPD program were identified via searches of PubMed and IPA from inception to January 2011. A literature review was performed to examine schools offering the NTPD program, their didactic and experiential components of curriculum, length of study, course delivery methods, motivation of practitioners to pursue a NTPD, and comparison to traditional Doctor of Pharmacy programs. **Results:** According to the review of the literature, the NTPD programs coursework is comparable to traditional programs, but differ more in length and method of instruction. Between NTPD programs offered an array of experiential requirements, credit hours, and pace of program exist. Pursuers of a NTPD desired to become more competitive within their current place of employment or against holders of PharmD degrees in the job market. **Implications:** This review offers a comparison of NTPD programs for practitioners to further examine their options to extend their degree. However, more studies need to be conducted to determine if there are differences in residency and employment opportunities between B.S. and PharmD holders. There should also be further research to evaluate employers’ views of hiring traditional or NTPD graduates.

**Assessing Educational and Training Needs of Community Pharmacists Regards Cultural Competence: A Pilot.** Bupendra Shah, Long Island University, Hamid Rahim, Long Island University. **Objectives:** To pilot an assessment of the educational and training needs of community pharmacists by utilizing the Cultural Competence Assessment scale. **Method:** A cross-sectional design was utilized for the study. 98 New York City community pharmacists attending a CE program were asked to complete a questionnaire containing the Cultural Competence Assessment scale (CCA) which measured pharmacists’ cultural diversity experience (CDE), attitude toward cultural awareness and sensitivity (CAS subscale), and cultural competent behaviors (CCB subscale) using a seven point likert scale. Data were entered and analyzed using SPSS version 18.0. **Results:** 64 pharmacists participated in the study. Pharmacists reported interacting with an average of 8.7 (±4.2) racial/ethnic groups. The mean total for the CAS subscale (out of 77) was 58.17(±7.40), indicating pharmacists had moderately positive attitudes toward cultural awareness and sensitivity. The mean total for the CCB subscale (out of 102) was 60.11(±21.32), indicating pharmacists fairly often responded to clients in a culturally competent manner. Items pertaining to the use and availability of resources to learn about clients and families (mean=2.42) and documenting cultural assessment of clients (mean=2.25), and adaptations they made with clients (2.44) had the lowest means, indicating that pharmacists training should focus on utilizing resources and documenting assessment of cultures infrequently encountered while practicing culturally competent behaviors. **Implications:** The CCA allows for identifying pharmacists educational and training needs regards cultural competence. Cultural competence based educational programs should focus on how and where pharmacists can learn more about the cultural groups and how to document and adapt cultural assessments of their patients to patients’ medication therapy.

**Assessment of a Newly Implemented Mobile Computing Requirement.** Jeff J. Cain, University of Kentucky, Helen Garces, University of Kentucky, Frank Romanelli, University of Kentucky, Kelly M. Smith, University of Kentucky. **Objectives:** Determine frequency of on-campus laptop use by pharmacy students Determine student use and satisfaction with technical support, wireless network, and printing services Determine student perceptions of faculty utilization of student laptops in the classroom. **Method:** A 15-item questionnaire was administered online via CourseEval™ to PY1 student pharmacists (N=135). **Results:** All students (N=135) completed the questionnaire for a 100% response rate. A majority of students (N=111, 82%) brought their laptop to school at least 75% of the time and 77% (N=104) took their laptop to at least 75% of classes. Student comments cited availability of PowerPoint™ slides in Blackboard™ for note-taking purposes as the primary benefit of laptops in the classroom. Twenty-five percent (N=34) of students took all class notes on their laptop and an additional 48% (N=65) took some notes on their laptop. There was a mixture of students who strongly preferred taking notes on laptops to students who strongly preferred paper note-taking. Eighteen percent (N=24) of students used the College’s technical support team for assistance and most (N=17) reported satisfactory service. Ninety-five percent (N=128) of students were consistently able to access the wireless network. Only 10% (N=14) utilized the wireless printers with economic reasons cited as the primary rationale for non-use. **Implications:** Overall, students responded positively to the items assessed on the questionnaire. Based on these preliminary results, implementation of the mobile computing initiative can be considered a success from the student perspective. Future enhancements will include a focus on improved technical support and further faculty enrichment regarding laptop utilization during instruction.

**Comparative Impact of Using Peers vs. Standardized Patients on Student Learning of Communication Skills.** Nathaniel M. Rickles, Northeastern University, Phuong Tieu, Walgreens Pharmacy, Anika A. Alam, Northeastern University, Afaf Abdul Baki, Northeastern University, Tammie Nguyen, Northeastern University, Selma Naidjate, Northeastern University. **Objectives:** To compare student learning of communication skills after practicing with peers vs standardized patients (SPs). **Method:** In 2009, 127 students met weekly in one of six sections of a pharmacy communication lab. Students were taped at baseline, midterm (week 5), and final (week 9) using SPs. During weeks 2 to 4, the instructor randomly assigned 3 sections to practice consultations with peers (Group A) and 3 sections to practice with SPs (Group B). During weeks 6 to 8, Groups A and B switched to practicing with SPs and peers respectively. Two trained pharmacy students used a structured assessment form to independently evaluate counseling sessions during the baseline, midterm, and final. Raters were blinded to the timing of the tape. Students were surveyed about their lab experiences. **Results:** Raters indicated significant improvement between baseline and final, and baseline and midterm tapes in both Groups A and B. One rater found significant differences between the final and midterm tapes. Both raters found no significant differences between Groups A and B at baseline, mid-
point, or final. One rater found Group B had significantly improved between the final and baseline (p<0.05). Surveys indicated students experiencing a more realistic scenario with SPs and taking SPs more seriously than peers. Implications: Students performed to the rubric making it difficult to identify SP vs. peer effects. Educators may need to evaluate whether positive student evaluations justify the value of SPs despite costs and possibly no improvement in skills over a less expensive approach.

Curricular Exposure Attitudes of Three Consecutive Years of P-1 Pharmacy Students Toward Pharmacogenomic Testing. Henry H. Cobb, The University of Georgia, Sally A. Huston, The University of Georgia. Objectives: 1) To identify and compare first year first semester (p-1) pharmacy students: a. overall attitude towards pharmacogenetic (PG) testing, b. likelihood of using PG tests at various levels of personal risk and benefit, and c. trust in different groups conducting PG research. 2) To determine if curricular exposure to an ethical PG dilemma had an impact on student attitudes. Method: A 25-question validated instrument (Rothstein, 2003) on attitudes towards PG testing was administered to p-1 students in their first semester before and after curricular exposure to a balanced discussion of a PG ethical dilemma; whether or not CYP2-D6 testing should be mandatory prior to the use of selective serotonin reuptake inhibitor (SSRI) antidepressants. The case of Michael Adams-Conroy, a poor CYP2-D6 metabolizer, who died at 9 years of age from high fluoxetine blood levels illustrated the issues. Results: Mean attitude overall was positive but became significantly less positive post-intervention (1.5 + .8 v. 1.8 + 1, p < .05). P-1 students in 2008 were significantly more positive pre-intervention than 2010 P1 students, but not post-intervention. Students were significantly less likely to obtain a genetic test to diagnose a serious disease after the intervention, but still more likely than if there was no treatment available or for a non-serious disease. Universities were most trusted to conduct genetic research, followed in order by charitable organizations, the federal government, and pharmaceutical companies. Implications: Presenting a balanced discussion of ethical dilemmas in the context of a compelling case can assist students in developing informed opinions.

Dean’s Advisory Council Hosts National Opinion Leaders in Panel Discussion on Professionalism in Pharmacy Practice. Richard J. Kasmer, Northeast Ohio Medical University, David D. Allen, Northeast Ohio Medical University. Objectives: The Northeastern Ohio Universities College of Pharmacy (NEOUCOP) Dean’s Advisory Council (DAC) utilized a facilitator to work with national, state and local opinion leaders to discuss their perspectives and visions on the issue of long-term strategic planning for a college of pharmacy. Method: A panel of opinion leaders from national organizations (ASHP, APhA and ACCP), state organizations (OPA and OSHP) and local hospital directors participated in an organized event whereby they could discuss the future vision of pharmacy practice. Results: The DAC members completed a pre- and post-meeting survey to assess the effectiveness of this approach. Results: A strategic plan was finalized that included a total of six (6) differential advantages. The major themes included the topics of long-term program sustainability, achieving enrollment goals, financial growth, enhancing interprofessional education and expansion of research initiatives. The results of the DAC member’s pre- and post-meeting surveys will be available for review. Implications: The Accreditation Council for Pharmacy Education standards and guidelines require colleges to create, implement, and regularly review a strategic plan in order to facilitate the advancement of its goals. NEOUCOP utilized a novel approach including its DAC and external resources to successfully complete this task.

Description and Evaluation of Entrepreneurial Leadership Internships for Student Pharmacists. Renae J. Chesnut, Drake University, Charles R. Phillips, Drake University, Raylene M. Rospond, Drake University, Denise A. Solis, Drake University, Nora L. Stelter, Drake University. Objectives: To describe and evaluate a national entrepreneurial leadership internship for student pharmacists. Internship objectives were: 1) Witness and develop entrepreneurial leadership 2) Prepare students for future entrepreneurial leadership positions 3) Provide exposure to and potential recruitment of emerging entrepreneurs Method: Administration and evaluation of the ten-week internship program will be described. Evaluation was based on survey data obtained from both interns and mentors, focusing on participant experiences, internship coordination, individual internship activities, and overall satisfaction. Results: Fourteen students completed internships at twelve sites. Sites were chosen, in part, based on innovative practices and included independent, regional chain, and national chain community pharmacies. In addition to typical internship duties, interns completed an online pharmacy management program series, Shaping Your Pharmacy Future. Students applied the information to their setting, participating in discussions and projects with their mentors and other staff. Interns attended state pharmacy association annual meetings and interacted with other pharmacists across the state. Conference calls with internship coordinators, interns, and mentors were also utilized for topic discussions. All interns
and mentors said that if they had it to do over again, they would participate. Also, 93% of the interns and 100% of mentors rated the experience as very good or excellent. Additional evaluation data for program outcomes will be presented. Implications: Creation of an entrepreneurial leadership internship was favorably evaluated by both interns and mentors. Internships such as this expose student pharmacists to innovative practitioners while allowing sites to develop and recruit emerging entrepreneurs.

Designing an Instrument for Measuring Motivational Interviewing Skills Acquisition in Healthcare Professional Trainees.

Tatjana Petrova, Auburn University; Jan Kavookjian, Auburn University; Michael B. Madson, University of Southern Mississippi; Sharon McDonough, Auburn University; John C. Dagley, Auburn University; David Shannon, Auburn University. Objectives: Motivational Interviewing (MI), as a communication skills set has a significant impact on addiction management, change in lifestyle, and adherence to treatment. Knowing that, proper training in MI and evaluation of the training is important. Method: The purpose of this research project was to develop a valid, reliable, brief, and effective assessment tool for assessing mastery of MI skills in health care provider trainees attending training in MI. To address this purpose, specific steps were followed: developing conceptual and operational definitions; selecting a scaling technique; selecting a response format and developing directions for responding; preparing drafts of the instrument and conducting a review of items; analyzing reliability; and preparing a manual and examples of MI adherent and non-adherent behaviors. The Motivational Interviewing Skills for Health Care Encounters (MISHCE) was developed. Results: The validity and reliability of the MISHCE were established. Face and content validity were assured with well defined conceptual and operational definitions and a feedback from the expert panel. Reliability was established through internal consistency, inter-rater reliability, and test-retest reliability. The Cronbach’s alpha value indicated acceptable internal consistency for the MISHCE. The MISHCE demonstrated good inter-rater reliability and good to excellent test-retest reliability. Implications: The MISHCE is shorter, less time consuming and more practical for use than the existing instruments. The MISHCE is assessing the health provider’s level of knowledge and skills in brief disease management encounters. The MISHCE also evaluates one element of the quality of the patient-provider therapeutic alliance-the “flow” of the interaction.

Developing a Student-led Multidisciplinary Health Promotion Program for an Underserved Population with Diabetes.

Olayinka O. Shiyanbola, South Dakota State University; James Clem, South Dakota State University; Karly A. Hegge, South Dakota State University; Becky Randall, South Dakota State University; Cristina Lammers, South Dakota State University; Amy Richards, University of South Dakota; Marti Pollard, University of South Dakota; Ann Brunick, University of South Dakota. Objectives: Develop a student-led multidisciplinary diabetes health promotion program for an underserved population and determine if students’ knowledge and understanding of diabetes management improved. Method: Sixty three students from five health career disciplines (Pharmacy, Medicine, Nursing, Dental Hygiene and Nutrition) led six diabetes educational sessions designed to demonstrate critical components of diabetes management for patients. The longitudinal program covered topics within a new educational model called the Alphabet Strategy. Two clinics that serve the medically underserved were used as the practice sites. Students were surveyed at the beginning and conclusion of the project to determine their perception of the program, understanding of diabetes care and management, and awareness of the role of the different healthcare disciplines in diabetes management. Descriptive statistics and paired sample t-tests were done. Results: The mean age of student participants was 26 years (SD=5.38). Seventy five percent of the students agreed that they had an excellent understanding of the health promotion program and 91.5% agreed that they received adequate supervision during the program. There were significant improvements in students’ understanding of the role of different healthcare professionals (t=3.939, p=0.00), diabetes care knowledge (t =2.318, p=0.03), comfort working with an underserved population (t=2.628, p=0.016), ability to work in a healthcare team (t=2.956, p=0.005), ability to use the alphabet strategy (t=3.46, p=0.001), and ability to educate patients about meeting their goals and changing their behaviors. Implications: A successful multidisciplinary student-led health promotion program for an underserved population was implemented. Significant improvements were observed in the students’ understanding of diabetes care and management.

Differences in Admission Predictors of Deceleration within Pharmacy School: 1-5 vs 0-6.

Karen L. Hardinger-Braun, University of Missouri-Kansas City; Stephanie Schauer, University of Missouri-Kansas City; Wayne M. Brown, University of Missouri-Kansas City; Maqual R. Graham, University of Missouri-Kansas City; Shelly M. Janasz, University of Missouri-Kansas City; Linda S. Garavalia, University of Missouri-Kansas City. Objectives: The implementation of a centralized, electronic pharmacy school application service prompted a review of the relevant literature and an evaluation of current admissions procedures for the school’s traditional (1-5) and provisional (0-6) students. The purpose of the evaluation was to identify admissions variables associated with deceleration for academic reasons. Method: A retrospective review of students accepted at University of Missouri -Kansas City School of Pharmacy from 2000-2009 was conducted (n= 1,019). The students included traditional students (1-5, n=817) and provisional students (admitted directly from high school, 0-6, n=202). Factors analyzed included PCAT scores, pre-pharmacy course hours, GPA, pre-pharmacy science/math hours and GPA, leadership, writing ability and interview. Additionally, ACT scores, high school GPA, and science/math units were examined in provisional students. Results: Fifty-nine students (5.8%) left the program for academic reasons. Graduation was delayed in 31 students (3%). Most students decelerated for academic reasons during the first professional year (n=45, 38%). PCAT, interview, pre-pharmacy GPA, and pre-pharmacy science/math hours, were associated with not completing the program for academic reasons. However, composite ACT score did not predict deceleration for provisional students. Implications: Predictors of academic deceleration may vary for professional degree programs depending upon students’ entry point into the program (e.g. immediately post high school, 1-2 years of college, etc.). However, GPA for prior coursework, college or high school, may be a consistent predictor across entry points into the program.

Effect of a Common Read Program on Pre-Pharmacy Students’ Views and Educational Experiences.

Daniel J. Hansen, South Dakota State University; Jane R. Mort, South Dakota State University; Timothy Nichols, South Dakota State University, Jo Ann Sckerl, South Dakota State University. Objectives: Examine the impact of a common read program on pre-pharmacy student’s perception of public health issues, desire to serve others, academic challenge, and educational interactions. Method: In 2009 89 pre-pharmacy students
Examining Reflective Efforts on Career Goals in Pharmacy Students’ E-Portfolios. Rochelle M. Roberts, The University of Texas at Austin, Diane B. Ginsburg, The University of Texas at Austin, Christina Cestone, The University of Texas at Austin. Objectives: This poster will present students’ depth of reflection on essays about their career goals and the amount of effort they put forth into preparing the essays. Method: Participants were 131 P1 students during Fall, 2009, and 110 P1 students during Fall, 2010. The e-portfolio essays on career goals for both groups of students were evaluated for depth of reflection using a modified Ward & McCotter (2004) Reflection Rubric, organized into three dimensions, Focus, Inquiry and Change across four qualitative levels, Routine, Technical, Dialogic, and Transformative. The students during Fall, 2010, were also asked to complete an effort questionnaire related to writing their reflective essay, including their use of time, resources, and revisions. Results: The ratings of the essays from both groups primarily fell under the Dialogic level of reflection. All but three essays were at least at a Technical level, but the t-test result did not show a significant difference between the two groups on overall reflection (p = 0.36). Data from the effort questionnaires revealed that on average, students spent 109 minutes working on their essays and consulted 1 resource during preparation. The vast majority (94%) of students elected to revise their essay before submitting a final draft. Implications: These initial findings have prompted another phase of this study, to potentially identify a relationship between students’ amount of effort and ability to reflect. The goal will be to continue contributing to this line of research, ultimately to encourage future pharmacists to become more reflective in their practice.

Expanding Student Pharmacists’ Awareness of Breastfeeding as a Vital Health Behavior. Roger A. Edwards, Northeastern University. Objectives: Health care professional support of breastfeeding has profound effects on breastfeeding outcomes. With their knowledge of medication safety, visible roles in the community, and frequent interactions with new parents, pharmacists are in key positions to expand their role in promoting and supporting this important health behavior. Our objective was to improve student pharmacists’ breastfeeding knowledge and to shift students’ attitudes regarding their roles in infant feeding. Method: A 15-minute online tutorial based on the US Breastfeeding Committee recommendations for minimum breastfeeding knowledge for health professionals informed students of the: (1) benefits of breastfeeding; (2) American Academy of Pediatrics breastfeeding guidelines; and (3) contraindications for breastfeeding. We pilot-tested the tutorial at three schools of pharmacy and collected information on attitudes about infant feeding. Results: Results from 142 students (mean age = 22.7 years, 55% female) indicated that most students strongly agreed/agreed with the statements “I have an important role in providing advice about meeting the nutritional needs of infants” (84%), and “I have an important role in supporting parents’ infant feeding choices” (78%). Ninety percent were comfortable answering questions about breastfeeding vs. infant formula feeding. Fewer students were confident in answering questions about breastfeeding techniques/challenges (44% extremely/very confident and 45% moderately confident) and introducing solid foods (36% extremely/very confident and 45% moderately confident). Implications: Since people look to health professionals for guidance about health-related behaviors, shifting student pharmacists’ attitudes and knowledge is important for improving breastfeeding support. Ongoing work is focused on improving the tutorial and designing a national study.

Factors Influencing Pharmaceutical Sciences Graduate Program Choice in the United States. Tushar B. Padwal, The University of Mississippi, David J. McCaffrey, The University of Mississippi, Erin Holmes, The University of Mississippi, Amit Patel, The University of Mississippi. Objectives: The objectives of study were to: 1) identify factors considered important by pharmaceutical sciences graduate students during the application and acceptance phases of the admission process and 2) identify differences in the evaluative criteria for the two admission phases and for international and domestic students. Method: Focus groups and depth interviews were conducted exploring issues surrounding application and selection decisions of
Identifying Predictors of Success and Failure in a PharmD Program. Alicia N. Ayodele, University of Minnesota; Doneka R. Scott, University of Minnesota, Peter M. Haeg, University of Minnesota. Objectives: To identify pre-pharmacy performance measures that can help predict academic success and failure in the PharmD program at the University of Minnesota. Success was defined first as cumulative pharmacy GPA, then as probationary status. Method: We compiled pre-pharmacy performance data of all 322 admitted applicants from the class of 2006 and 2007. We compared pre-pharmacy performance data of academically successful and unsuccessful students in the PharmD program, comparing the top and bottom 10% of the class and also comparing students on who failed a course or who were placed on probation versus those who were not. Independent variables included pre-pharmacy science and overall GPA, PCAT scores, taking advanced biology, biochemistry and/or physiology, and obtaining Bachelor’s degree. Two regression analyses were conducted. Results: The first analysis revealed mean differences between the top and bottom 10% on Pre-pharmacy GPA, Science Pre-pharmacy GPA and Biology composite score. After backward elimination, only Pre-pharmacy GPA remained significant in the regression analysis. The stepwise logistic regression procedure for the probationary analysis yielded two competing models: 1. Pre-pharmacy GPA and PCAT Quantitative subscore (p = .0025) and 2. Pre-pharmacy GPA and PCAT Chemistry subscore (p = .0030). Further analysis revealed that Model 1 is slightly more predictive. Implications: The results of this study suggest that 4 of 5 EPIQ modules be added to our PharmD program as part of a required course. EPIQ was delivered to P3 students (N=63) and P2 students (N=73) in 2009-2010. EPIQ includes a student survey to assess student perceptions of learning at the end of the program. This survey was used to collect data about perceived learning outcomes. Descriptive statistics were used to present results. Results: Students reported better quality improvement skills and knowledge on a variety of survey items, but rated as “fair” to “good” their ability and motivation to pursue quality improvement. Use of The Healthcare Quality Book was associated with better student ratings of the expected usefulness of EPIQ training in pharmacy practice. Implications: In addition to EPIQ’s post-course student survey, instructors may wish to collect baseline student perceptions of knowledge, attitudes and abilities. Similarly, the EPIQ assessment may benefit from the addition of embedded assessment using student outcomes beyond perceptions.

MBA in Pharmaceutical Marketing and Management: A Pharmacy and Graduate Business School Collaboration Model. Fadi M. Alkhateeb, University of Charleston, David A. Latif, University of Charleston, Jennifer M. Snell, University of Charleston. Objectives: Although many schools now offer dual PharmD/MBA or MBA standalone programs, very few offer on that specializes in Pharmaceutical Marketing and Management. The objectives of this exploratory study were to (1) review the available literature on Pharmacy school MBA programs, and (2) to investigate pharmacists’ perceptions and expectations about the value of pursuing the MBA degree (i.e., focus, type, and program delivery method). Method: For the first objective, articles were identified via searches of PubMed and IPA from its inception to November 2010 related to MBA programs for pharmacists. Programs at seven colleges/universities in the United States were examined and compared regarding curriculum, duration/flexibility, pharmacy-related coursework, and hands-on training. For the second objective, pharmacist perception of MBA programs was evaluated through an online survey of a sample of 150 pharmacists who are clinical preceptors for pharmacy students at the University Of Charleston School Of Pharmacy. Results: Of the 150 mailed surveys, 30 were returned as undeliverable. A total of 57 responses were received giving a response rate of 47.5%. Of the 57 surveys received, 19 (33.3%) reported that they contemplated pursuing an MBA in the near future Implications: Most pharmacists preferred MBA programs related to healthcare or pharmacy (66%) over general MBA programs (33%). The majority of the respondents expressed an interest in the online, evening and weekend MBA programs. Pharmacists also expressed an interest in MBA programs that focus on management and finance courses, and to a lesser extent marketing and pharmacoeconomics.

Motivational Interviewing Skills Assessment: Comparison of Instructor, Student Self-Evaluation, and OSCE Patient Evaluation. Jan Kavookjian, Auburn University, Tatjana Petrova, Auburn University, Erika L. Kleppinger, Auburn University, Seth Hill, Auburn University, Michael B. Madson, University of Southern Mississippi. Objectives: The Harrison School of Pharmacy espouses a series of core competencies; Motivational Interviewing (MI), an evidence-based communication strategy set, is one of these. MI is taught in a required P1 course. Assessment of skills learning is a critical component for core competencies; the purpose of this project was to examine 3 dimensions of MI skills assessment: expert, patient, and student self-assessment. Method: After 14 hours of content immersion and 8 hours of skills lab practice, students were tested in MI skills via OSCE with a standardized patient (SP). Experts in MI rated the students using the Motivational Interviewing Skills in Health Care.
Encounters (MISHCE) instrument; SPs evaluated student MI skills using the patient version of the Client Evaluation of MI (CEMI) instrument; students self-evaluated using a self version of the CEMI. Responses on corresponding items were correlated (Pearson r); descriptive statistics were generated and examined for statistical differences across student characteristics. Results: Findings across MI domains per instrument were mixed. MI domains associated significantly with overall MI OSCE grade included expressing empathy, change talk, resisting the righting reflex, using reflective listening. Congruence between expert MISHCE and SP CEMI occurred on supporting self-efficacy and using open-ended questions; SPs who felt the student supported self efficacy also felt more hopeful and confident that they could make behavior change. Student and expert evaluations correlated inversely on several MI skills. Implications: The results suggest some variables in the 3-dimensional measures of MI skills acquisition were significantly associated and congruent, others were not.

Opinions of Appalachian College of Pharmacy Students Towards Active Learning in the Didactic Curriculum. Paul Gavaza, Appalachian College of Pharmacy, Jennifer A. Campbell, Appalachian College of Pharmacy, Craig R. Mullins, Appalachian College of Pharmacy. Objectives: Active learning (AL) is an important method of instruction in college education. However, little is known about students’ perceptions and opinions towards AL. The study investigated the opinions and perceptions of Appalachian College of Pharmacy (ACP) Doctor of Pharmacy students towards AL. Method: Data were collected from current ACP students (years 1 and 2) using a 2-paged self administered questionnaire. Students rated their opinions on a 5-point bipolar scale ranging from 1 (strongly disagree) to 5 (strongly agree). Results: Out of 141, 103 (73%) students completed the survey. Most students were female (52.1%, n=71) with an average age of 26.72±5.12 years. An estimated 20% of class time was devoted to AL. Based on a scale of 1 to 10, with 10 indicating highest quality, the mean quality score for AL was 5.69±1.93, with 26% of students rating AL quality as being poor (less than 5). Most students held favorable opinions on AL: AL was worthwhile/important (mean=3.41±1.03), not a waste of time (mean=3.23±1.15), and helped them to prepare for exams (mean=3.41±1.06). However, students thought that AL did not help them to become self-directed learners (mean=2.74±1.06), and that AL was not more effective than lecture intensive didactic learning (mean=2.77±0.97). Students were neutral on three other items. Implications: ACP students have favorable opinions concerning AL in general but were largely neutral and negative on AL at ACP. There is significant room to improve the potential contribution and quality of AL to students’ learning in the didactic curriculum at ACP.

Pharmacy Students’ Perceptions of the Benefit of Active Learning in a Health Care Systems Course. Judith T. Barr, Northeastern University, Jennifer McIntosh, Northeastern University. Nicole Hartnell, Northeastern University. Objectives: To determine if participation in active learning changes student perceptions of the benefit of these approaches in their learning process. Method: Students (n=133) in a required P1, 3SH Health Care Systems (HCS) course were asked to anonymously complete a pre-course survey 1) to inventory their exposure to various teaching/learning methods in high and college and 2) to assess their perception of the benefit of each approach. 73% of HCS sessions incorporated student response systems (clickers); 46% of the sessions included small group discussions based on pre-class readings and podcasts and classroom presentations. Post-class surveys repeated the perception-of-benefit items. Institutional Review Board approved this study. Results: Students reported that in high school the teaching method with the highest rate of “Significant Exposure” (SE=65.7%) was “do in-class group work”; that dropped to 8.8% in college. In college, the highest rate of SE was “listen to in-class lecture with PowerPoint” (86.9%). In HCS, students’ pre- versus post-perception of “High” and “Moderate” benefit of “small group discussions to apply content to new situations” rose from 64.2% to 72.2% (p=0.22), “do in-class group work” from 57.7% to 74.4% (p=0.012), and “use clickers to answer in-class questions” from 28.4% to 52.6% (p=0.005). “High benefit” of “in-class lecture with PowerPoint” fell (75.9% to 58.6%, p=.009). Implications: Student pharmacists had significant exposure to active learning activities in high school; however, in college, the primary modality changes to passive learning. However, when enrolled in a course that emphasized active learning, their perceptions of the benefit of active learning increased over the semester.

Potential Life-Threatening Events in Schools: Rescue Inhalers, Epinephrine Pens, and Glucagon Delivery Devices. Katherine Allen, Midwestern University’s Chicago College of Pharmacy, Kimberly Henselman, Midwestern University’s Chicago College of Pharmacy, Brian Laird, Midwestern University’s Chicago College of Pharmacy, Ana C. Quinones-Boex, Midwestern University’s Chicago College of Pharmacy, Thomas J. Reutzel, Midwestern University’s Chicago College of Pharmacy. Objectives: To determine the knowledge, opinions, practices, and experiences of school nurses in managing emergencies involving asthma, anaphylaxis, diabetes and related devices. Method: Emails with a link to SurveyMonkey® were sent to all U.S. members of the National Association of School Nurses (n=13,580). The survey assessed subject knowledge of the three disease states and devices; their estimates of how widespread related life-threatening events are; the practices actually used by these nurses to minimize such problems; and their viewpoints regarding how serious these issues are. Results: The response rate from the email blast was approximately 15% (2040/13,580). Respondents were confident and knowledgeable in regard to these matters. They were considerably less confident in the ability of non-nurses to handle such situations. When asked how many of their students carry these devices, subjects reported medians of 30 (rescue inhalers), 5 (Epipens®), and 1 (glucagon). Regarding the frequency of emergencies, the medians were 8 (asthma), 0 (anaphylaxis), and 10 (hypoglycemia). Respondents reported calling 9-1-1 an average of 1.3 times (asthma), 54 times (anaphylaxis), and .26 times (hypoglycemia) per year. They reported that events like these resulted in death 22 (asthma), five (anaphylaxis), and one (hypoglycemia) times. Implications: These diseases and devices create substantial potential for serious health crises in schools, and these nurses appear to be well-equipped to handle such crises. Still, pharmacists are accessible providers, able to serve as a resource for schools when it comes to managing these disease states and medications.

Prescribing Patterns and Treatment Cost for Non-Malignant Chronic Pain: Evidence from US Outpatient Settings 2000-2007. Rafia S. Rasu, University of Missouri-Kansas City, Kenngkham Vouthy, University of Missouri-Kansas City, Bithia Fikru, University of Missouri-Kansas City, Walter Agbor-Bawa, University of Missouri-Kansas City, Nahid Rianon, University of Texas Houston Medical School, Maureen Knell, University of Missouri-Kansas City. Objectives: Under-treatment remains a concern for non-malignant chronic pain, a major public health problem in the USA. Estimating financial burden using current prescription pattern is important to determine need for revisiting appropriate use of guidelines for improving chronic pain management. Method: This cross-sectional
study estimated pain medication expenses based on current prescription pattern by analyzing the US National Ambulatory Medical Care Survey (NAMCS) data from 2002-2007 on patients ≥18 years with common non-malignant chronic pain (diagnoses by ICD-9-CM codes identified as visit reasons). Prescribed medications were retrieved using NAMCS drug codes. Weighted frequencies were obtained using NAMCS weight parameters. Average drug prices were obtained from Red Book 2009 using average prices for different drug manufacturers for the most common packaged quantity sold. Results: Approximately 69 million weighted outpatient visits were reported for non-malignant chronic pain between 2000-2007. Almost all visits (99%) reported a pharmacotherapy prescription. Most visits (95%) prescribed NSAIDs costing $6.4 billion per year for NSAIDs alone. Lidocaine patches ranked second in cost (16%) contribution. NSAIDs, Opioids, and adjuvant therapy accounted for 35%, 12% and 53% of the total costs, in order. Total cost of prescribed drugs was $147 billion ($18 billion annually). Implications: Treatment cost for chronic non-malignant pain adds a huge burden to the US health care expenses. Discrepancy between NSAIDs, Opioids and adjuvant therapies in our results indicates studying prescribing patterns in following US guidelines for chronic pain management. Educating pharmacists on guidelines may help maximizing appropriate prescription use for effective chronic pain management.

Representing Ourselves: Analyzing Mission Statements of U.S. Colleges/Schools of Pharmacy. Suntaree Watcharadamonngkon, University of Wisconsin-Madison, Jeannine K. Mount, University of Wisconsin-Madison. Objectives: Describe components of mission statements of U.S. colleges and schools of pharmacy (C/SOPs) Analyze relationships between mission statement content and selected characteristics of C/SOPs. Explore implications of mission statements for performance of U.S. C/SOPs. Method: Cross-sectional, descriptive study of accredited colleges and schools of pharmacy in the U.S. A list of 112 C/SOPs was acquired from the AACP website in January 2011. Mission statements were gathered from C/SOP websites during February 2011 and content analyzed. Elements were identified using Pearce and David’s typology (1987). Other selected C/SOP characteristics were gathered from the AACP and Association of Academic Health Centers (AAHC) websites. Results: Mission statements of 110 C/SOPs were analyzed. Of these, 41 are members of the Association of Academic Health Centers (AAHC) and 60 are public institutions. Mission statements vary considerably in form and content. Applying a standard framework shows that statements generally lack comprehensiveness (range: 2 to 8 components). Three C/SOPs address all eight mission components, 24 address 6 or 7 components, 63 address 4 or 5 components, and 20 address fewer than 4 components. All addressed commitment to survival, growth, and profitability; only nine addressed use of technology. Content varied according to ownership and academic health center membership. Implications: Standards 2007 requires each C/SOP to develop mission statement (Standard 1) and a plan to evaluate mission achievement (Standard 3), playing a critical role in accountability, assessment, and accreditation processes. Further information is needed regarding development and use of mission statements by C/SOPs and effects this has on C/SOP performance.

Standardizing a Holistic Admissions Process to Evaluate Applicants for Admissions. Nazach Rodriguez-Snapp, University of South Florida, Heather M.W. Petrelli, University of South Florida, Dawn Schocken, University of South Florida. Objectives: The purpose of this poster is to share the development and utilization of a holistic admissions application rubric and the multiple mini-interview (MMI) to standardize evaluation of applicants’ cognitive and non-cognitive characteristics. Method: Applications were prescreened utilizing a rubric, which assessed cognitive and non-cognitive characteristics. Prescreened applications were ranked by pre-interview score and brought before the admissions committee. Selected applicants were invited to participate in the MMI. This interview method consisted of seven ‘stations.’ Six of the seven stations asked interviewees to answer a question that was meant to assess one non-cognitive characteristic (i.e. cultural awareness) at a time. The seventh station was an open station whereby applicants could ask questions or share additional information. Emotional maturity and communication were assessed at all stations. Each station had a two-minute prep, five-minute MMI encounter, and a three-minute post encounter scoring whereby interviewers scored each applicant using a standardized rubric. Results: An MMI aggregate score for each interviewee was calculated and added to prospective students’ pre-interview score, ranked globally and presented to the admissions committee for final admissions decisions. Implications: The standardization of the holistic admissions process allows for the consistent and fair assessment of applicant’s cognitive and non-cognitive characteristics. This process aids the admissions committee in making consistent admissions decisions. Future efforts will focus on evaluating any relationships between our scoring process and successful academic performance.

Student Pharmacist Opinions of Internationalization at Northeastern University’s School of Pharmacy. Joao L. Carapinha, Northeastern University, Judith T. Barr, Northeastern University, John R. Reynolds, Northeastern University. Objectives: Internationalization is the process of integrating an international and intercultural dimension into teaching and learning. With it comes great opportunities and challenges. The purpose of this research was to gauge the opinion of student pharmacists about readiness for and processes of internationalization that may lead to changes in the curriculum. Method: Previous work by higher-education associations was used to develop a questionnaire that was piloted and modified before distribution to all student pharmacists (n=836). SurveyMonkey was used to collect data and SPSS version 16 and Microsoft Excel 2007 were used for data analysis. The project was approved by Northeastern University’s Institutional Review Board. Results: Fifty-three percent (n=456) of students completed the questionnaire. Of the respondents, most (89.4%) have travelled outside the United States but very few (2.7%) have participated in an international cooperative education experience, study abroad programs (3.9%), or educational programs (11.1%) outside the United States. Most respondents (77.4%) believe that internationalization will increase their international knowledge and intercultural understanding but most (83.2%) fear that it will increase tuition of education programs and many (53.7%) believe it will reduce a domestic focus in the pharmacy curriculum. Most respondents (76.6%) would participate in a range of international experiences if offered in the PharmD program. Of these, 52.8% preferred such experiences in Western Europe, 14% in Asia Pacific, and 13.7% in Australasia. Implications: A better understanding of student opinions of internationalization will enable the School of Pharmacy to increase its international profile and reputation and offer students various international teaching and learning experiences.
support group identity on the setting and achievement of lifestyle (i.e., diet, exercise, SMBG) and medication-taking goals in persons with type 2 diabetes. **Method:** Adult patients were recruited via Zoomerang® (n=253) and various online peer support groups (n=133) to complete an online survey. Factor and reliability analysis were used to validate the survey. Data were analyzed using descriptive statistics, structural equation modeling (SEM) and moderated mediation regression analysis. **Results:** Subjects in support groups were more likely to be newly diagnosed (t=2.77, p=0.006), have HbA1c ≤7.0 (t=5.15, p<0.001), and not take insulin (x²=6.62, p=0.04). SEM demonstrated that social identity significantly influenced lifestyle goal setting for subjects in support groups (β=0.21). Lifestyle goal self-efficacy mediated the relationship between goal setting and achievement for both study populations (β=0.55, 0.66). There was an inverse relationship between illness identity and lifestyle goal self-efficacy for both groups as well (β=-0.33, -0.43). Regression found significant interaction between support group identity and medication goal self-efficacy on goal achievement (t=-1.9, p=0.05) in subjects in support groups. Bootstrap estimates for confidence intervals around the mean (2.46) were -0.135 to -0.649 and Sobel test = 2.4799 (SE=0.2909, p=0.01) reveal significant indirect effects. Setting medication goals significantly predicted medication goal achievement (t=5.10 p<0.001). **Implications:** These findings have implications for the assessment of illness and social identity in the provision of healthcare services and the use of support groups in the goal setting process for self-management of type 2 diabetes.

### Teaching Student Pharmacists to Develop an Evidence-Based Public Health Program to Impact a Vulnerable Population.

**Margarita V. DiVall,** Northeastern University, Craig Stevens, Northeastern University, Elina Zilberman, Northeastern University, Roger Edwards, Northeastern University, Jennifer Kirwin, Northeastern University, Mark D. Watanabe, Northeastern University. **Objectives:** To reinforce knowledge of population and public health principles and increase confidence and competency when designing an outreach program. **Method:** In a pharmacotherapeutics seminar, students designed a feasible health outreach program to address an assigned health issue, vulnerable population in a Boston-area neighborhood, taking into account population-specific cultural, economic and lifestyle factors. Students constructed patient pamphlets and delivered a professional presentations describing their program design, implementation strategies, and intended outcomes. Students completed a pre- and post-test to assess basic population health knowledge and their confidence when creating/implementing/evaluating a program. **Results:** Participation was >98% for both surveys. Students’ confidence in their ability to influence population health as a pharmacist significantly increased after this activity (agreement, pre vs. post): find and interpret epidemiological data as it pertains to population health (48% vs. 96%), create educational materials in language appropriate for patients (62% vs. 89%), and create a feasible public health outreach program on a selected health issue that takes into account patient specific cultural, economic, and lifestyle factors (35% to 84%). Additionally, students’ confidence in preparing a professional presentation improved (65% to 89%) as well as their ability to identify appropriate and measurable outcomes for program evaluation (54% to 93%)(p<0.001 for all comparisons based on a chi-square test). **Implications:** This activity improved student confidence associated with population health and increased their confidence when designing and evaluating an outreach program. The addition of this activity to the seminar demonstrated that student pharmacists’ knowledge and confidence in addressing public health needs can be substantially influenced.

### The Impact of Pre-Class Reading Assignments on Exam Grades.

**Chad Coulter,** Sullivan University, Sarah Smith, Sullivan University. **Objectives:** To assess the value of student preparedness for lectures by implementing pre-class readings (PCRs) and pre-class quizzes (PCQs) over the corresponding reading assignments. The second objective was to evaluate student satisfaction of these assessments via a class survey. **Method:** During the final two Therapeutics courses at Sullivan University College of Pharmacy, students were assigned 3-5 pages of reading material for each of the following day’s lecture topics. To assess completion of the reading assignments, a daily PCQ was given over the corresponding reading assignments. PCQ grades were averaged for each student and correlated with the student’s own mean exam grade using the Pearson’s correlation coefficient. An 8-item survey instrument was developed to evaluate students’ perception of PCRs and PCQs. **Results:** A strong positive correlation was found between student PCQs and exam grades (r=0.696; p<0.001). The results of the survey showed student satisfaction with the PCRs. **Implications:** PCRs and PCQs were beneficial to students in this Therapeutics course. A strong correlation was found between exam and quiz grades and student satisfaction with these assessments was moderately high.

### Theoretical Models

**Effecting Standards 2007: Knowledge Management as an Organizing Framework.** Suntharini Watcharadamrongkun, University of Wisconsin-Madison, Jeanine K. Mount, University of Wisconsin-Madison. **Objectives:** Success in creating, sharing and institutionalizing knowledge enhances an organization’s efficiency and productivity. This study: 1) proposes a model linking these knowledge management processes with organizational performance, 2) applies this model to studying colleges/schools of pharmacy (C/SOPs), and 3) explore use of KM processes in accreditation and accountability processes in C/SOPs. **Method:** Business and educational administration literatures identify knowledge management processes and discuss their relevance for organizational performance. Integrating these into a framework applicable to C/SOPs can provide guidance for C/SOPs regarding effective implementation of assessment and accreditation systems. Theories and models incorporated include: KM cycle model (King, Chung, & Haney, 2008), organizational learning process (Jerez-Gómez, Céspedes-Lorente, & Valle-Cabrera, 2005), Process of organizational learning (Slater, Narver, & Marketing Science Institute., 1994), and constructs related to processes of organizational learning (Huber, 1991). **Results:** This resulting model incorporates key constructs of KM processes and identifies relationships among these constructs, as applicable to C/SOPs. KM processes include three main constructs: knowledge acquisition (which covers knowledge creation, acquisition, refinement, and storage), knowledge integration (which emphasizes knowledge transfer and sharing), and institutionalization (which emphasizes processes of elaboration, infusion, and thoroughness). **Implications:** This organizing framework provides C/SOPs with a systematic way to address assessment and accreditation activities, as called for in Standards 2007. Colleges and schools of pharmacy can use this framework to conceptualize assessment and accreditation processes, to guide activities related to fulfilling accreditation requirements, and to diagnose problems related to these systems.

### Reducing the Generation Gap: Development of a Millennial Leadership Model.

**Heather M.W. Petrelli,** University of South Florida. **Objectives:** Historically, most research concerning the millennial generation surrounds teaching and education. Recent literature has begun to explore differences between work values of Millennials...
Comparison of emotional intelligence among different generations shows that pharmacists who utilize this strategy will be better equipped to deal with the needs of others and implement strategies to eliminate confusion/anxiety, promote harmonious relationships, and increase performance of employees. This poster will share the development of a leadership model specifically related to the Millennial generation. The goal is to help leaders or mentors identify the needs of their Millennial faculty or staff and alter their own behaviors, traits, or actions to meet those needs, while providing needed education.

**Method:** A comprehensive literature review was conducted to identify generational characteristics and the work values of the past four generations, with special emphasis on Millennials. Utilizing major themes presented throughout the literature, a model was developed of leadership strategies for Millennial faculty, staff, and students. **Results:** The Millennial leadership model draws on several leadership approaches to include Transformational Leadership, Shared Leadership, Path/Goal Theory, and E-Leadership. There are six leadership behaviors incorporated in the Millennial Leadership Model including provision of clear expectations, open and respectful communication, consistent feedback, flexibility, involved decision-making, and opportunities for growth. **Implications:** The changes from an industrial-based society to a knowledge-based society due to the Information Age has caused a shift from a bureaucratic to an interactive social character, which has major implications for leadership practice, enhanced productivity, and faculty retention.

**Student Perspectives of Writing for Health:** A Course Designed To Increase Emotional Intelligence. Donald R. Rickert, St. Louis College of Pharmacy, James R. Mensen, St. Louis College of Pharmacy, Ann M. Pounders, St. Louis College of Pharmacy, Kacy L. Wittler, St. Louis College of Pharmacy. **Objectives:** Writing for Health, a writing emphasis professional elective in St. Louis College of Pharmacy’s Pharm. D. curriculum, was first offered in the 2010 Spring Semester. The course objective is to increase students’ emotional intelligence by using a pedagogy that recognizes the positive therapeutic outcomes of writing. **Method:** The course requires students to engage in self-reflections by writing about relationships, illness, grief, and loss using three methods: in-class “free-writing,” semester-long journaling, and a fictional short story that is written as a final project. In developing their fictional story, students synthesize knowledge of emotional intelligence and personality type to achieve the story’s therapeutic outcomes. **Results:** The student co-authors mirrored the positive outcomes their peers achieved in the course. One reported, “As a ‘feeling personality type,’ I was able to immediately connect with the free-writing experiences and achieve deep self-reflections.” In contrast the second said, “I’m generally not an emotional person and in the beginning, I felt I didn’t really ‘connect,’ but eventually I was able to reveal and cope with emotions that I’d buried.” The third co-author agreed and said, “I found it interesting how the in-class writing assignments brought back significant memories.” **Implications:** Pharmacists must develop increased emotional intelligence if they are to provide effective care. The Writing for Health course provides one method for achieving this outcome. Pharmacists who utilize this strategy will be better equipped to deal with their own emotions and be sensitive to the emotions of their patients.

**Work in Progress**

**A Graduate Student Mentoring Program to Develop Undergraduate Student Interest in Research.** Mary E. Kiersma, **Purdue University**, Nicholas E. Hagemeier, Aleida M. Chen, Brittany L. Melton, Plake, **Purdue University**. **Objectives:** Mentoring has been considered a method for promoting professional growth of students through the use of role models, open discussion, and resources. The objectives of the study are to assess the impact of a graduate student mentoring program for undergraduate students on: 1) undergraduate student interest in research and post-graduate education and 2) graduate student confidence in mentoring. **Method:** Undergraduate students were recruited using class announcements in courses offered by the College of Pharmacy. Graduate students were recruited from all three departments, including the basic sciences and pharmacy practice. An informational meeting early in the semester introduced interested undergraduate students to program expectations, research departments, and graduate student mentors. Twenty-two graduate and 55 undergraduate students were matched according to research interests. During the semester-long pilot program, mentor/mentee pairs participated in a minimum of two structured discussions regarding research and pharmacy-related research careers. During the informational meeting, undergraduate students completed a 45-item pre-program assessment of their perceptions of research and mentors, as well as postgraduate training plans. Graduate students completed a 49-item pre-program assessment of their perceptions of mentors and their confidence in mentoring. At the end of the semester, a group meeting with graduate and undergraduate students will be held, and a post-program assessment will be administered utilizing the same instruments. **Results:** Results are pending. **Implications:** Implementing this program may increase undergraduate students’ understanding of research and develop interest in pursuing post-graduate education. Graduate students may improve mentoring skills, which will aid in future leadership roles and/or careers.

**A Survey of Grading Scale Variations in Doctor of Pharmacy Programs.** David M. Baker, **Western New England College**, Eric C. Nemec, **Western New England College**. **Objectives:** The objectives of this survey are to determine if there is a prevalent grading scale currently utilized in Doctor of Pharmacy programs throughout the United States and if so, what that most prevalent grading scale is. To our knowledge, this question has not been addressed for professional pharmacy education. In addition, the study will begin to explore different grading scales, academic freedom in grading, and the demographic breakdown of grading scales. The results could provide guidance for both established and new schools of pharmacy. Future directions of this survey will be to compare doctor of pharmacy program grading policies with other professional doctorate programs, as well as correlating grading scale type with student perceptions of success and postgraduate training placement. **Method:** An online survey tool was developed and distributed to the School of Pharmacies’ respective Dean of Academic Affairs via email to elicit responses. A second email request will be sent two weeks after a nonresponse. Follow-up telephone calls will be made two weeks after the second email to nonresponsive Schools. **Results:** Pending based on data collection. **Implications:** Pending based on survey results.

**A Technologically Enhanced (Wiki) Activity Series to Integrate Courses Across Curricular Departments.** Elizabeth A. Musil, **Concordia University Wisconsin**, Scott Hordesky, **Concordia University Wisconsin**. **Objectives:** 1. Integration of curricular course material across Pharmacy Practice (PP) and Social/Administrative Sciences departments (SAS). 2. Enhance student engagement in learning material by matching the learning style of the “technology generation” 3. Enhance learning experience related to cultural competency and health care entities via exercises utilizing Wiki technology to foster familiarity, consistency, and empathy. **Method:** A series of exercises...
was designed surrounding two first-semester P1 courses utilizing Wiki technology to guide activities and actively engage learners. The exercises started with learners creating virtual patients with diverse attributes. These “patients” were utilized to integrate multiple topics from each course, scripted across multiple weeks of lecture (SAS) and laboratory sessions (PP). At semester end, a survey was administered to assess the student’s perception of level of engagement, use of the WIKI, and degree of integration and knowledge retention obtained by this activity series. Results: Learners completed the series of exercises, demonstrated understanding and retention of course materials, and reported both positive and negative anecdotes. Over 70% of students identified positive learning and engagement from assignments, although only 24% agreed the technology matched their learning style, and only 35% would like to use it again. Implications: The use of a Wiki to enhance learning across courses, as well as for a single course, is promising as a teaching method. However, students did not embrace the technology as would be expected from this generation of learners.

**AACP Abstracts Reflect Interests of Membership- 2010.** Bernard A. Sorofman, *The University of Iowa. Objectives:* Abstracts reflect the interests of the membership. The purpose of this project was to analyze abstracts submitted to the AACP Annual meeting in 2010 to determine 1) what educational interests were represented and 2) how educational interests varied by the types of educational institutions (private v. public; newer v. established). **Method:** A content analysis of abstracts submitted to the 2010 AACP annual meeting was performed. An initial code book was constructed using recent issues of AJPE. New topics were added as they were identified. Each abstract was reviewed and labeled with 1 to 4 keywords that identified its topical focus. Keywords were arranged into thematic content areas and frequencies noted. Institution analysis was restricted to the academic institution of the first author. Schools were labeled as private or public and with their year of program initiation. Thematic contents were then arrayed by school type and year of program initiation. **Results:** This is a work in progress and will be completed prior to the July 2011 AACP meeting. Themes have been identified and schools categorized. Data is being analyzed will be presented on the July 2011 AACP meeting. **Implications:** The future AACP is in many ways linked to the scholarly efforts of its members. One must consider how to assure that the organization meets the interests of its members and establishes avenues that assure members can present and discuss educational issues related to their needs and interests.

**Advocacy Skill Development: The Maryland and VCU Experience.** Cynthia J. Boyle, *University of Maryland,* Gary R. Matzke, *Virginia Commonwealth University,* Robert S. Beardsley, *University of Maryland. Objectives:* Describe the processes utilized in an inter-institutional course to transform students to become lifelong advocates for optimal health care outcomes. **Method:** Over the past 5 years, Maryland and VCU faculty have partnered to teach political advocacy development and leadership to their P2 and P3 students. Students learn the five steps in the policy development process and how to be proactive during each step. Basic advocacy elements are discussed and students critique examples of written communications with legislators. The entire class makes U.S. Capitol Hill visits each fall. Authors will share solutions to the challenges of course delivery and how to engage students in health care issues. **Results:** Over 200 students have participated in the course. Congressional visits have increased each year from 12 in 2006 to 40 in 2010. Over 80 letters were sent to legislators in Fall 2010. Course graduates have expanded their local community advocacy commitment and several have participated in national organization advocacy programs. Two participants are slated as candidates for state pharmacy association president. **Implications:** The elements of advocacy are rarely a component of secondary education and almost non-existent in pre-pharmacy course content. Thus many PharmD students are deficient in basic knowledge of government affairs and the processes through which they can influence policymaking. The Argus Commission encouraged schools and colleges of pharmacy to implement leadership and advocacy development courses. The response to this inter-institutional course has been extremely favorable and represents a viable approach to preparing pharmacists to become more effective advocates.

**Assessment of Feedback Factors Affecting Pharmacy Student Patient Counseling Self-Efficacy.** Mary E. Kiersma, *Purdue University,* Kimberly S. Plake, *Purdue University,* Holly L. Mason, *Purdue University,* Gail D. Newton, *Purdue University,* Deborah E. Bennett, *Purdue University. Objectives:* Positive and constructive feedback can have varied effects on students’ self-efficacy and personal goal orientation toward learning. The objectives were to assess students’ self-efficacy relative to counseling skills based on: 1) type of feedback and the sequence received during a patient counseling session, 2) personal goal orientation, 3) personal goal orientation and the feedback sequence, and 4) demographic variables. **Method:** First and third professional year students (N = 299) participated in the study during a regularly scheduled patient counseling laboratory. A training session for evaluators and standardized patients was developed to promote consistent feedback and performance across students. Students were randomized to receive formative feedback by one of two sequences: positive then constructive or constructive then positive. A rubric was constructed to provide consistency among evaluators in patient counseling assessment. Prior to the patient counseling exercise, students completed a 43-item survey regarding personal goal orientation (e.g. mastery, performance), self-efficacy in counseling skills (e.g. verifying patient information, understandable wording), and demographics. A five-point Likert scale was used to assess personal goal orientation and patient counseling self-efficacy. A 46-item retrospective pretest/posttest allowed students to re-evaluate their confidence after completing the patient counseling exercise. **Results:** Results are pending. Descriptive statistics and analysis of variance will be performed to assess the influence of feedback and goal orientation on student pharmacist patient counseling self-efficacy. **Implications:** Results will provide information regarding the influence of feedback and goal orientation on student self-efficacy in patient counseling and provide a foundation to enhance the academic abilities of pharmacy students.

**Assessment of Pharmacy Manpower in West Virginia.** David A. Latif, *University of Charleston,* Fadi M. Alkhateeb, *University of Charleston,* Michelle R. Easton, *University of Charleston,* David G. Bowyer, *University of Charleston,* Michael B. Bottorff, *University of Charleston. Objectives:* The national shortage of pharmacists has been much publicized and has been identified as one of the reasons for new schools of pharmacy to open, or for existing colleges and schools of pharmacy to increase their class sizes. As additional colleges and universities in a region contemplate opening a school of pharmacy, it is prudent to examine the current data and corresponding perceptions from local pharmacists and employers that the pharmacy Aggregate Demand Index (ADI) does not collect/illustrate. Our objectives are to identify pharmacist staffing levels in West Virginia, identify specific
Assistant Professors’ Perceptions of Mentoring Relationships and Choice of Postgraduate and Career Paths: A National Study. Nicholas E. Hagemeier, Purdue University, Matthew M. Murawski, Purdue University, Steven R. Abel, Purdue University, Holly L. Mason, Purdue University, Helen R. Patrick, Purdue University, Nicholas G. Popovich, University of Illinois at Chicago. Objectives: 1) To determine the extent to which assistant professors’ perceptions regarding mentoring relationships experienced prior to postgraduate training (e.g., as student pharmacists or baccalaureate students) influenced their choice of postgraduate and career paths; and 2) To examine differences in perceptions regarding mentoring relationships experienced prior to postgraduate training across assistant professor demographic characteristics. Method: A survey instrument assessing perceptions of mentoring relationships and postgraduate education was developed. Likert-type, binary, and constructed response items were employed to gather assistant professors’ perceptions, demographic data, and data regarding the pharmacy experience and postgraduate training of mentors. A pilot study was conducted with Purdue University College of Pharmacy Assistant Professors. A census (N = approximately 2,600) of assistant professors at accredited U.S. schools/colleges of pharmacy is currently in progress. Results: A response rate of 76.2% was obtained from the pilot study. National data are currently being collected. Implications: Pharmacy literature has indicated a need to increase student pharmacist interest in pursuing postgraduate education and academic careers. Understanding the perspectives of individuals who pursued these paths, e.g., assistant professors, regarding mentoring relationships experienced prior to postgraduate training will enable pharmacy educators to better understand the dynamics of mentor/mentee relationships and the influence of these relationships on career decision making processes. This research will provide the academy with information that can be used to develop or revise mentor/mentee programs in an effort to effectively and efficiently promote postgraduate education and academic careers to student pharmacists.

Beyond Lectures: Management and Marketing using Team-Based Learning, Matthew Witry, The University of Iowa, Brandon J. Patterson, The University of Iowa, William R. Doucette, The University of Iowa, Elizabeth H. Chang, The University of Iowa. Objectives: Management and marketing are ACPE-required components of the PharmD curriculum emphasized in the CAPE outcomes. Management and marketing are essential skills for pharmacists given the changing demands of pharmacy practice. Pharmacy service delivery requires pharmacists to motivate employees, market new offerings, and allocate resources efficiently. Traditional lecture-based management courses have struggled to engage students in learning, especially with large class sizes. Team-based learning (TBL) is an alternative to traditional didactic approaches. TBL creates incentives for students to come to class prepared, engage in peer learning, and apply course concepts in solving meaningful problems. TBL has been shown effective in increasing cognitive and attitudinal aspects of learning in other settings. The aims of this educational experience were to integrate TBL into a management and marketing course and evaluate the effectiveness and feasibility of delivery. Method: This course meets twice weekly for fifty-minutes simultaneously in three classrooms. Three instructors and one teaching assistant coordinate course delivery to 112 students. Content is divided into seven, two-week modules, each containing two quiz days and two application days. The course utilizes student response devices, team whiteboards, and an online course management website. Student grades are determined by individual and team quizzes, team application exercises, exams, and peer evaluations. Results: Effectiveness will be measured as content mastery and satisfaction. Feasibility will be assessed qualitatively by the instructors. Implications: Sharing this experience could be useful to others looking to change how management and marketing are taught. This application of TBL also could be expanded to other pharmacy courses.

Comparing Student and Faculty Perceptions Regarding Factors Impacting the Choice of Academia as a Career Path. Mehgan Hassanzadah, Touro University California. Objectives: AACP has reported a national shortage of pharmacy faculty. The objective of this study is to describe and contrast pharmacy student and faculty opinions regarding factors that contribute to the shortage of qualified pharmacy faculty. Method: A survey to gauge pharmacy student and faculty perceptions (Likert type scale) regarding reasons for the shortage of pharmacy faculty was developed and pilot tested. Pharmacy students and faculty from all eight schools in California were invited to participate. Statistical comparisons were made using a Wilcoxon Rank Sum test for ordinal variables (Likert Scale items), Student’s T-Test for continuous variables (e.g., age), and a Chi-Square test for dichotomous measures. A total of 1043 student and 106 faculty surveys were deemed complete and included in the analyses. Results: Students reported “research and publishing” as number one with “lower salary” and “additional student loans/costs” ranking second and third, respectively when asked what factors inhibit you from pursuing a career in academia. Conversely, faculty reported “lower salary” as the primary reason for students not choosing an academic career path, with “additional student loans/costs” and “additional training” ranked as second and third, respectively. Both students and faculty felt that pharmacy faculty were not doing enough to adequately expose students to pharmacy academia career options. Implications: The lack of exposure to academic career options in pharmacy curriculum (agreed upon by both students and faculty) provides a unique opportunity for schools to better educate students regarding the opportunities and expectations of an academic career path.

Conceptualization and Preparation of a Guidance Document for Pre-Pharmacy Students Regarding Legal and Regulatory Considerations. Casey M. Combs, University of Kentucky, Joseph L. Fink, University of Kentucky. Objectives: Pre-pharmacy students have a number of concerns related to their aspirations to enroll in and complete the PharmD curriculum. Getting the correct pre-professional courses, meeting deadlines to apply to take the PCAT, completing appropriate applications for admission and financial aid - all can contribute to a list of details requiring attention. Add to that legal and regulatory considerations and the list becomes all the more daunting. Method: This report describes the conceptualization and
preparation of a document intended to be used by pre-pharmacy students to help them navigate the legal world of pharmacy when trying to prepare themselves for pharmacy school. Many students are interested in working as a technician to gain experience in or exposure to pharmacy practice prior to applying for admission. However, there are alternative approaches to go about gaining experience and the document described here will help pre-pharmacy students understand their options. Results: Issues addressed include how to gain experience prior to pharmacy school and the variety of ways and types of experience that can be obtained, explanation of the difference under the law between technical and professional tasks, when and how to apply for an intern registration with the Board of Pharmacy, and how to get a head start on the required internship hours prior to beginning pharmacy school classes. Implications: The goal of this document is to help pre-pharmacy students in Kentucky answer these questions and more along with providing information about resources necessary to navigate the legal world of pharmacy.

Cultural Differences in Leadership Styles of Pharmacist Preceptors. Catherine A. Harrington, Nova Southeastern University, Nile M. Khanfar, Nova Southeastern University, Holly H. Anderson, Nova Southeastern University, Hugh M. McLean, Nova Southeastern University. Objectives: The objective is to assess leadership styles of pharmacist preceptors from different cultures in South Florida. Leadership style is one’s preference to emphasize task versus relationship behavior when working within a group. Culture is defined broadly to include race, gender, generation, languages, and work environment, etc. The hypothesis is that leadership style varies among pharmacists from different cultures. Method: Leadership style will be measured using a validated, 20 question survey instrument developed by PG Northouse. Cultural data will be collected using 11 additional questions from the National Pharmacist Workforce survey along with 2 questions on work culture categories (e.g., Hierarchical) described by Bruce M. Tharp. The survey will be pilot tested on 20 pharmacist faculty, then deployed using electronic surveying to a 1,000 pharmacist preceptors of the College. Participants will get feedback on their own leadership style and comparison data on predominant styles of other cultures. Results: Results from the pilot survey will be collected and analyzed by April 2011. Preliminary data from the main survey will be available by July 2011. Implications: As the U.S. population diversifies, pharmacists must understand the role culture has in developing trust. Cultures help shape values, if one group highly values relationships and another task then conflict occurs. The goal is to better understand factors contributing to differences in leadership styles and reduce conflicts between preceptors and students. A leadership model that will help preceptors become more effective leaders of students will be developed from this work.

Designing an Electronic Student Portfolio: A Learning Tool that Transcends the Classroom Experience to Practice. Eric C. Nemec, Western New England College, Daniel R. Kennedy, Western New England College, Beth E. Welch, Western New England College, Joshua J. Spooner, Western New England College, Kathleen D. Wurm, Western New England College. Objectives: An electronic student portfolio has the potential to enhance teaching, learning, and assessment. It can serve as a teaching tool to help students make connections between classroom learning and its application in experiential practice. While most pharmacy programs have developed and implemented some measures of an electronic portfolio plan, few reports have described a design philosophy that connects classroom learning to experiential learning in a longitudinal fashion beginning with day one of the curriculum. The objective of this poster is to present the systematic process that was utilized to design an electronic portfolio system that would transcend the classroom to experiential education. Method: A multidisciplinary taskforce consisting of the Deans for Academic Affairs and Student Affairs, a member of both the Pharmacy Practice and Pharmaceutical and Administrative Sciences Departments, and the Director of Experiential Affairs was created. The makeup of the taskforce is inherent to creating a cohesive final product by ensuring that all disciplines which could utilize a portfolio have representation. The taskforce identified data throughout the curriculum that had utility for experiential learning and incorporated it into the overall design philosophy. Results: To be determined. Implications: The implication of this project is that it will assist other pharmacy programs as they work to develop and implement an electronic portfolio plan that creates a longitudinal experience for students that connects classroom learning to application.

Developing and Implementing an Interprofessional Course: Strengths and Challenges. Reza Karimi, Pacific University Oregon, Sandra Pelham-Foster, Occupational Therapy Pacific University, B.J. Scott, School of Professional Psychology. Objectives: An interprofessional course (IPC) was developed to provide basic guidance in developing knowledge, skills, attitudes, and values in order to function effectively in an interprofessional healthcare community. Method: 360 first year students from seven professional programs: dental health science, masters of healthcare administration, occupational therapy, physical therapy, physician assistant studies, school of pharmacy, and school of professional psychology, were enrolled in the IPC. In addition, thirteen faculty members from the above programs collaborated to deliver four didactic topics with associated interprofessional classroom experiences: teambuilding and communication, diversity, professionalism, and community resources. Prior to the 1st didactic topic, student teams were organized with 5-6 students per team. Pre and post surveys were implemented to evaluate the effectiveness of the IPC. Results: The survey results indicated that many students experienced the values and benefits of the offered IPC didactic curriculum. A comparison between pre- and post-delivery of each topic indicated that students improved their interprofessional knowledge and awareness of the above four topics. In addition, our results have identified challenges and weaknesses of implementing an IPC. Implications: The overall didactic results indicate that an interprofessional course is a meaningful curricular activity to be offered to students. Currently, the strengths and weaknesses are being considered in detail in order to support further development of the IPC so that it has the most impact for students in a variety of professions for developing interprofessional skills.

Development and Assessment of PharmD Admissions. Conrad Dhing, Husson University, Aaron Domina, Husson University, Roger Phipps, Husson University, Eric J. Jarvi, Husson University. Objectives: To develop and assess the PharmD admissions process at a new school of pharmacy. Method: Husson University School of Pharmacy developed a multi-step admissions process and admitted its inaugural class of PharmD students in 2009. After minor changes were made in the process between 2009 and 2010, the current version was used for candidates applying for the Fall 2011 admissions. Initial reviews of candidates included their PCAT scores and GPAs of prerequisite courses in chemistry, biology and mathematics. Based on these scores, selected candidates were invited to the school for a face-to-face interview with pharmacy faculty and students. While on campus, candidates were given a campus tour and orientation, followed by a group case-study evaluation and a time-writing essay based on...
the case-study. Each candidate then had a 30-minute interview with a pharmacy faculty and student. At the end of the interview, candidates were asked to complete an anonymous survey to elicit their opinions on the application and admissions process. Results: Based on preliminary data from 65 candidates who were interviewed starting in January 2011, at least 90% of the respondents found the admissions process to be positive on 9 of 11 categories. Fourteen percent (9/65) of the respondents felt the entire interview process was too long. Comprehensive results of all candidates interviewed through the end of March will be presented at the meeting. Implications: Accessing candidates’ responses to the admissions process allows the school to improve the clarity of expectations of the students during the interviews.

Development of a Process to Validate the Assessment of Doctor of Pharmacy Course Objectives. Spencer E. Harpe, Virginia Commonwealth University, Jeffrey C. Delafuente, Virginia Commonwealth University, Veronica P. Shuford, Virginia Commonwealth University, Brigitte L. Sicat, Virginia Commonwealth University, Jurgen Venitz, Virginia Commonwealth University. Objectives: The Accreditation Council for Pharmacy Education requires institutions to develop and implement policies and procedures to assess professional degree programs. Other than information from primary and secondary education, relatively little guidance exists for higher education. We will describe our institutional efforts to develop a standardized process to validate course assessment methods for measureable course objectives. Method: With the implementation of a new professional pharmacy curriculum, our revised assessment policies call for a formal review of each didactic course by the Outcomes and Assessment Committee at least once every four years. The procedures to implement these policies are currently being developed. It is important that these procedures provide information necessary to support useful programmatic assessment without creating an undue burden for course coordinators. Results: Coordinators from two required PharmD courses have agreed to participate in a pilot program to develop assessment validation procedures. These coordinators have been provided forms to collect information about assessment methods used for each course objective listed in their respective course syllabi. They have also been asked to define the relationship between course objectives and the PharmD curricular outcomes and to provide feedback regarding the estimated workload to provide the requested information, as well as any points in the process needing clarification. Implications: Regular, standardized programmatic assessment of courses is vital to maintaining a quality educational program. The results from this pilot will guide the development of review procedures that assure the validity, reliability, and relevance of assessment items and that curricular outcomes are being achieved.

Evaluating a Continuing Professional Development Experience in a Leadership Development Elective Course. Brandon J. Patterson, The University of Iowa. Matthew Witry, Elizabeth H. Chang, The University of Iowa, Oscar W. Garza, The University of Iowa, Cora Lynn B. Trewet, The University of Iowa, Donald E. Letendre, The University of Iowa. Objectives: To be effective leaders, pharmacists must evoke a cycle of continuing professional development. Successful organizations are led by individuals with strategically developed knowledge, skills and behaviors. Leadership skills and behaviors are integral for development of organizations providing pharmacy services. Continuing professional development (CPD) is a framework that allows individuals to coordinate learning experiences towards attainment of intentional educational goals. Linking leadership development with CPD within the pharmacy curriculum may lead to development of skills and motivations necessary to continue lifelong leadership development. The aims of this project are to integrate CPD elements into a leadership elective course and to evaluate student-assessed utility and instructor-assessed quality of the CPD experience. Method: Students will complete two CPD cycles as components of a semester-long elective leadership course. A CPD cycle worksheet will guide students through selection of areas of interest, reflection, planning, action, and evaluation CPD steps, as well as recording of learning activities. Results: A brief student questionnaire given at the end of the semester will assess the utility of the CPD worksheets from the students’ perspective. These assessments will include questions concerning perceived effectiveness, benefits, and hardship associated with the CPD worksheet use. Quality of CPD elements will be assessed using a rubric designed by course instructors. Implications: Other coursework and curricula may benefit from the introduction of CPD elements. Students exposed to CPD throughout the curricula may develop policy and practice changes supporting the use of CPD as a means to demonstrate continued professional competency and leadership development.

Evaluation Of Teaching Methodologies For Introduction To Pharmacy Practice Management. John R. Thompson, Lipscomb University, Kamala S. Nola, Lipscomb University, Ray E. Marcom, Lipscomb University, Crescent E. Rowell, Lipscomb University. Objectives: The objective of this study was to compare student pharmacist learning outcomes in pharmacy practice management associated with four different teaching methodologies: traditional lecture, prior reading with class discussion, team-based learning, and small group projects. Method: The course was divided into five distinct blocks of material and student pharmacists were assessed at the beginning and end of each block for their level of interest in the material and perceived level of difficulty to adjust for any bias based upon course content. Each class in each block was delivered by one of the first three teaching methodologies and exam questions were keyed to the style of teaching for subsequent evaluation and analysis. In three of the five content blocks, student pharmacists were asked to work in small groups on a project that integrated the course material. Student pharmacists were also evaluated on their knowledge and interest in pharmacy management before and at the conclusion of the course. Results: Generally, student pharmacists participating in the course increased their self-reported knowledge of pharmacy management, although their overall interest in the subject declined. By self-report, student pharmacists indicated that traditional lecture was the most effective teaching methodology employed in the course. An analysis of student pharmacist exam performance is underway to determine if one particular teaching methodology was more effective in examination performance. Implications: This could potentially identify a preferred teaching methodology for pharmacy practice management curricula.

Faculty Norms Regarding Social Media Use and “Friending” Behaviors. Jeff J. Cain, University of Kentucky, Doneka R. Scott, University of Minnesota, Anne H. Metzger, University of Cincinnati, Paige S. Akers, Lipscomb University, Amy M. Tiemeier, St. Louis College of Pharmacy. Objectives: 1) To determine extent of pharmacy faculty social media use 2) To determine pharmacy faculty opinions and attitudes toward e-professionalism 3) To determine pharmacy faculty “friending” behavior with students and peers 4) To determine pharmacy faculty use of social media for professional purposes 5) To determine pharmacy faculty use of social media for educational purposes Method: A questionnaire addressing the research objectives was developed, pilot-tested by members of the
sample, and administered via RedCAP (a secure online survey program) to faculty members at five accredited colleges of pharmacy. All collected data is anonymous and will be reported in aggregate fashion. Data analysis will consist of both quantitative and qualitative methods. Results: Data analysis will occur prior to the July AACP annual meeting. Implications: Results of this study will help guide pharmacy faculty on accepted use of social media for student communication, professional networking, and teaching.

Fostering an Inter-Professional Culture: Development of Shared Services Model for Interdisciplinary Delivery of Student Affairs Programming, Kevin B. Sneec, University of South Florida, Heather M.W. Petrelli, University of South Florida, Joann Strobbe, University of South Florida, Alicia Monroe, University of South Florida, William Quillen, University of South Florida, Rita D’aoust, University of South Florida, Jennifer Moyer, University of South Florida. Objectives: The University of South Florida (USF) is a nationally recognized research university and is designated by the Carnegie Foundation for the Advancement of Teaching as a research university that is community engaged. USF Health is comprised of the Colleges of Medicine, Nursing, Public Health, and Pharmacy; the Schools of Biomedical Sciences, and Physical Therapy and Rehabilitation Sciences; and the USF Physicians Group. USF Health is transforming the culture to establish outstanding inter-professional educational and clinical relationships. The purpose of this poster is to describe the process by which the Colleges and Schools within USF Health have collaborated to develop the delivery of a shared services student affairs model and provide results of a student perception survey regarding student services and organizational cultural factors. Method: Major internal stakeholders including the deans of each college/school, associate deans of student affairs, and the staff of business, finance, and student affairs developed a task force with three sub-committees charged with development of the organizational structure and governance, defining student services roles, and transparent funding methodology and facilities design. Results: The poster will present the results of the student perception survey and the outcomes of the task force and sub-committee work. Implications: The development of a shared student affairs services model will offer many potential benefits to USF Students and administration to provide improved quality and efficiency with consistent delivery of services; strategic benefits such as increasing inter-professional interaction, and opportunities for building a more cohesive community supporting education and clinical care.

Impact of Josie’s Story to Highlight Patient Perspectives in a Required Medication Safety Course. Jessica N. Wolf, University of Wisconsin-Madison, Jennifer E. Bryant, University of Wisconsin-Madison, Michelle A. Chui, University of Wisconsin-Madison, Robert M. Breslow, University of Wisconsin-Madison, Olufumilola Odukoya, University of Wisconsin-Madison. Objectives: This study will evaluate the impact of reading Josie’s Story, a true story about a mother’s journey after her daughter died of a medication error, has on students’ perceptions of medication safety and their intended behavior when interacting with patients. Method: Safety and Quality in the Medication Use System is a required course for Doctor of Pharmacy students at the University of Wisconsin (UW) School of Pharmacy. During the Spring 2011 academic semester, students were required to read Josie’s Story and attend an in-class discussion regarding the book. Following the in-class discussion, the survey, which employed a pre-post retrospective method and extracted items from the Caring Ability Inventory, was administered to measure change in students’ perceptions of patient care. Additional questions included students’ perceptions of the assignment, experiences with medication safety, and the importance of medication safety before and after reading Josie’s Story. Results: 120 out of 138 students (response rate = 87%) completed the survey. Overall, students reported that Josie’s Story made a significant impact on their role as a pharmacist and their perceptions of medication safety. Additional results will be presented at the AACP Annual Meeting. Implications: This course previously addressed topics such as work system problems and strategies to prevent medication errors. Successfully adding a component that introduces how a medication error impacts a patient and her family may help motivate students to recognize the importance and need for a culture of safety, and provide a venue for students to gain empathy and caring skills.

Impact of a Health Literacy Assignment on Student Pharmacist Learning. Aleida M. Chen, Purdue University, Marwa Noureldin, Purdue University, Kimberly S. Plake, Purdue University. Objectives: It is estimated that the average adult in the United States reads at the eighth grade level, while most health material is written at the tenth grade level or higher. Pharmacists are expected to communicate with patients utilizing easily understandable educational materials. Therefore, the objective of this project was to evaluate the impact of a health literacy assignment on student pharmacist: 1) learning, 2) ability to write health literacy level-appropriate patient education material, and 3) perceptions regarding use of these skills in future practice. Method: Third professional year student pharmacists were asked to rewrite a patient medication information sheet at the fifth grade reading level, altering it from the twelfth grade level. After completing the assignment, students completed a written reflection on the experience, including what they learned, what information was difficult to rewrite, how they accomplished the assignment without compromising accuracy, and their perception of the impact this assignment had on their future practice. Content analysis of the reflections will be performed to identify themes grounded in the students’ responses. Results: Reflections were completed in 2009 (n = 160) and 2010 (n = 145), for a total of 305 completed reflections. Analyses are pending and will be completed by the time of the meeting. Implications: Through this activity, student pharmacists may learn how to effectively communicate with patients, regardless of health literacy level. They may appreciate the difficulties in writing clear patient education materials and develop strategies to overcome these difficulties and provide effective patient communication.

Impact of a Required Interprofessional Education Activity on Attitudes Toward Working in Healthcare Teams. Patricia R. Freeman, University of Kentucky, Donna Weber, University of Kentucky College of Medicine, Megan Song, University of Kentucky, Aaron Morgenstein, University of Kentucky, Yevgeniya Gokun, University of Kentucky, Mikael D. Jones, University of Kentucky. Objectives: A mandatory small group, interprofessional experience (IPE) was developed for all year 2 medical (M2) and year 3 pharmacy (P3) students. One of the key goals is to develop skills and attitudes essential for effective health care team dynamics. The purpose of this research is to 1) identify baseline attitudes of M2 and P3 students toward working in healthcare teams and 2) to assess the impact of the required IPE on M2 and P3 attitudes. Method: Prior to the onset of the IPE activity, all M2 & P3 students are required to complete the Attitudes Toward Health Care Teams Scale, a 19-item questionnaire developed and validated by Heinemann that assesses general attitudes of team members from different professions toward working together. Subsequent to the completion of the 4-week long IPE activity, all M2 and P3 students are required to complete a post-activity survey. All surveys are administered electronically via Survey Monkey using a 5-point Likert scale ranging from strongly agree (5) to strongly disagree (1). Descriptive
and other statistical analysis will be conducted to compare the attitudes of M2 and P3 team members at baseline and post-IPE activity. **Results:** Results from the pre-post surveys will be analyzed and presented. **Implications:** Attitudes of medicine and pharmacy students toward working in health care teams may have an influential impact on future team participation, team functioning and ultimately the quality of care provided to patients. IPE activities may foster development of positive attitudes that may improve future team functioning.

**Implementation of a Mandatory Review Session in a Therapeutics Series.** Chad Coulter, Sullivan University, Maggie Mangino, Sullivan University, Sarah Smith, Sullivan University, Chris Betz, Sullivan University. **Objectives:** To assess the value of a Mandatory Academic Review Conference (MARC) for students who failed to demonstrate competency on weekly quizzes in a 4 course Therapeutics series. **Method:** The Therapeutics course series at Sullivan University College of Pharmacy (SUCOP) is divided into 4 courses over 3 quarters. The coordinators of Therapeutics implemented MARC in efforts prevent remediation by identifying students who did not display material competency. MARC was designed to encourage students to participate in active learning in hopes that this form of education would stimulate interest and learning in these students. In this course series, students were administered a weekly quiz over the previous week’s lecture material. Students scoring less than 69.5 percent on the weekly quizzes were required to attend MARC, which was held prior to examinations and facilitated by the clinical faculty who taught the material. MARC’s value was assessed by evaluating how many students who attended MARC passed the subsequent examination. The active learning techniques utilized during MARC were also recorded. **Results:** Results to be presented. **Implications:** Implications to be presented.

**Increasing Objectivity through the Development of a Standard Prerequisite Evaluation Guide.** Jacqueline Grosser, University of South Florida, Heather M.W. Petrelli, University of South Florida. **Objectives:** The purpose of this abstract is to share the process by which a comprehensive guide for approval of prerequisite coursework was created. The guide identifies specific content required for each prerequisite course vetted by the faculty and approved by the Admissions Committee as well as a listing of all courses from 2 and 4-year feeder colleges within the state of Florida that meet individual prerequisite guidelines. This guide serves as a standard for admissions staff by which all courses submitted for prerequisite fulfillment are evaluated. **Method:** Utilizing the University of South Florida (USF) undergraduate course descriptions as a starting point, standard course content was identified. The faculty approved the basic course content by which all prerequisite courses should be evaluated against with final approval by the Admissions Committee. Then, the Florida Statewide Course Numbering System was employed to create a centralized database for student MTM activities across a variety of settings with numerous faculty and preceptors making it difficult to assess scope and impact of these patient encounters. Online survey software was employed to create a centralized database for student MTM activities throughout the curriculum. We report here a feasibility assessment for using the online tool for collecting this type of information. **Method:** Paper MTM forms served as templates for MTM encounters, capturing: patient’s medical, psychosocial, economic, and family histories; prescription and non-prescription medications; physical assessment; laboratory data; medication related problems (MRPs); action plans; encounter location; and student information. Interventions were documented for the 3 highest priority MRPs on each patient. The forms were adapted to online survey format and pilot tested in the Fall of 2010. Students received the link to the online survey via email and entered the encounter data upon completion and faculty approval of their MTM cases. **Results:** In a single semester, 304 IPPE students in P1, P2, and P3 years used the tool to document 800 MTM encounters with 721 individual patients who reported having more than 2811 conditions. Students reviewed 4163 prescription medications and identified 2106 MRPs. Detailed information on the implementation and feasibility will be presented, including modifications for the second release. **Implications:** Online survey software is a useful tool for the centralized collection of information about student MTM activities allowing insight into student MTM experiences, patients encountered, and potential impact of student-provided services in the community served by the college.
Integrating Interprofessional Students in Emergency Preparedness Programs Anchored in a Rural/Frontier School of Pharmacy. Sara K. Lookabill, University of Wyoming, Beth Young, Albany County Public Health, Jennifer B. Steiner, University of Wyoming, Megan Saunders, University of Wyoming, Bryon Hopper, Public Health Emergency Preparedness, Wyoming Department of Health, Donna Artery, Office of Pharmacy Services, Wyoming Department of Health, Suzanne Clark, University of Wyoming. Objectives: Emergency preparedness challenges rural/frontier communities due to dispersed populations and limited qualified volunteers. Rural universities can provide communities with skilled volunteers through pre-professional and professional PharmD, Nursing, and Allied Health students. We aim to integrate these students into emergency preparedness programs. Method: Interprofessional student cohorts were recruited through leadership groups and classes for a new emergency preparedness program sponsored by Albany County and Wyoming State SNS and Emergency Preparedness Departments. Pharmacy-specific programs include SNS repackaging directives. Goals include (1) increased participation in SNS programs, (2) assessment of emergency preparedness knowledge, and (3) fostering interprofessional interaction. Surveys will assess pre/post event knowledge, experience, and future interests. A state/community-coordinated multi-agency exercise will occur 1 April 2011 using student volunteers. The event will be assessed by external reviewers. Results: Forty-two students volunteered. Assessment of goals include surveys and reviewer feedback to measure: student understanding of SNS and emergency procedures, knowledge of specific crises (e.g., Category A-C Agents), numbers receiving ICS training, volunteers per professional group, number of meaningful interprofessional interactions, and interest in future involvement. Implications: Rural communities will have trained professional students to assist in emergency response. Working in medical teams will foster interprofessional relationships. Students will understand local/state emergency resources available. This project meets best practice indices and a point-based grading scheme developed with student input. Student outcomes one year after completing a course in statistics. Method: The classes of 2010 and 2011 were enrolled in a statistics course during their third professional year. The class of 2010 was enrolled in the course during fall 2008 where a learning-centered (LC) approach to assessment was used including optional assignments and a point-based grading scheme developed with student input. In fall 2009, the class of 2011 was enrolled in a course with the same topics and sequence but using an instruction-centered teaching (IC) approach where students had no input on the grading scheme and the only assessments were required examinations. Before each course, students completed a brief assessment of statistical knowledge and the SATS-36 to measure attitudes towards statistics. Students were asked to complete the same questionnaires one year after the course. Mean scores for the SATS-36 and the statistical knowledge assessment will be compared between the two teaching approaches using repeated-measures ANOVA. Results: Data collection for the class of 2010 (LC class) is complete. The class of 2011 (IC class) is currently collecting the questionnaires. Data analysis will be conducted to examine differences in outcomes between the teaching approaches. Implications: Previous research demonstrated improvements in learning outcomes among students at the end of a course using an LC approach compared to one using an IC approach. Understanding the whether these differences persist can guide the selection of teaching approaches that promote long-term changes in student outcomes.

Leadership Excellence and Development (LEAD) Program: An Innovative Approach to Inclusive Excellence. Carla Y. White-Harris, University of North Carolina at Chapel Hill, Kelly Scolaro, University of North Carolina at Chapel Hill, Latasha Weeks, University of North Carolina at Chapel Hill, Jennifer Corinna, The University of North Carolina at Chapel Hill. Objectives: To utilize inclusive excellence as a recruitment strategy for fostering diversity and identifying future pharmacy leaders through innovative program design. Method: Elements of inclusive recruitment are a shared vision of achieving excellence through diversity, engaging underrepresented talent, and providing opportunities for professional development. To utilize this recruitment strategy, the LEAD program was established in 2009. The LEAD program seeks to expose underrepresented students to career opportunities in pharmacy. The program is held annually over a two day period, for high school and college students. Applicants are selected based on leadership potential, academic performance, and community engagement. Program participants engage in interactive activities on-site at the UNC Eshelman School of Pharmacy. Results: From 2009 to 2010, applicants increased from 103 to 224. In 2009, participant demographics included 66% female, 34% male, and 46% from underrepresented backgrounds. In 2010, participant demographics were comprised of 63% female, 28% male, and 37% from underrepresented backgrounds. Upon completion, 98% agreed they were more knowledgeable about the pharmacy field and 93% agreed the program increased their interest in pharmacy as a career. Implications: Inclusive excellence is a strategy for institutions of higher learning to produce leaders with the perspectives needed to best serve society. Our results show that after inclusion in a program like LEAD, the majority of students’ knowledge and interest in pharmacy increased. With these positive results, we plan to continue to use the LEAD program as a model of inclusive excellence for future recruitment.

Long-term Effects of Learning-centered Assessment Strategies on Pharmacy Students’ Attitudes Towards and Knowledge of Statistics. Spencer E. Harpe, Virginia Commonwealth University, Lisa B. Phipps, Virginia Commonwealth University. Objectives: To evaluate the effects of a learning-centered assessment approach on student outcomes one year after completing a course in statistics. Method: The classes of 2010 and 2011 were enrolled in a statistics course during their third professional year. The class of 2010 was enrolled in the course during fall 2008 where a learning-centered (LC) approach to assessment was used including optional assignments and a point-based grading scheme developed with student input. In fall 2009, the class of 2011 was enrolled in a course with the same topics and sequence but using an instruction-centered teaching (IC) approach where students had no input on the grading scheme and the only assessments were required examinations. Before each course, students completed a brief assessment of statistical knowledge and the SATS-36 to measure attitudes towards statistics. Students were asked to complete the same questionnaires one year after the course. Mean scores for the SATS-36 and the statistical knowledge assessment will be compared between the two teaching approaches using repeated-measures ANOVA. Results: Data collection for the class of 2010 (LC class) is complete. The class of 2011 (IC class) is currently completing the questionnaires. Data analysis will be conducted to examine differences in outcomes between the teaching approaches. Implications: Previous research demonstrated improvements in learning outcomes among students at the end of the course using an LC approach compared to one using an IC approach. Understanding the whether these differences persist can guide the selection of teaching approaches that promote long-term changes in student outcomes.

Medication Costs and Affordability Related Communication and Services at Community Pharmacies. Bupendra Shah, Long Island University, Shraddha Shinde, Long Island University. Objectives: This study aims to: Identify the extent of discussions with patients about medication costs and affordability in community pharmacies, to identify extent to which pharmacies offer services that can help patients with medication costs and improve affordability and assess pharmacy owner/managers’ attitude towards prescription assistance plans Method: A cross sectional exploratory design will be used to conduct a survey of pharmacy managers and owners of chain and independent pharmacies upon their consent. Using a convenience sampling strategy, a total of 30 pharmacy managers or owners will be asked to participate. Each pharmacy manager will complete a survey. The survey consists of questions and statements pertaining to patient-pharmacist communication about medication costs and affordability and demographics. Results: Results of the study will provide an insight into the attitudes of pharmacy owners and managers regarding reducing medication costs and affordability related barriers to access for medications. Implications: Medication cost and affordability remains a key barrier to patient adherence. New strategies are needed to help

Patient share the burden of their growing medication costs. This study will help shed light if pharmacy owners/managers have a positive attitude towards developing prescription payment assistance plans.

Pharmacy Case Studies in Second Life: An Elective Course. Michael Veronin, Texas A&M Health Science Center, Lacy Daniels, Texas A&M Health Science Center, Elaine Dumps, Texas A&M Health Science Center. Objectives: To implement and assess an elective course in pharmacy case studies for second- and third-year doctor of pharmacy (PharmD) students using Second Life, an interactive three-dimensional (3D) virtual environment. Method: This course explored the use of Second Life for education and training in pharmacy, emphasizing a case-based approach. Virtual worlds, such as Second Life, promote inquiry-based learning and conceptual understanding, and can potentially develop problem-solving skills in pharmacy students. Ten case scenarios were presented that primarily focused on drug safety and effective patient communication. Avatars, representing instructors and students, reviewed case scenarios during sessions in a virtual classroom. Individually and in teams, students participated in active-learning activities modeling both the pharmacist’s and patient’s role. Results: Student performance and learning were assessed based on Second Life class participation, activities, and assignments, and two formal, essay-type online exams in Blackboard. Student course evaluation results indicated favorable perceptions of content and delivery. Student comments included an enhanced appreciation of practical issues in pharmacy practice, flexibility of attendance, and an increased ability to focus on course content. Implications: This elective course was well received by our PharmD students. Excellent student participation and performance in weekly active-learning activities translated into positive performance on subsequent formal assessments. Student were actively engaged and exposed to topics pertinent to pharmacy practice that were not covered in the required pharmacy curriculum. The multiple active-learning assignments were successful in increasing students’ knowledge and provided additional practice in building communication skills, beneficial for students preparing for experiential rotations.

Pursuing a Career in Academia: Perceptions of Students and Pharmacists. Carla Y. White-Harris, University of North Carolina at Chapel Hill, Pamela U. Joyner, University of North Carolina at Chapel Hill, Jennifer Corinna, The University of North Carolina at Chapel Hill. Objectives: To understand the perceptions of students and pharmacists regarding academic careers in pharmacy and to evaluate the impact of gender, age, ethnicity, and exposure. Method: A survey was sent to 602 pharmacy students at the UNC Eshelman School of Pharmacy and 9536 licensed pharmacists in North Carolina. Questions included demographic information and items pertaining to exposure and perceptions of career opportunities in academia. Results: Respondents were comprised of 11% student pharmacists and 89% licensed pharmacists, 43% male and 57% female, 91% Caucasian, 4% African American, 1% Native American, 1% Hispanic, and 3% self-disclosed as other. Only 4% of respondents currently work in academia. The majority, 45% of working respondents, practice in community pharmacy. Thirty-five percent of respondents indicated interest in academia and 65% indicated no prior interest in academia. Main factors that enhanced attraction to careers in an academic practice setting included a desire to prepare future pharmacists, flexible hours, and interacting with students. Perceived undesirable influences were politics, low pay, and lack of geographic opportunity. Implications: A better understanding of perceptions regarding the desirability of an academic career track is necessary to develop strategies to nurture a strong and diverse group of future academic leaders. Skilled academicians play a vital role in educating, coaching, and mentoring students. It is evident that neither students nor pharmacist receive adequate exposure to the opportunities in academia. Fewer resources are available in the current economic climate; however recruitment and retention remain a high priority in a very competitive educational market.

Rx for Fitness: A Healthy Initiative Program at the University of Oklahoma College of Pharmacy. Alan R. Spies, The University of Oklahoma, Jane E. Wilson, The University of Oklahoma. Objectives: To develop a college-wide program designed to encourage students, residents, faculty and staff to engage in healthy lifestyles. This program, initiated in 2010, includes, but is not limited to, education and motivation regarding the need for exercise, diet and stress management. Method: All members of the University of Oklahoma College of Pharmacy were notified of this initiative through emails, bulletins, and presentations. Following completion of the 2011 three-month health and wellness initiative, all individuals at the College of Pharmacy were asked to complete a survey assessing various factors, such as motives for engaging in physical activity, current levels of physical activity, dietary habits, perceived barriers to engaging in physical activity and participation in the 2010 Rx for Fitness program. Results: It is anticipated that individuals who participated in the 2010 initiative were more likely to participate in the 2011 program. It is hoped that the individuals who completed the three-month program will demonstrate greater motivation for engaging in physical activity, better dietary habits and less perceived barriers to engaging in physical activity. Implications: If individual improvements are seen after completing the program, this initiative may serve as a model which other colleges and schools of pharmacy may emulate. As healthcare professionals, it is important to develop healthy habits that last a lifetime. Furthermore, since patients look to pharmacists as examples for improving their own health and well-being, it is imperative for colleges and schools of pharmacy to examine the critical role healthy lifestyles play in conveying this message.

Substance Abuse and Addiction Policies for Colleges and Schools of Pharmacy: A National Survey. Darren J. DeLong, Southern Illinois University Edwardsville, Lisa M. Lubsch, Southern Illinois University Edwardsville. Objectives: The purpose of this study is to determine the extent to which United States colleges and schools of pharmacy have addressed the issue of addiction and related disorders (AARDs) within the profession, by obtaining data on the presence or absence of AARD policies for both students and faculty, and the general nature of those policies. Method: The target audience was Assistant/Associate Deans of Student Affairs of all United States colleges and schools of pharmacy. An initial email was sent describing the project and stating that a second email would be received in four days which would contain a link to Survey Monkey. After four days, a second email containing the link was sent out. Two weeks after that, a reminder email was sent to all recipients with instructions to ignore it if they had already completed the survey. The survey consisted of 10-16 questions, depending on each individual’s responses. Information was collected pertaining to school demographics, current policy, and interactions with the Board of Pharmacy (BOP) and/or Pharmacist Recovery Network (PRN) of the school’s state. Results: This study is a work in progress. Results will be presented at the annual meeting of the American Association of Colleges of Pharmacy (AACP). Implications: It is hoped that this data will raise awareness among the schools surveyed of the importance of this subject, that guidelines for developing or revising a policy are available from AACP, and where their program stands in relation to their peers throughout the country.
Use of the APhA Career Pathways Evaluation Program in an Introduction to Pharmacy Course. Rondall E. Allen, Xavier University of Louisiana, Martha Harris, Xavier University of Louisiana.

Objectives: The objectives of the study are to evaluate student perceptions regarding the usefulness of the program in a first year pharmacy course and to evaluate the impact of program on the students’ understanding of various career choices and the ranking of their top three career choices. Method: Each student was given credit toward their final grade for participating in the program. The program included several surveys at the beginning and the end of the course and three workshops. One of the surveys was given at the end of the course to evaluate the usefulness of the workshops. A pre/post survey was given to evaluate the impact of the program on the students’ understanding/awareness of career choices and the ranking of their career choices. Results: Over ninety percent of the students participated in the program. The data is currently being analyzed with the intent to present at the AACP Annual meeting in July. Implications: The results will be shared with the assessment committee to determine if the program should be included in the Career Development Program for the College.

Using Facebook™ to Expand the Pharmacy Management Classroom. Jeff J. Cain, University of Kentucky, Anne Policastro, University of Kentucky. Objectives: To model appropriate and professional use of social media To supplement in-class learning with discussion of contemporary news items To expose students to a variety of national experts with whom they would normally not come in contact Method: Third professional year students (N=128) enrolled in a required pharmacy management and leadership course were invited to join a closed Facebook™ group. The objectives of the activity were explained to the students and they were informed that participation was optional. Potential bonus questions from the discussions were the only incentive for membership. A select group of national “experts” in pharmacy management and leadership were also invited to join the group. Course directors periodically posted links to online news and reports pertaining to pharmacy, management, and leadership. Guest experts were asked to post at least once during the semester and engage with students through follow-up comments. The Facebook activity will be evaluated through end-of-year course evaluations and student liaison focus groups. Student comprehension of the discussion topics will be assessed through performance on extra credit exam questions. Finally, descriptive statistics will be calculated for student membership, posts, and comments to the group. Results: Preliminary results indicate that a majority (72%, N=92) of the class chose to join the group. Data regarding student perceptions and group activity will be calculated at the end of the course. Implications: Results of this activity will be used to evaluate the use of social media as a method for exposing students to supplemental course content and connections with external experts.

SCHOOL POSTERS

A Capstone Laboratory Experience to Integrate Pharmacy Curriculum. Kristin Montarella, Southwestern Oklahoma State University, Tiffany L. Kessler, Southwestern Oklahoma State University, Erin D. Callen, Southwestern Oklahoma State University, Tom W. Davis, Southwestern Oklahoma State University. Active learning is a required component of the curriculum for the development of critical thinking and problem solving skills. Reinforcement, integration, and application of fundamental disease state and therapeutic knowledge are key for retention and further development of those skills. As an effort to meet these requirements, a capstone laboratory experience was developed for students preparing to begin advanced pharmacy practice experiences. This laboratory experience, known as Pharmaceutical Care Lab V, aims to integrate basic science and clinical knowledge engaging students in a wide variety of educational opportunities and assignments. The course starts with four weeks of traditional didactic lecturing over core topics that will be utilized when evaluating patient cases. The course then focuses on the development of problem lists and progresses to the development of pharmacotherapeutic care plans based on patient presentation. Faculty members are available to answer questions and facilitate group discussion over the primary disease state and optimal pharmacotherapy; related calculations, pathophysiology and pharmacology of primary and alternative treatments are also reviewed. Examination occurs via one multiple choice exam covering the introductory material; one case-based problem-list development exam with short answer pharmacotherapy and physiology questions; and one pharmacotherapeutic care plan exam. Critical thinking and problem solving skills are also reinforced through other assignments, parts of which incorporate online learning experiences. These experiences include three online calculation assignments (pharmaceutics and clinical calculations), two small-group care plans, a drug information project, two pharmacotherapy notes, and an online discussion board activity incorporating a variety of projects.

A Flavor of the Clinical Sciences in a Pharmacology/Medical Chemistry Course. Mustapha A. Beleh, University of Michigan. Pharmacy in its core is an interdisciplinary field and students are expected to possess concrete knowledge in a variety of disciplines. As part of the new curriculum implemented this year at the College of Pharmacy, University of Michigan, a new course sequence, Principles of Drug Action that integrates the Pharmacology and Medicinal Chemistry courses, was introduced. These courses are ultimately designed to give students a pharmacological introduction to each topic, followed by a discussion of the drug classes and culminating with the clinical pharmacology of these drugs. An important component in the pedagogical design of these courses is an attempt at integration of the basic science concepts with the clinical application of the drugs discussed. The approach to accomplish this goal started with aligning this new course sequence with the clinical sciences course sequence, where each topic discussed in the first course sequence is then addressed in the latter courses. Faculty teaching in the Principles of Drug Action courses discuss their presentation with their counterpart in the clinical sciences courses and make changes according to these discussions. A clinical faculty member complemented the class presentation with a clinical perspective. Finally, these courses included a weekly discussion session, where a number of case studies are discussed. These cases are designed to add a clinical flavor and prepare students for the clinical sciences courses that follow. Preliminary data indicate that these approaches have been successful and there is a continuous effort to add to the experience and deliver maximum benefits to students.

A Model for an Integrated Curriculum. Seth P. Brownlee, Northeast Ohio Medical University, Richard T. Carroll, Northeast Ohio Medical University; Scott S. Wimseski, Northeast Ohio Medical University; Elisabeth H. Young, Northeast Ohio Medical University; Richard J. Kasmer, Northeast Ohio Medical University, David D. Allen, Northeast Ohio Medical University. The Northeast Ohio Medical University is aggressively developing a highly integrated curriculum that focuses on interprofessional education. The core curricular elements include a unique blend of the foundational and clinical sciences with experiential activities. Each course and instructor
A Novel Approach of Integrating the Basic and Clinical Sciences into Advance Pharmacy Practice Experiences (APPE). Ronnie J. Moore, Touro College of Pharmacy-New York, Dipan B. Ray, Touro College of Pharmacy-New York, Thomas J. Cook, Touro College of Pharmacy-New York. Touro College of Pharmacy is a new pharmacy program located in the Harlem community of New York City; an integral focus of the curriculum is public health and clinical practice experiences. Experiential education comprises 45% of the four year 2+2 PharmD curriculum. An innovative component of the curriculum is the Grand Rounds Reflections Session. The format and structure of Grand Rounds Reflections provide a forum for the students to apply the knowledge acquired in the didactic curriculum to clinical cases. Activities in the Grand Rounds Reflections allow students to employ problem solving skills using evidence based medicine. The sessions are held during the P3 and P4 years in the third week of each six week APPE course and are led by faculty members from the Pharmaceutical and Biomedical Sciences and Pharmacy and Health Outcomes departments. Grand Rounds topics are chosen based on several criteria: current updates in pharmacy practice and public health; advanced topics that require reinforcement; and research topics of interest. The speakers present an overview of the topic from the basic science cellular level to the diagnosis, potential treatments, and monitoring parameters. The presentation is followed by a clinical case presentation where students work in pre-assigned groups to assess and present care plan recommendations. A survey tool was developed to specifically to gauge student’s comprehension of the importance of basic science in the foundation of clinical practice.

A Pharmaceutical Care Skills Course Sequence: A Hub for Integration. Jeanine M. Conway, University of Minnesota, Karen M.S. Bastianelli, University of Minnesota, Angela K. George, University of Minnesota, Christene M. Jolowysky, University of Minnesota, Nichole M. Kulinski, University of Minnesota, Edris Kosar, University of Minnesota. The University of Minnesota College of Pharmacy integrates basic sciences and clinical skills in a laboratory course sequence spanning 5 semesters and a capstone course in the 6th semester. With two campuses, course directors from each location deliver concurrent, coordinated courses that achieve aligned course objectives. In the laboratory experiences requiring extemporaneous and sterile pharmaceutical compounding (~40% of activities), students apply knowledge gained from drug delivery, microbiology, and calculations to prepare medications in context to patients’ drug-related needs. Students develop their pharmaceutical care skills in the remaining activities. Patient care simulations increase in complexity across the sequence requiring students to integrate oral and written communication skills with knowledge gained in pharmacotherapy, pharmacokinetics, and medicinal chemistry. Drug information activities occur longitudinally using various resources to provide information to specific audiences. Students hone clinical critical thinking skills in a clinical writing intensive capstone course. No new content is taught in class, and if a weekly assignment contains an unfamiliar condition or a drug, students are expected to be self-directed in learning additional content. This course immediately precedes APPE rotations and aims to prepare students for successful experiences. Future plans for this course sequence includes weaving content, assignments, and evaluation tools with introductory pharmacy practice experiences. As the College embarks on a significant curriculum revision, this sequence is core to helping students’ transition into pharmacists.

A Continuous Improvement Process for Integrated Basic and Clinical Sciences Courses in the PharmD Curriculum. Nader H. Moniri, Mercer University, J. Grady Strom, Mercer University, Laurel E. Ashworth, Mercer University, Candace W. Barnett, Mercer University, James W. Bartling, Mercer University, Christine M. Klein, Mercer University. The didactic PharmD curriculum at Mercer University includes nine organ system pharmacotherapy modules that incorporate biomedical and pharmaceutical sciences, as well as pharmacotherapeutics in the second and third professional years. Each course (or series of courses) begins with the anatomy/physiology of the organ system, followed by pathophysiology of the major disease states, medicinal chemistry and pharmacology of the drugs used to manage the disease states, culminating with clinically relevant material regarding the application of therapeutics in managing the respective diseases. Basic science and clinical case studies are components of courses and are designed to enable the student pharmacist to develop and implement a medication therapy management plan for individualized patients with specific disease states. Cases are designed to incorporate medications and concepts from previous courses, and these cumulative topics are also assessed via case-style exam questions which incorporate material from previous courses. To facilitate this process, the course coordinator and all faculty within the course meet prior to the initiation of the course to discuss topics for inclusion, the depth and time allocation of each topic, the lecture schedule, use of breakout groups, activities, examinations, and content integration. Within two weeks of completion of the course, post-course meetings are held for debriefing and future planning on course content and integration, and this process results in preparation of an end of course report, which is submitted to the Curriculum Committee for review. Examples from several courses demonstrating the process and changes resulting in better integration for future offerings will be presented.

A New Integrated Dermatology Course for Pharmacy Students. Fei Wang, University of Connecticut, Lauren S. Schlesselman, University of Connecticut, Brian J. Aneskiевич, University of Connecticut. Objective: To design, implement, and evaluate an integrated basic and clinical science course on dermatology and assess its effect on pharmacy student’s perceptions, attitudes, and knowledge. Methods: A novel one credit dermatology module was implemented in
spring 2010 as a part of the core curriculum. The course was designed so that students received the knowledge component of the course delivered via on-line lectures, readings, web based activities and a weekly on-line quiz to be completed prior to class meetings. Class time was utilized for case discussions and application of the material learned. A pre-and-post course survey using a Likert-type scale (1=strongly agree, 5=strongly disagree) and descriptive statistics was used and data will be collected for two consecutive years. This study was approved by the University of Connecticut Institutional Review Board. Results: A total of 76 students participated in the pre-course survey and 84 students participated in the post-course survey in 2010. Eighty-one percent were currently employed in either a community or hospital pharmacy. At the start of the semester, students supported the inclusion of dermatology in the curriculum but did not feel competent in caring for patients with dermatologic conditions. At the end of the semester, students felt competent in achieving all the course objectives and strongly agreed that this course enhanced their knowledge of common dermatological conditions encountered in a community or ambulatory care setting. Conclusion: Most student pharmacists believe that the inclusion of a dermatology course is useful and will enhance their roles as pharmacists.

Administrative Restructuring Based on ACPE Accreditation Standards. Teresa A. Schweiger, Lake Erie College of Osteopathic Medicine School of Pharmacy, Sunil Jambhek, Lake Erie College of Osteopathic Medicine School of Pharmacy, Naushad K. Ghilzai, Lake Erie College of Osteopathic Medicine School of Pharmacy, Julie J. Wilkinson, Lake Erie College of Osteopathic Medicine School of Pharmacy, Lakku Keshvara, Lake Erie College of Osteopathic Medicine School of Pharmacy, Hershey S. Bell, Lake Erie College of Osteopathic Medicine School of Pharmacy. LECOM School of Pharmacy, a private non-profit institution, is located in Erie, Pennsylvania with a branch campus in Bradenton, Florida. The school offers both a 3- year accelerated PharmD program in Erie and a traditional 4-year program in Bradenton. In July 2010, the School of Pharmacy implemented administrative restructuring with the goal of unifying both campuses as one school consistent with the institution’s theme of “One LECOM/LECOM #1.” Additional goals included: streamlining and improving efficiency on both campuses, improving communication across campuses and between administration and faculty/staff, leveraging human resources, integration of faculty, and a greater focus on the ACPE accreditation standards. With the arrival of a new Dean, LECOM transitioned from a traditional department structure which included departments with a separate chair for each department on each campus to a structure with functional teams determined by the accreditation standards categories. Departments and Chairs were eliminated, and new Dean’s positions and teams were formed to oversee standards for (a) mission, planning, evaluation, organization, and administration (1-8); (b) curriculum (9-15); and (c) faculty and staff (24-26). An Assistant Dean for assessment oversees standards 3 and 15. The remaining standards are addressed institutionally. Details of this transition as well as the results of a faculty survey addressing the perceived effectiveness of the changes will be presented.

An Elective Course on Pharmacy Case Studies in Second Life. Michael A. Veronin, Texas A&M Health Science Center, Lacy Daniels, Texas A&M Health Science Center, Elaine L. Demps, Texas A&M Health Science Center. Objective/Intent: To implement and assess an elective course in pharmacy case studies for second- and third-year doctor of pharmacy (PharmD) students using Second Life, an interactive three-dimensional (3D) virtual environment. Methods/Process: This course explored the use of Second Life for education and training in pharmacy, emphasizing a case-based approach. Virtual worlds, such as Second Life, promote inquiry-based learning and conceptual understanding, and can potentially develop problem-solving skills in pharmacy students. Ten case scenarios were presented that primarily focused on drug safety and effective patient communication. Avatars, representing instructors and students, reviewed case scenarios during sessions in a virtual classroom. Individually and in teams, students participated in active-learning activities modeling both the pharmacist’s and patient’s role. Results/Outcomes: Student performance and learning were assessed based on Second Life class participation, activities, and assignments, and two formal, essay-type online exams in Blackboard 9. Student course evaluation results indicated favorable perceptions of content and delivery. Student comments included an enhanced appreciation of practical issues in pharmacy practice, flexibility of attendance, and an increased ability to focus on course content. Implications: This elective course was well received by our PharmD students. Excellent student participation and performance in weekly active-learning activities translated into positive performance on subsequent formal assessments. Student were actively engaged and exposed to topics pertinent to pharmacy practice that were not covered in the required pharmacy curriculum. The multiple active-learning assignments were successful in increasing students’ knowledge and provided additional practice in building communication skills, beneficial for students preparing for experiential rotations.

An Integrated Course Sequence that Connects Basic Pharmaceutical with Clinical Sciences. Conrad Dhing, Husson University, Eric J. Jarvi, Husson University, Leslie L. Devaud, Husson University, Anne Teichman, Husson University, Ahmed Abdelmageed, Husson University, Dmitri Cohen, Husson University, Bethany A. Lessard, Husson University. The objective of this poster is to describe a recitation and laboratory-based course that integrates physiology, pathophysiology, drug action, patient communication, biomedical ethics, and disease monitoring during the first two years of the pharmacy curriculum at Husson University School of Pharmacy. Cognitive, Communication, and Case-Based Critical Thinking (4C’s) is a 6-semester sequential course that utilizes case-based recitations and practice skills laboratories to connect content delivered in didactic coursework throughout the first 3 years of the curriculum. The concept of the course is to link the coverage of disease states from the micro-perspective of physiology, pathophysiology, and drug actions to the macro-concept of patient communication, biomedical ethics and disease monitoring. The recitation component of the course meets for 2 hours twice a week in sections of 10-12 students to enable students to work in small groups for research and presentations on cases. The clinical laboratory section meets for 3 hours per week in sessions of 30-33 students to develop hands-on clinical skills relevant to the cases. Diseases covered during the first two professional year of the curriculum include COPD, asthma, diabetes, and hypertension. After the first year of the 4C’s course, minor adjustments are made by faculty from both departments to streamline and optimize the content across the sciences. The integration of basic pharmaceutical and clinical sciences education enables students to observe and comprehend the connections from the micro-perspective to the macro-concepts of diseases in pharmacy education.

An Integrated Elective Course in Pain Management and Palliative Care - Development, Implementation and Evaluation. Justin Kullgren, Roseman University of Health Sciences, Elizabeth J. Unni, Roseman University of Health Sciences, Rajan Radhakrishnan, Roseman University of Health Sciences, Elizabeth Sebranek, Roseman...
An Integrated, Innovative, and Accelerated Doctor of Pharmacy Program at Roosevelt University College of Pharmacy. Abby A. Kahaleh, Roosevelt University. Introduction/Background: The leadership team and faculty at Roosevelt University College of Pharmacy (RUCOP) collaborated on developing a (3) year accelerated PharmD program that focuses on delivering an integrated curriculum of didactic and experiential courses. Objectives: To present examples of integrated courses that were created by course development teams from the basic, clinical, experiential, and administrative sciences departments. Methods: To ensure the quality of education at RUCOP, an integrated strategy was implemented to develop the structure of courses, establish the curricular pedagogy, and assess the educational outcomes. Course development teams representing faculty from Biopharmaceutical Sciences, Clinical and Administrative Sciences, and Experiential Education were created to develop departmental courses, Integrated Course Sequences, and Educational Care labs. IPPE (year 1) and Interprofessional experiences (year 2) were tailored to integrate and apply knowledge acquired from courses in “real life” practice settings on a weekly basis. Assessment of students’ educational and ability-based outcomes will be based on mapping the integrated curriculum to ACPE Standards, CAPE Supplemental Outcomes, knowledge-based annual academic assessments, and Advanced Pharmacy Practice Experiences (year 3). Results: Assessments will include formative and summative evaluations designed for both individuals and groups exposed to traditional content in a student-centered and team-based learning environments. Conclusion: Given the team-based and integrated pedagogy at RUCOP, we expect our graduates to be committed, competent, and compassionate about delivering quality patient-centered services, collaborating within interdisciplinary teams, and advancing the pharmacy practice in their communities.

Assessment of Student Knowledge in Individual Content Areas for Nine Integrated Drugs and Disease Courses. S. William Zito, St. John’s University, Marc Gillespie, St. John’s University, Anthony C. Marziliano, St. John’s University, Gina M. LaPan, St. John’s University. Introduction: The College’s entry-level Pharm.D. curriculum contains a sequence of nine Drugs and Disease courses that integrate didactic content from pathophysiology, medicinal chemistry, pharmacology and therapeutics. Faculty concern over issues related to student competence in discipline-specific didactic knowledge within the integrated course sequence resulted in a formal assessment of knowledge retention. An additional outcome of this assessment is the collection of validated questions for use in a knowledge-based competency examination. Methods: Summative methods to establish a benchmark for the achievement of competence in each of the four didactic components of the integrated course sequence include evaluation of student performance on embedded content-specific examination questions; Pearson product-moment correlation coefficients between grades achieved in the discipline-specific introductory courses and in each didactic area of the integrated courses, and an evaluation of a success ratio that measures whether the top or bottom portion of students from the introductory courses improved or declined in performance in each didactic area of the integrated D&D sequence. Results: We desired to establish a rigorous standard for competence in didactic content. Preliminary data indicate that the percentage of students that achieved a grade of ≥75% in pathophysiology, medicinal chemistry, pharmacology and therapeutics were 54%, 48%, 63% and 44% respectively. There is a small but significant correlation between grades in the introductory and integrated courses. Formative data on student performance including faculty and student perceptions of the causes of content disconnect are needed to point the way forward.

Assessment of Basic and Clinical Science Content Integration in the Didactic Curriculum Using Curricular Mapping. Fadi T. Khasawneh, Western University of Health Sciences, Anandi V. Law, Western University of Health Sciences, Cynthia Jackevicu, Western University of Health Sciences, Wallace J. Murray, Western University of Health Sciences, David Q. Pham, Moses S. Chow, Western University of Health Sciences, James D. Scott, Western University of Health Sciences, Sunil Prabhu, Western University of Health Sciences, Daniel C. Robinson, Western University of Health Sciences. Intent: The Assessment Committee (AC) developed a curricular mapping tool to assess coverage and progression of content within the PharmD curriculum. Progression and integration of basic and clinical sciences was examined as part of this process. Process: The AC developed a curricular mapping tool based on delivery and assessment of course level ability based outcomes (ABOs). These ABOs were selected from our overall (50) ABOs by course coordinators planning their syllabi. Upon course conclusion, coordinators used the tool to report achievement of ABOs: level of delivery (e.g., introduced); mode of delivery (e.g., lecture); means for assessing achievement (e.g., OSCE); and expected level of achievement (e.g., novice). They were also asked to reconsider future inclusion of each ABO based on cognitive reflection while completing the survey. Results: Curricular mapping was implemented starting Fall 2010. Twelve courses have completed the assessment thus far: 3 from basic science; 7 therapeutics and 2 social administrative. Evidence from initial analysis suggests partial integration of content, notably in courses where basic science and clinical faculty consulted with one another. Some gaps were noted in integration in topics such as cardiology, where such conversations were in the initial stages. Other broad areas for improvement could be integration of pathophysiology and pharmacology of several topics. Implications: Our results suggest
need for improved collaboration between basic science and clinical faculty to ensure better integration of basic and clinical science content in the PharmD curriculum; achievement of educational standards; and ultimately, better patient care practices.

**Bridging the Gap between Basic and Clinical Sciences: The Role of High Fidelity Human Patient Simulation.** Amanda M. DeAngelis-Chichester, The University of Rhode Island, Celia P. MacDonnell, The University of Rhode Island, Clinton O. Chichester, The University of Rhode Island. The University of Rhode Island, College of Pharmacy has used medical simulation to provide an intensive, immersive experience by delivering dynamic disease states in a safe, realistic, environment. Through self-assessment we have found high-fidelity human patient simulation (HPS), provides an ideal opportunity to practice the basic principles of physiology and pharmacology in a “hands on” problem-based system that appeals to today’s technology driven learners. Accordingly, we have integrated HPS activities into the entire professional curriculum. In the P1 year, simulation is used to illustrate basic pharmacologic principles such as autonomic pharmacology, while also demonstrating the challenges of managing complex disease states. In the P2 year, students practice physical assessment skills and formulate therapeutic recommendations for simulated patients with common disease states including asthma and COPD. Scenarios of greater complexity and depth are used in the P3 year which fosters the use of higher-level critical thinking skills while using a team-based approach to patient care. Senior nursing students, second year medical students and pharmacy students are brought together for inter-professional learning using simulation. The students obtain physical findings, complete a medication history and determine other pertinent information necessary for the development of a care plan for the simulated patient. Finally, selected APPE students rotate into the simulation lab where they develop simulation of a care plan for the simulated patient. Finally, selected APPE students rotate into the simulation lab where they develop simulated patients by using data obtained from a primary literature search to model disease states that can be used for peer-to-peer instruction. This affords practical applications of evidence-based guidelines that the P4 students will soon put into their own practice.

**Bridging the Gap between Science and Practice through the PharmGenEd™ Program.** Sarah McBane, University of California, San Diego, Nathan A. Painter, University of California, San Diego, Kelly C. Lee, University of California, San Diego, Joseph D. Ma, University of California, San Diego, Philip E. Bourne, University of California, San Diego, James R. Halpert, University of California, San Diego, Palmer W. Taylor, University of California, San Diego, Grace M. Kuo, University of California, San Diego. “Pharmacogenomics Education Program: Bridging the Gap between Science and Practice” (PharmGenEd™) is an evidence-based pharmacogenomics education program designed for pharmacists and physicians, pharmacy and medical students, and other healthcare professionals. Pharmacogenomics originally began as a basic science, but advances in recent years have become more clinically relevant. A team of basic science and clinical faculty at UC San Diego Skaggs School of Pharmacy and Pharmaceutical Sciences is collaborating with national professional and healthcare organizations to deliver PharmGenEd™ materials to pharmacists, physicians, and other healthcare professionals. Pharmacogenomics originally began as a basic science, but advances in recent years have become more clinically relevant. A team of basic science and clinical faculty at UC San Diego Skaggs School of Pharmacy and Pharmaceutical Sciences is collaborating with national professional and healthcare organizations to deliver PharmGenEd™ materials to pharmacists, physicians, and other healthcare professionals. The team accessed scientific and clinical resources in development of the program, including known genomic databases and national pharmacy organizations. The objective of PharmGenEd™ is to increase awareness about current knowledge of the validity and utility of pharmacogenomic tests and implications of their therapeutic use. The curriculum related to pharmacogenomic concepts and clinical applications is disseminated via presentations and printed materials. A “Train-the-Trainer” shared curriculum is available for all schools of pharmacy. Together with a national network of basic scientists and clinicians, we have developed nine evidence-based peer-reviewed modules including an overview, specific disease states and economic perspectives. Since 2009, the program has reached 51,000 health care professionals. Approximately 100 clinicians and pharmacy faculty have been trained. More than 8,260 visitors from 97 countries have browsed the program website, with 71,870 page views and 1,500 registrants to date. PharmGenEd™ represents a notable example of the link between basic science and clinical education and practice.

**Building a Coherent Curricular Interface in a Learner-Centered Paradigm.** Reza Karimi, Pacific University Oregon, Kenneth C. Jackson, Pacific University Oregon, Susan M. Stein, Pacific University Oregon. Pacific University School of Pharmacy employs a learner-centered paradigm that provides a collaborative, supportive, and active learning environment for faculty, preceptors, and students. Our learner-centered paradigm has built a curricular interface that correlates pharmaceutical sciences with clinical sciences and promotes integration between didactic and experiential curricula to assist students in mutually mastering both disciplines. In addition, our learner-centered paradigm increases faculty’s awareness across curricular disciplines, promotes faculty’s teamwork dynamic, enhances the effectiveness of curricular delivery to students, and invigorates preceptors’ knowledge of the curricular topics. We have established a series of carefully designed integrative curricular activities across the entire PharmD curriculum to promote student’s self-directed learning, active learning, critical-thinking, knowledge retention, and teamwork skills. These integrative activities include: learning bridge assignments, IPPE discussions, health-system simulated experiences, clinical correlations, clinical skill assignments, simulated IPPE assignments, integrative learning and assessment activities, APPE poster formations and presentations, interprofessional team-based tasks, interprofessional case conferences, and end-of-year assignments. Our implemented assessments and their analyzed data provided compelling information that the implemented curricular activities were considered valuable and productive. Our findings indicated that building a coherent curricular interface promoted a cooperative and supportive learning environment and assisted faculty, preceptors, and students in enhancing curricular awareness and effectiveness. The importance of these integrative activities to shift from a traditional teaching-centered paradigm to a learner-centered paradigm will be discussed. In addition, the above integrative activities will be introduced, assessment data will be presented, and strengths and challenges of these integrative activities will be addressed.

**CYP1A2 Genotype Analysis in a Cohort of Pharmacy Students as an aid in Teaching Pharmacogenetics.** James G. Mitroka, Palm Beach Atlantic University, Lunawati Bennett, Palm Beach Atlantic University. This study determined the genetic status (genotype) of a polymorphic drug-metabolizing enzyme, CYP1A2, in a volunteer cohort of first-year pharmacy students, as a platform for discussion in a class in pharmacogenetics. Genetic variations in this marker influence the metabolic rate of drugs (e.g., clozapine, olanzapine, and tacrine) and common natural products (e.g., caffeine and melatonin). A 1 to 2 mL sample of saliva was collected from each participant and the DNA was extracted from the cellular material using the Qiagen SpinColumn DNA isolation procedure. A 20 ng portion of each DNA isolate was analyzed for the CYP1A2*A and CYP 1A2*F alleles using a TaqMan SNP Genotyping assay kit along with a StepOne Real-Time PCR system (Applied Biosystems). From a class of 78, 44 students volunteered to participate in the study. Of the 44 volunteers, 44
24 were heterozygous (CYP1A1*A/F), 2 were homozygous for the CYP1A2*A allele, and 18 were homozygous for the CYP1A2*F allele. These results are consistent with the population results reported in the literature and indicate that most of the students carry at least one genetic copy of the inducible CYP1A2*F allele. The individual results were shared anonymously with the volunteers and the composite results were discussed in the student’s pharmacogenetics section of class. This study demonstrates how a simple genotyping procedure can be used to generate student participation and enthusiasm for learning about pharmacogenomics. A future study is planned to evaluate the relationship between phenotype (metabolic rate) and genotype using a probe marker of CYP1A2 metabolism.

**Climbing Harden’s Ladder: Harmonization, Temporal Coordination, and Correlation.** Marion L. Pearson, The University of British Columbia, David W. Fielding, The University of British Columbia, Simon P. Albon, The University of British Columbia, Colleen M. Brady, The University of British Columbia, Kishor M. Wasan, The University of British Columbia, Arun K. Verma, The University of British Columbia. We highlight integrative efforts facilitated by the Faculty’s Program Director and Year Coordinators, with reference to Harden’s integration ladder and evaluation from the instructors’ perspective. 1) “Harmonization”: 1st year medicinal chemistry and pharmacy skills were integrated through a “Top 200” drug list in use in the pharmacy skills course. Chemical structures were added to the list, which became a source of examples for lectures, assignments, and examinations in the medicinal chemistry course and a case study in the pharmacy skills course. Instructors noted increased efficiency in designing learning and assessment activities and greater student appreciation for the relevance of medicinal chemistry in pharmacy practice. 2) “Temporal Coordination”: 3rd year pathophysiology, pharmacology, therapeutics, self-care, and pharmacy practice were integrated through topics in common, such as diabetes, hypertension, female reproduction, and vitamins/minerals. Instructors met to align timing and content, resulting in greater awareness of each others’ material and approaches and avoidance of gaps, overlaps, and contradictions in content. 3) “Correlation”: A team-taught, participatory lecture on osteoporosis integrating 3rd year pharmacology, pathophysiology, therapeutics, case-based learning, and self-care was developed. Instructors found the integration effective but noted the interactive session was difficult to deliver within lecture time constraints, so it will be moved to a tutorial time in 2011/12. In addition, 2nd year pharmaceutical chemistry, pharmaceutics, pathophysiology, pharmacology, therapeutics, self-care, and pharmacy practice are being integrated through a case study incorporating elements of all disciplines. Implementation of this “super case” is planned for 2011/12.

**Clinical and Translational Science: Pharm.D. to Ph.D. and Beyond.** Bradley G. Phillips, The University of Georgia, Susan C. Fagan, The University of Georgia, Paul J. Brooks, The University of Georgia, Brian D. Buck, The University of Georgia, George E. Francisco, The University of Georgia. **Objectives:** Clinical and translational research has rapidly been established at health science colleges nationally, necessitating integration of basic and clinical science education. Our objective was to leverage strengths in the college to provide students with a continuum of integrated curricular opportunities in clinical and translational research. **Methods:** Key areas of existing strength include a Ph.D program in Clinical & Experimental Therapeutics (translational research), masters in regulatory affairs, graduate certificate in clinical trials design and management, and post-graduate residency programs. New programs were developed and specific steps taken to link these areas of strength to foster clinical and translational education across programs. These were incorporated into the college’s strategic plan. **Results:** Residency programs have been moved to the Graduate School, providing a mechanism for residents to take translational research, regulatory affairs and clinical trial design and management graduate program courses. New Pharm.D. electives were developed to engage students in translational research as well as graduate and post-doctoral education. APPE and Ph.D. students learn together on clinical rotations. Resources have been allocated for Pharm.D. students to participate and present clinical and translational research projects. In 2010, twenty-four percent of the graduating class attended and presented at a national meeting. A Southern Translational Education and Research (STAR) Conference was developed. This regional conference increased professional, graduate and post-graduate student interactions across health science disciplines in translational research. **Implications:** Basic and clinical sciences were integrated throughout the college by integrating and expanding existing translational research and education curricula across professional, graduate and post-graduate training programs.

**Comprehensive Integration of Basic and Clinical Sciences within the South University School of Pharmacy Curriculum.** Martin M. Zdanowicz, South University, Michael D. Schwartz, South University, Melissa C. Jones, South University, Curtis E. Jones, South University, James W. Fettermen, South University, Gabriella P. Fischer, South University, Earle W. Lingle, South University, J. Walter Sowell, South University, Sarah F. Braga, South University, William P. Wynn, South University, James E. Wynn, South University. Current ACPE accreditation guidelines emphasize the importance of curriculum integration across the basic and clinical sciences. The most successful pharmacy students are able to apply the fundamental knowledge from their basic science classes to the clinical sciences. At the South University School of Pharmacy (SUSOP), we take great pride in the extent to which seamless curriculum integration has occurred across the basic and clinical sciences. Our Integrated Sequence (IS) Modules (quarters 2-9) are therapeutic class/system-based courses that integrate content from Medicinal Chemistry, Pharmacology and Therapeutics. Each module has a science and practice faculty coordinator who meet regularly to ensure comprehensive and up to date coverage of material. Weekly IS recitation sessions involve both science and clinical faculty and require students to apply information they learned in lecture to integrated patient case studies. The Pharmacokinetics sequence at SUSOP likewise fully integrates basic science and therapeutic applications into a problem based learning format. Integrated Pharmacy Skills Laboratories and numerous electives offerings at SUSOP are also conducted jointly by science and clinical faculty who integrate content in both areas. Data from focus groups, course evaluations and standardized surveys show that student and faculty perceptions of curriculum integration at SUSOP are overwhelmingly positive. Effective curriculum integration requires good communication between faculty as well as a certain degree of open-mindedness and flexibility. Multiple points of curriculum assessment are also vital for continuous improvement. Despite the challenges, effective curriculum integration produces graduates who are highly confident, competent, and ready for clinical practice.

**Course and Faculty Integration in an Accelerated Three-Year Curriculum.** Donna M. Adkins, Appalachian College of Pharmacy, Charles R. Breese, Appalachian College of Pharmacy. The Appalachian College of Pharmacy is an accelerated three-year doctorate of pharmacy program located in rural Appalachia. The curriculum is
Curricular Integration: Pharmacology, Therapeutics, Practice Lab and Case Studies. Laurent M. Czosnowski, University of the Sciences, Quinn A. Czosnowski, University of the Sciences, Gladys G. Duenas, University of the Sciences, Jonny M. George, University of the Sciences, Karen J. Tietze, University of the Sciences, Laura L. Bio, University of the Sciences, Michael J. Cawley, University of the Sciences, Lindsay B. Curtin, University of the Sciences, Daniel A. Hussar, University of the Sciences, Lauren K. McCluggage, University of the Sciences, Diane W. Morel, University of the Sciences, Jean M. Scholtz, University of the Sciences, Sarah A. Spinler, University of the Sciences, Joan Tarloff, University of the Sciences, Trent G. Towne, University of the Sciences, Craig B. Whitman, University of the Sciences, Adeboye Adejare, University of the Sciences, Bruce R. Canaday, University of the Sciences, Laura A. Mandos, University of the Sciences, Cathy Y. Poon, University of the Sciences, Lisa A. Lawson, University of the Sciences. Objectives: Describe the process of integrating twelve new Doctor of Pharmacy courses (three pharmacology, five pharmacotherapeutics, four practice labs/case studies) and present the results from the first 2-year cycle. Background: A multidisciplinary committee was formed in 2008 and charged with developing the twelve new courses. The charges were expanded in 2009 to include aligning and integrating course content within and across these courses and assessing outcomes. Methods: The initial pedagogical plan included active learning, gradually increasing student responsibility for learning through the use of disease and drug roadmaps and pharmacology worksheets, and use of online individual and group readiness assessment tests (iRATS and gRATS). To facilitate multidisciplinary integration, a prototype pharmacology drug list was developed. Content across all twelve courses was aligned. Assessments included student and faculty surveys, grade distributions and correlations, and primary trait outcomes (math analysis, verbal communication, and therapeutic decision making). Results: At the end of the 2009-2010 academic year, the Committee simplified the drug and disease roadmaps, moved the Nonprescription Drugs pharmacotherapeutics course to the Fall P2 semester, shifted some topics between courses, realigned the content and replaced the iRATS and gRATS with online preparedness assessment tests. At the end of the Fall 2010 semester, the Committee recommended continuing the current plan for the 2011-2012 academic year. Implications: Course integration across and within departments requires the support and commitment of all faculty. Data are not yet available to determine if course integration has a positive impact on student achievement.

Curricular Revision Incorporating Pathophysiology, Pharmacotherapeutics, Practice Labs, and Community Service to Enhance Content Delivery. Jennifer L. Kirwin, Northeastern University, Margarita V. DiVall, Northeastern University, Mark Douglass, Northeastern University, Michael Gonyeau, Northeastern University, Michelle Jacobs, Northeastern University, Maureen McQueny, Northeastern University, J. Andrew Skirvin, Northeastern University, Jenny A. Van Amburgh, Northeastern University, Mark D. Watanabe, Northeastern University, David P. Zgarrick, Northeastern University. Objective: To integrate Pathophysiology, Self-Care Therapeutics (SCT), Pharmaceutical Care (PC), and Therapeutics courses to create efficiency and increase incorporation of public health, drug interactions, and pharmacogenomic information. Methods: Course coordinators revised the sequence using assessment data, national standards and survey results from faculty and students. Total hours previously devoted to each topic across all eight courses were examined and content re-aligned into integrated disease management modules within a seven module Comprehensive Disease Management course series and corresponding small group seminars. When possible, content was streamlined and additional topics were incorporated. Accompanying seminar, PC lab content and assignments were similarly re-aligned. A faculty manual was developed to create consistency in content and assessments while emphasizing integration of material. Each module was evaluated at mid-point and completion by students throughout the first cycle of implementation (Jan 2010 through April 2011). Coordinators met monthly to discuss course progress and respond to feedback. Additional evaluations are planned to gather feedback from faculty, preceptors and students. Results: The revisions were credit neutral and allowed for several new topic areas, an additional seminar course, skills lab, and public health project. Overall feedback from students was positive. Concerns include potential for lack of specific emphasis and assessment of pathophysiology, physical assessment, and SCT content without focused courses in these areas. Results of student evaluations, preceptor and faculty surveys will be presented. Implications: Course integration allowed for efficiency in content delivery and expansion of topics. Ongoing assessment will further refine this course sequence.

Design and Development of a Coordinated and Multidisciplinary Approach to Teaching Pharmacy Students Oncology Concepts. Robert L. Chapman, Midwestern University’s Chicago College of Pharmacy, Annette Gilchrist, Midwestern University’s Chicago College of Pharmacy, Deborah Hass, Midwestern University’s Chicago College of Pharmacy. Given the task of implementing a stand-alone medicinal chemistry course to cover only antineoplastic agents for a revised PharmD curriculum, we have developed a lecture based course covering the chemical principles of traditional cytotoxic therapies as well as emerging targeted therapeutics. To couple didactic training with clinical acumen in teaching antineoplastic agents, a clear and conscious collaborative effort was made between the Department of Pharmaceutical Sciences, which teaches the medicinal chemistry coursework, and the Department of Pharmacy Practice, which teaches therapeutic content. As a result, students take a required course, PSCI 1552 Chemical Principles of Drug Action IV, in the winter quarter of their third professional year followed by PPRA 1573 Pharmacotherapeutics VI in the spring quarter. This approach frontloads information such as molecular
principles of drug action and relevant structure activity relationships for antineoplastic agents before students are presented with their clinical application in the pharmacotherapeutics course. It is hoped that by working together and sequentially coordinating the presented material for medicinal chemistry and therapeutics our pharmacy students will be better able to meet the increasing informational demands being placed upon them.

**Developing an Integrated Pharmacy Applications (IPA) Course Series to Link the Didactic Curriculum.** Rachel Slaton, Samford University, Amy E. Broeseker, Samford University, Mary R. Monk-Tutor, Samford University, Terri M. Wensel, Samford University, Michael G. Kendrach, Samford University, Bruce Waldrop, Samford University. **Objectives:** Describe the process for designing and implementing a course in each semester of the first three years of the professional curriculum that horizontally and vertically integrates content and emphasizes practical application of knowledge and skills. **Methods:** As part of a revised curriculum, a course sequence was designed that includes a weekly skills lab and bimonthly case discussions. The course was first implemented for P1 students in fall 2009. The success of the courses was evaluated by both P1 and P2 students at the end of the fall 2010 semester using a 4-point Likert scale. Skills lab sessions and case discussions were evaluated separately. **Results:** Response rate was 39% (n=50) and 38% (n=48) for P1 and P2 students, respectively. The majority of both P1 and P2 students agreed that the courses’ objectives were met (98% for both); workload was appropriate based on credit hours assigned (84%, 98%); topics were well coordinated (96%, 100%); material was relevant and practical (100%, 98%); and material was presented at an appropriate level (98% for both). Overall, a majority of students rated the skills lab (98%, 96%) and case discussions (82%, 98%) as excellent. **Implications:** Student feedback indicates that the IPA course has been successful at integrating didactic content with practical pharmacy application early in the curriculum. This feedback will be valuable for documentation and assessment of curricular integration. Knowledge of this integration approach will be important to other schools needing to meet ACPE content integration standards.

**Development of an Advanced Pharmacy Practice Experience at an area Behavioral Health Center Genetics Laboratory.** Dennis D. Hedge, South Dakota State University, James R. Clem, South Dakota State University, Gareth E. Davies, South Dakota State University. The College of Pharmacy at South Dakota State University, the Department of Psychiatry at Sanford School of Medicine - University of South Dakota, and the Avera McKennan Behavioral Health Center have collaborated to develop the Avera Institute for Human Behavioral Genetics (AIHBG). Since its inception in 2007, AIHBG has become a key center in a network of psychiatric genetics research groups using state of the art technologies to determine genetic susceptibility of the development of behavioral disorders in children and guide therapy decisions. To demonstrate the role such a laboratory can have on the clinical decision making process, the College of Pharmacy has developed an elective Advanced Pharmacy Practice Experience (APPE) at AIHBG. P4 students completing the APPE spend time in both the laboratory and patient care setting at the Avera Behavioral Health Center. During the five-week experience, students gain exposure to genetic evaluation/testing, participate in patient care activities within the hospital, and complete a project. To date, projects have included Pharmacogenomics, ADHD Genetics, and Genome Wide Association studies. Although a relatively small number of students have completed the APPE to date, it does appear that exposure to the utilization of genetic information to make clinical decisions has influenced students when making career decisions.

**Does an Integrated Curriculum Lead to Improved Confidence to Practice?** Raymond C. Love, University of Maryland, Lisa Lebovitz, University of Maryland, Yunting Fu, University of Maryland, Richard N. Dalby, University of Maryland. **Objective:** To design and implement a PharmD curriculum that thoroughly integrates basic and clinical sciences in didactic course work, and evaluate its impact on student confidence and attainment of terminal performance outcomes. **Background:** Our 2006 ACPE reaccreditation report spurred curricular revision to move therapeutics earlier than the P3 year to “help students see the relevance of other course material offered in the early years of the program.” The new curriculum’s overarching goal is to incorporate basic science content and examples relevant to pharmacy practice through a multidisciplinary approach to teaching. **Process:** Anatomy/Physiology courses became prerequisites, making room in P1 fall for Principles of Drug Action. In P1 spring, foundations of pathophysiology and pharmacology are integrated with therapeutic concepts. In P2, therapeutics is taught as single disease state modules along with related pathophysiology and pharmacology. In P3, the pharmacotherapeutics of complex and multiple disease states is emphasized. Every semester in abilities labs, students practice clinical activities that correspond to the therapeutic concepts. **Results:** As part of our institutional assessment process, students are given periodic surveys to assess their confidence level to perform tasks anchored in the terminal performance outcomes. This begins with a baseline assessment shortly after admission and subsequent surveys after each introductory pharmacy practice
experience. Implications: Students are academically successful and they are becoming more confident with skills as they proceed through the curriculum. Integrated coursework contributes to a student’s progress toward becoming a competent pharmacy practitioner.

Enhanced Communication Among Basic Science and Clinical Faculty Teaching Infectious Diseases. Eric A. Wombwell, University of Missouri-Kansas City, Jennifer A. Santee, University of Missouri-Kansas City, Brooke Y. Patterson, University of Missouri-Kansas City, David C. Phillips, University of Missouri-Kansas City, Mostafa Badr, University of Missouri-Kansas City. Objective: The purpose of this collaborative endeavor is to ensure students enrolled in the PharmD program at the University of Missouri-Kansas City, School of Pharmacy are provided the information and materials integral to the practice of pharmacy in the knowledge domain of infectious diseases. This philosophy is to improve communication among basic science and clinical faculty towards the aim of better serving educational needs. Methods: Clinical faculty developed a listing of infectious disease-relevant skills that students are expected to possess upon arrival for advanced experiential practice. Both basic science and clinical faculty reviewed the list as a group to provide feedback as to which skills were taught within their respective courses, in an effort to ensure that all listed skills were covered in the curriculum. Clinical faculty provided comments back to basic science faculty on lecture content. Results: Five basic science and seven clinical faculty were active in this endeavor. The listing of knowledge based skills for infectious disease totaled 48. All skills were found to be addressed within at least one course covering the infectious disease spectrum. Feedback provided to basic science faculty included drugs new to clinical practice, drugs no longer used in clinical practice, and lecture material organization. Implications: The adopted process has generated dialogue among basic science and clinical faculty related to how and where content is taught. It is expected that this will improve content provision throughout the curriculum. These findings support the need for a similar approach in other disease states within the curriculum.

Evaluation of Required Research Course in a Pharmacy Curriculum. Debra Parker, The University of Findlay, Jean E. Cunningham, The University of Findlay, Tonya A. Dauterman, The University of Findlay, Lori Ernsthausen, The University of Findlay, Laura Perry, The University of Findlay. According to the 2007 ACPE Standards 2.0, pharmacy curriculum is to include: 1) fundamentals of research design and methodology, 2) principles of evaluation of primary literature and practice application, 3) principles of research design and analysis, and 4) levels of clinical evidence, regulatory and ethical requirements for research. The University of Findlay College of Pharmacy curriculum requires each student to complete a two-hour course based on a research project in the field of pharmacy practice or science. This course requires the student to develop a research project in concert with a member of the College of Pharmacy faculty. The student is to examine any valid pharmacy question and is required to submit his or her research project for poster presentation, podium presentation, or written publication in a professionally recognized venue. This course has been offered three times, to date, with no 1) retrospective review of venues in which final projects have been presented 2) assessment of field (science or practice) in which projects are focused, nor 3) summative student and faculty feedback regarding value and structure of this course. We evaluate this information for the first time. Results: Pending.

Evolution of an Integrated Pharmacotherapy Sequence at the University of Texas College of Pharmacy. Patrick J. Davis, The University of Texas at Austin, Richard E. Wilcox, The University of Texas at Austin, Alan B. Combs, The University of Texas at Austin. The B.S. Pharmacy curriculum at the University of Texas through the 1990’s consisted of a classical, discipline-based set of courses, which separately addressed the basic pharmaceutical and clinical sciences. While there were attempts to coordinate topics across courses, separation of courses across the multiple years of the curriculum, and difficulties for students in terms of integrating content and concepts remained as major challenges. Curriculum redesign associated with the entry level PharmD Program provided us the opportunity to develop an integrated pharmacotherapy sequence across three semesters. Each therapeutic module consisted of the appropriate pathophysiology, medicinal chemistry, pharmacology/toxicology, and therapeutics presented by modular teams of faculty. Facilitated case-based laboratories allowed reinforcement of concepts and team-based design of therapeutic plans. A comprehensive program assessment conducted each semester allowed for monitoring and refinement of the eight courses associated with the integrated pharmacotherapy sequence. In anticipation of implementing our revised (2009) PharmD curriculum, two Task Forces undertook a comprehensive review of the integrated pharmacotherapy sequence to assess redundancies, omissions, and format. One of the challenges of the previous sequence involved students juggling multiple unrelated therapeutic modules, resulting in a focus only on the upcoming modular exam. Thus, a new “immersion” model for pharmacotherapy was implemented in 2010 with a focus on a single module until its completion. Overall, this new structure has been well received by faculty and students. We continue to use the ongoing program assessment (and other instruments) to evaluate outcomes in comparison with the previous model.

Framing the Curriculum: Use of Clinical Application to Integrate Foundational and Clinical Sciences. Pamela U. Joyner, University of North Carolina at Chapel Hill, Adam M. Persky, University of North Carolina at Chapel Hill, Wendy C. Cox, University of North Carolina at Chapel Hill. The UNC Eshelman School of Pharmacy promotes the integration of foundational and clinical sciences throughout the curriculum with a goal of improving efficiencies, reducing redundancies, and improving clinical applicability and learning. Selected foundational science courses were modified to increase clinical applicability based on the School’s Curriculum Committee recommendations or faculty/administration interest. The Committee made a recommendation to eliminate a stand-alone pharmacology course in an effort to reduce course redundancies. As a result, the medicinal chemistry and pharmacotherapy courses underwent integration and alignment, incorporating all relevant pharmacology material into these courses and improving clinical applicability. The Curriculum Committee also reviewed the delivery of physiology with a goal of improving its clinical applicability by incorporating clinical faculty to teach portions of the course in a case-based approach. The pharmacokinetics courses were similarly revised to include case-based, clinical application. When students were asked on course evaluations whether they believed the knowledge and skills developed in the course would be relevant in the future, there were no significant changes in the medicinal chemistry series (pre = 3.19, post = 3.16, p = 0.55), physiology course (pre = 3.34, post = 3.73; p = 0.085), or foundational pharmacokinetics course (pre = 3.54, post = 3.60, p = 0.46) before and after course changes. Even though student evaluations of courses revealed no significant differences, changes in course content and delivery increased communication among faculty, reduced redundancies, and improved clinical applicability. These changes also have the potential to increase student learning by increasing content relevancy and the use of learning-centered
approaches. Future work will focus on increasing clinical relevance and assessing its impact.

From Classroom to Clinical and Beyond. Barbara D. Smith, University of Charleston, Michelle L. Herdman, University of Charleston, Sandra S. Bowles, University of Charleston. The University of Charleston School of Pharmacy (UCSOP) is a newly accredited school of pharmacy that graduated its inaugural class in May 2010. The original curriculum was based on a module system, but the school moved to a more traditional sequential curriculum in the 2009-2010 school year. The current P3 students are the first group to go through the new curriculum, which mainly affected the P2 and P3 years. Objectives The purpose of this study is to determine if—after the curricular change—students are integrating and applying their P1 and P2 basic science knowledge, clinical and communication skills to their experiential education activities in the P3 year. Methods As a model to determine integration, we will use representative didactic courses from the P1 and P2 years to determine if students are applying knowledge and skills learned in these courses to their 3rd year IPPE. The third year experiential course is based in a rural hospital in Spencer, West Virginia—a medically underserved community. The course focuses on outpatient diabetes management and community outreach. We will survey the students and patients, analyze syllabi and conduct direct observations. Results Results will be available at the conclusion of the 2011 spring semester. Implications: This study will help to determine if the curriculum is preparing the student pharmacists for successful patient interactions during a P3 IPPE. As a result, UCSOP will be better able to determine strengths and weaknesses to make curricular adjustments, where necessary, to increase student success.

ICLB: A Team-based Curricular Integration Project. Lisa M. Michener, Rosalind Franklin University, Scott D. Hanes, Rosalind Franklin University, Marc S. Abel, Rosalind Franklin University, Jolee Rosenkranz, Rosalind Franklin University, Kevin O. Rynn, Rosalind Franklin University, Sarah S. Garber, Rosalind Franklin University, Sekhar Mamidi, Rosalind Franklin University, Gloria E. Meredith, Rosalind Franklin University. The Introductory Collaborative Learning Bridge (ICLB) Project is a longitudinal component of the P1-P3 Introductory Pharmacy Practice Experiences (IPPE). The project is an active, team-based exercise that bridges basic knowledge gained in P1 to application in P2, and additional practical emphasis in P3. Students devote five contact hours in each of the P1 and P2 years, and an additional ten hours during the P3 year toward the project. The hours span the entirety of each year. Teams of five pharmacy students receive a structured project outline with objectives and specific assignments for the academic year. Each project centers on a specific drug or therapeutic class, and assignments increase in depth and complexity during the P1-P3 years (vertical integration). The role of each team member is specified. The ICLB project comprises a range of basic science and clinical components, as well as reflections (individual, small-group and large-group), presentations, and an introduction to research concepts. Assigned activities actively bridge basic science and clinical objectives during IPPEs. Within each year, students map the occurrence of their assigned drug or class to basic science courses and clinical experiences (horizontal integration). All groups present their project at a school-wide poster session at the end of the year. Assessment of each group includes faculty, peer and team review at regular intervals, including the quality of presentations, curricular mapping and reflection statements. Student progress in ICLB is graded annually as a component of the Spring quarter IPPE.

Implementation and Assessments of an Integrated Pharmacotherapy Course. Ivy O. Chui-Poon, Texas Southern University, Golda Anne K. Leonard, Texas Southern University, Adebayo O. Oyekan, Texas Southern University, Inyang N. Osemene, Texas Southern University, Brian Dupré, Texas Southern University. The seven newly implemented system-based Pharmacotherapy courses integrate clinical and basic science information, form the rigorous core of semesters 4-6 of the professional curriculum, and are augmented by an active learning Skills Laboratory. The success in “Pharmacotherapy II: Cardiovascular and Urinary System Disorders” is built on three guiding principles: successful teamwork, clinical cases, and meticulous organization with underlying flexibility. The course coordinator(s) assume responsibility for administration, but all members of the team pledge participation, enthusiasm, and shared responsibility for successful course execution. The team met weekly to develop the syllabus, integrate the disciplines, and agree on core diseases. A teaching plan was developed for each module and included a case adapted from the textbook with a list of drugs to be covered. A short case was written for the exam and faculty from each discipline wrote related questions for a portion of the exam. Ideally, members attended each other’s lectures. When impractical, the team was cognizant of lecture content from teaching plans, Blackboard posts and textbook/reading assignments. In the skills laboratory, students learn to gather, evaluate and apply pharmacotherapy concepts and guidelines to develop patient-centered care plans using the same disease states taught in the lecture. Again, successful communication among the courses proved imperative. The integrated courses will be assessed using the following criteria: (1) 85% students master the student learning objectives (measured by both written exams and OSCEs) (2) positive student evaluations, and (4) successful student performance in future experiential, didactic, clinical skills, critical thinking skills, and licensure examinations.

Implementation, Evolution and Impact of an Integrated Pharmacy Applications (IPA) Examination. Bruce H. Livengood, Duquesne University, Patricia A. Keys, Duquesne University, Marc W. Harrold, Duquesne University, Thomas L. Rihn, Duquesne University, Marsha Mcfalls, Duquesne University, Christine K. O’Neil, Duquesne University, Autumn L. Stewart, Duquesne University. Students have difficulty with horizontal and longitudinal integration of course material for problem solving. DUSOP has been exploring different methods of evaluating and improving problem solving performance. Individual, oral examinations that evaluate knowledge and skills in two concurrent BMS&T courses were adopted as the assessment model in 2009. A standardized rubric providing balance between the science and clinical skills was developed for each exam. The rubric includes a patient case, basic science questions, a pharmaceutical calculations question, and an impromptu patient counseling question applicable to the case. In addition, students are required to develop a pharmacy care plan for each problem. Each student is given one hour to prepare using any available resources and then presents the results orally to teams of two evaluators representing interdisciplinary faculty, graduate students and practitioners. A detailed rubric was created by the exam development team for the purposes of maximizing inter-rater reliability. The student receives a summary sheet that provides feedback on their performance in each component of the exam. The score on each student’s exam counts as 10% of their final grade in each of the BMS&T courses. A separate “Gateway” exam is administered at the end of the PYIII year and the student must score 70% or better in order to proceed into the APPEs. The results and data obtained from these exams have been instrumental in guiding a major curricular revision by DUSOP. Future plans include integrating these exercises into laboratory experiences and small group instruction.

Incorporation of Top 200 Rx drugs into a Basic Sciences Course for First-year Pharmacy Students. Craig A.H. Richard, Shenandoah University, Jennifer E. Bryant, Shenandoah University. Top 200 Rx
drugs were incorporated into a first year basic sciences course in order to integrate more clinical application relevant to pharmacy students. This is a two-semester course taken by first year pharmacy students that contains the integrated content of biochemistry, cell biology, anatomy, physiology, and pathophysiology. The Top 200 drugs with basic pharmacology were added to the appropriate pathophysiology sections. First year students were surveyed about their perceived general knowledge of pharmacology and the Top 200 drugs at the start and end of this course. Data was gathered from three different classes of students and the results are an average of their responses. At the start of the course, 45 percent of the students responded that they had little to no knowledge level of the Top 200 drugs. After completing the course, 22 percent of students indicated that they had little to no knowledge about the Top 200 drugs. Students were again polled in their second and third professional years and asked what changes could be made to this basic sciences course in order to better prepare them for their therapeutics courses. The most common response from students was to incorporate even more drugs and pharmacology. This supports that the incorporation of the Top 200 drugs and basic pharmacology into a basic sciences course for first year pharmacy students was helpful to their future courses and that integrating even more pharmacology of the Top 200 drugs into this course would be additionally beneficial.

Incremental Development of an Integrated Assessment Method for the Professional Curriculum. Melissa S. Medina, The University of Oklahoma, Mark L. Britton, The University of Oklahoma, Nancy A. Letassy, The University of Oklahoma, Vincent C. Dennis, The University of Oklahoma, Mark A. Stratton, The University of Oklahoma, Ann E. Lloyd, The University of Oklahoma, Michael McShan, The University of Oklahoma, Donald L. Harrison, The University of Oklahoma, Alice E. Kirkpatrick, The University of Oklahoma, Nancy E. Ray, The University of Oklahoma, Shannan D. Wideman, The University of Oklahoma, Ryan Webb, The University of Oklahoma, JoLaine R. Draugalis, The University of Oklahoma. ACPE Standard 13 requires programs to integrate, apply, reinforce and advance knowledge, skills and attitudes throughout the curriculum. This requirement motivated our use of bi-annual integrated knowledge and skills examinations embedded into final examinations of the pharmacy practice courses offered in each semester of the first three professional years. A P1 integrated exam (IE) committee was formed in 2008, followed by similar committees in 2009 and 2010 for the P-2 and P-3 years, respectively. Committees consist of course coordinators within each professional year in addition to assessment and curriculum committee members. Every semester, the IE committee responsible for each professional year: 1.Identifies the most pertinent skills and knowledge-based content from each course offered during their respective semester, 2.Develops measurable IE objectives addressing the pertinent content, 3.Creates or revises multiple-choice and performance-based IE questions derived from IE objectives, accounting for 10% of the final course grade, and 4.Sends objectives and exam questions for review and revision by the IE review committee composed of curriculum and assessment committee members. After each semester’s exams, an additional review committee evaluates student performance on each question, revising the objectives and questions as needed for the next year’s iteration. This process has effectively engaged many faculty members in the complexities of developing, administering, and assessing student performance across the professional curriculum. As well, this assessment process has transformed student understanding of the depth of learning and retention expected within the professional curriculum and for practice.


Integrating Basic and Clinical Sciences Education - Curricular Revision at the South Carolina College of Pharmacy. Kelly R. Ragucci, South Carolina College of Pharmacy, Edward E. Solis, South Carolina College of Pharmacy, Wayne E. Buff, South Carolina College of Pharmacy, James M. Chapman, South Carolina College of Pharmacy. The South Carolina College of Pharmacy (SCCP) faculty voted unanimously in favor of a revised curriculum for the doctorate of pharmacy program which will go into effect Fall 2011. This revision accomplished the following: 1) establishment of a Foundations course in the first year of the program in order to teach pharmaceutical and biomedical sciences concepts with respect to their relevance and application to basic and clinical science problems; 2) movement of Pharmaceutical Chemistry/Pharmacogenomics (PC/PGx), previously Medicinal Chemistry, entirely to the first year; 3) modification and delivery of Dosage Forms and Drug Delivery Systems, previously Pharmaceutics, as a one-semester course in spring of the first year; 4) integration of Pharmacology, Pathophysiology and Pharmacotherapy into a four-semester sequence during the second and third years; 5) incorporation of an interprofessional course within the spring semester of the first year. This new curriculum will enable the faculty to streamline content and reduce redundancies throughout the curriculum, increase active learning and use of case-based teaching in the classroom and improve communication between departments. Presenting the course curriculum in a more integrated manner encourages students to apply information and skills from a variety of domains and better understand how biological, pharmaceutical and clinical sciences fit together. In addition, these changes will enable us to continue to evolve and meet Accreditation Council for Pharmacy Education (ACPE) recommendations. The faculty is currently critically evaluating courses/lectures and identifying opportunities for new content and different approaches to delivery.

Integrating Basic and Clinical Sciences Education through Faculty Collaboration in Course Development and Delivery. L. Clifton Fuhrman, Presbyterian College, Laura M. Fox, Presbyterian College, Julie M. Sease, Presbyterian College. The Pharm.D. curriculum at Presbyterian College School of Pharmacy integrates basic and clinical science education within the context of pharmacy practice. To ensure integration between courses as well as the relevancy of presented material, faculty of Pharmaceutical and Administrative Sciences and Pharmacy Practice departments collaborate in the development of all course syllabi. The first three semesters of the program provide students with foundational principles in biomedical and pharmaceutical sciences. Faculty collaboration has facilitated the development of courses, lectures, and laboratories that bring basic science and clinical science together in ways applicable to current practice. An intensely integrated course sequence, Medication Therapy Management (MTM), has been developed and will be taught in the P2 and P3 year by faculty from both departments. This 14-course sequence (30 credit hours) combines pathophysiology, pharmacotherapy, pharmacology, medicinal chemistry, and pharmacokinetics in a comprehensive systems-based approach for learning. In conjunction with the MTM sequence, a MTM case study course and Practice Integrated Laboratory Sequence provide further integration of basic and clinical sciences education. Active learning methodologies will be used to reinforce the educational process and integration of the sciences with pharmacy practice throughout the curriculum. The development of case studies and simulations of drug protocols using human mannequins by practice and science faculty will allow for further interdisciplinary education and faculty interaction. Collaborative interaction between faculty in their educational roles is emphasized in order to optimize student learning and the ability of students to apply what they have learned to pharmacy practice.
Integrating Basic and Clinical Sciences Education: From Philosophy & Process to Implementation & Assessment. Victoria F. Roche, Creighton University, Samuel C. Augustine, Creighton University, Aimee L. Limpach, Creighton University, Naser Z. Alsharif, Creighton University, Edward M. DeSimone, Creighton University, Amy Friedman Wilson, Creighton University, April N. Puhl, Creighton University. Philosophy: In 2005 the Creighton pharmacy faculty initiated a curricular revision process that focused on contemporary practice and committed to a fully integrated approach to professional education. Process: A Curriculum Revision Committee (CRC) developed a set of Guiding Principles and facilitated faculty approval of new Educational Outcomes that reflected a faculty-endorsed Introduce/Reinforce/Demonstrate (IRD) curricular model. A Curriculum Implementation Committee (CIC), formed in 2009 after faculty approval of a new curriculum skeleton, oversees ongoing curricular development. The pharmacy faculty and School of Medicine colleagues teaching in the pharmacy program have been continuously engaged through interdisciplinary focus groups and town hall meetings. Implementation: The new curriculum was launched in 2010. Purposeful content integration is facilitated by a Skills Laboratory that spans the six didactic semesters of the curriculum. Faculty from pharmacy sciences, pharmacy practice, and medicine departments work collaboratively to reinforce concepts covered in didactic classrooms using an active learning pedagogy. The faculty also communicates regularly across didactic courses to ensure that the scientific foundation of practice and the therapeutic relevance of science are explicitly conveyed. Integration challenges, encountered primarily when working across departments, are being addressed. Assessment: The CIC is monitoring horizontal and vertical integration by mapping the breadth and depth of content emphasis to the educational outcomes. A curricular assessment plan has recently been initiated and will be optimized as the curriculum unfolds. Using a dynamic curricular improvement process, learning experiences are being continuously fine-tuned to enhance desired outcomes, including integration, in response to formative student and faculty evaluations.

Integrating Clinical and Basic Sciences throughout a Curriculum. Cynthia K. Kirkwood, Virginia Commonwealth University, Veronica P. Shuford, Virginia Commonwealth University, Jeffrey C. Delafuente, Virginia Commonwealth University. During our curricular revision process the faculty agreed to increase the amount of cross-discipline integration. Previously we had some integration in a few courses. Our new curriculum has a 2-year modular clinical therapeutics sequence that integrates clinical therapeutics with pharmacology, pharmacoeconomics, and medicinal chemistry, eliminating four standalone courses for these disciplines; other integrated courses were developed. A majority of respondents to a faculty survey believe that integration is working well in the clinical therapeutics modules, but most respondents were unable to comment on other integrated courses. Integrating interdisciplinary content has increased communications between departments, decreased content redundancy, and enhanced the relevancy of the contribution of each discipline to patient care. 39% of faculty respondents deemed students are better able to understand the importance of the basic sciences to pharmacy practice, but 46% offered no opinion. Our successes include philosophical agreement from all departments and increased collegial interactions. Faculty worked diligently to coordinate course material and teaching. Our survey indicated we need to improve dialog among the faculty about the effectiveness of integration. We still have challenges (i.e., improving application of knowledge across disciplines, and faculty relinquishing previously taught material in favor of new, more applicable content). The clinical therapeutics module exams could also be improved by integrating all disciplines into case assessments, as opposed to each discipline writing specific questions. Another opportunity for improvement is to reduce the amount of individual faculty members who teach material separately, with a goal to move to more integrated classroom teaching.

Integrating Pharmacology and Pathophysiology/Therapeutics Courses to Achieve Curricular Improvement. Katherine A. Kelley, The Ohio State University, James D. Coyle, The Ohio State University, Kari R. Hoyt, The Ohio State University, Stuart J. Beatty, The Ohio State University. The process of analyzing curricular content maps led the curriculum and assessment committee to seek ways to improve the PharmD didactic curriculum. Specifically, the committee wished to address gaps by eliminating redundancy. The maps revealed significant overlaps of content between the six-quarter sequences in pharmacology and pathophysiology/therapeutics. The process of aligning the content of these two course sequences and organizing them by disease state eliminated redundancy and yielded recovered time in the curriculum. This extra time was used to deliver missing content and to add a five-week capstone at the end of the six courses. To date two cohorts of students have completed the six-quarter sequence. The impacts on student learning and faculty workload will be presented, and student and faculty perceptions of this curricular change will be highlighted.

Integrating Science and Practice in the Pharmacotherapy of Cardiovascular Disease. Amy L. Seybert, University of Pittsburgh, Regis R. Vollmer, University of Pittsburgh. Our curriculum is designed to maximize the integration of basic and clinical sciences throughout the four professional years. Disease- (system) based courses of common design, referred to as therapeutic modules form the core of the curriculum. Courses during the first two terms (P1 year) provide the foundation for basic pharmaceutical sciences and principles of patient care practice. The basic/clinical science foundation prerequisites are translated and expanded within therapeutic modules. A common course design is followed in each module ensuring the integration of basic and clinical science. This design is exemplified by the course titled, Pharmacotherapy of Cardiovascular Disease. Two course coordinators, a basic scientist and clinician oversee and teach throughout the course. The course is subdivided into segments for each major cardiovascular disease entity: hypertension, hyperlipidemia, etc. For each disease state a systematic progression is followed: physiology, pathophysiology, pharmacology, pharmacotherapy and clinical simulation. Real life clinical scenarios are incorporated for each disease using School of Pharmacy simulation mannequins and the Peter M. Winter Institute for Simulation Education and Research (WISER). Assessment is accomplished with multiple summative and formative assessment tools. Simulation reinforces basic pharmaceutical science concepts and clinical practice. Benefits of this practical experience are seen in knowledge improvement, clinical performance, advanced decision-making skills, and increased student confidence. Pharmacy residents are engaged in various aspects of the course, from didactic to facilitation of simulation cases. This course is one of the cornerstone courses in the curriculum, laying the foundation for future courses and experiential learning opportunities.

Integrating an Interdepartmental Case-Based Approach into the Second-Year Cardiovascular Module of an Accelerated PharmD Curriculum. Kimberly A. Pesaturo, Massachusetts College of Pharmacy and Health Sciences-Worcester, Courtney L. Jarvis, Massachusetts College of Pharmacy and Health Sciences-Worcester, Jennifer L.
Donovan, Massachusetts College of Pharmacy and Health Sciences-Worcester, Alice J.A. Gardner, Massachusetts College of Pharmacy and Health Sciences-Worcester, Matthew A. Silva, Massachusetts College of Pharmacy and Health Sciences-Worcester, Abir Kanaan, Massachusetts College of Pharmacy and Health Sciences-Worcester, Paul P. Belliveau, Massachusetts College of Pharmacy and Health Sciences-Worcester, Anna K. Morin, Massachusetts College of Pharmacy and Health Sciences-Worcester, Michael J. Malloy, Massachusetts College of Pharmacy and Health Sciences-Worcester. The Massachusetts College of Pharmacy and Health Sciences (MCPHS) School of Pharmacy - Worcester/Manchester employs 29 pharmacy practice and 11 pharmaceutical sciences faculty members. Both departments and the Dean are committed to fostering student academic success throughout the PharmD curriculum in part through collaborative interdepartmental teaching. The purpose of this presentation is to illustrate scenarios that highlight pharmacy practice and pharmaceutical sciences integration throughout the cardiovascular modules taught in the second year of our 34-month program. To integrate sequential case-based teaching in basic science and clinical didactic courses, teaching materials including patient cases were developed that linked two core courses. Specifically, cardiology-based patient cases were created and discussed from multiple perspectives in the Pharmacology and Pharmacotherapeutics core courses. In one example of this approach, basic science and clinical pharmacy practice faculty members assessed course objectives in two cardiovascular topics (hyperlipidemia and acute coronary syndromes) to implement changes in a required cardiovascular module that spanned both courses. Case-studies, tutorials, in-class quiz and exam questions were developed that mutually reinforced key concepts common to both subject areas. As a second example of the integrated approach, interdepartmental faculty collaboration was achieved in a similar manner with additional cardiovascular topics (arrhythmias and anticoagulation). Here, clinical scenarios bridged core courses, and teaching materials were shared among participating faculty members. Interdepartmental approaches shared among faculty members may to translate into other therapeutic areas in the curriculum. Additionally, this shared collaboration paves the way for future faculty collaboration to enhance student success.

Integrating Basic and Clinical Science Knowledge and Skills Through Two Multi-Year Course Sequences. Mitchell R. Emerson, Midwestern University’s College of Pharmacy-Glendale, Erin C. Raney, Midwestern University’s College of Pharmacy-Glendale, Stephanie J. Counts, Midwestern University’s College of Pharmacy-Glendale, Tara Storjohann, Midwestern University’s College of Pharmacy-Glendale, Lynn R. Patton, Midwestern University’s College of Pharmacy-Glendale. Midwestern University College of Pharmacy-Glendale has fully implemented its revised curriculum in its three calendar-year accelerated program. The curriculum integrates foundational scientific knowledge with the clinical skills required for successful pharmacy practice. At the core are two multi-year course sequences that interrelate and reinforce these aspects of pharmacy education. The Integrated Sequence (IS) is a series of nine modules that incorporates the principles of pathophysiology, pharmacology, medicinal chemistry, and pharmacotherapeutics utilizing an organ system, disease state-based approach. Over five didactic quarters, IS establishes fundamental knowledge necessary for creating appropriate patient treatment plans through guided discussion and case-based questioning. The eight didactic quarter Professional Skills Development (PSD) sequence, co-requisite with and bracketing IS, builds upon this knowledge base and engages students to develop skills needed to fulfill the professional responsibilities to provide patient-centered care. Quarters one through four of PSD place emphasis on general facets such as self-care, communication skills, SOAP notes, and basic drug information retrieval and recommendations, while quarters five through eight focus on advanced skills utilizing case studies and professional verbal and written communication. Standardized patients are used in all didactic quarters. Integrated, multi-station Objective Structured Clinical Exams conclude quarters four and eight, preceding introductory and advanced pharmacy practice experiences, respectively, to allow for capstone assessment of the knowledge and skills learned. Initial assessments suggest that students recognized and found beneficial the interrelatedness of these course sequences and felt confident in achieving the requisite competencies for future pharmacy practice.

Integrating the Basic and Clinical Sciences in Small-Group, Clinical/Pharmacology Case-Solving Sessions. Lindsay A. Schwarz, University of Houston, Doug Eikenburg, University of Houston. The first two years of our curriculum is rich in basic sciences. Often, pharmacy students do not see a connection between these basic sciences and the clinical role they wish to assume in the future. To help bridge this gap, we have developed small group, case-solving sessions as part of our basic science courses. These cases introduce relevant clinical problems and supplement didactic material introduced in the lecture. These sessions also support the general abilities each pharmacy student should develop throughout the course of study within the college. These abilities include critical thinking, peer teaching and organized oral presentations. Using a variety of references, resources and the lecture material, students use prior knowledge and critical thinking to list all of the potential therapeutics, discuss how these drug agents alter basic physiology and select the best therapeutic(s) that might resolve the patient’s clinical problem. For example, most students find the units on the cardiovascular therapeutics to be challenging. Three cases, designed to highlight a different cardiovascular clinical problem that is typically resolved by pharmacological therapeutics, are distributed to the students. After a period of small group research, a student from each small group presents their case to the class, discussing the pharmacological therapeutic(s) chosen and rationale for this choice. The instructors of this curricular unit and student audience have an opportunity to comment or ask questions. These “skills” sessions create more interaction between faculty and students and promote active learning while applying pharmacology to a clinical situation.

Integrating the Basic and Clinical Sciences in a Traditionally-Structured Curriculum. Linda G. Martin, University of Wyoming, Kathleen Thompson, University of Wyoming, Whitney A. Buckley, University of Wyoming, Cara A. Harshberger, University of Wyoming, Michelle L. Hilaire, University of Wyoming, Jaime R. Bobbinkyer-Hornecker, University of Wyoming, Carol J. Kobulnicky, University of Wyoming, Janelle L. Krueger, University of Wyoming, Amy L. Stump, University of Wyoming, Suzanne Clark, University of Wyoming. Structure: The University of Wyoming School of Pharmacy has a traditional structure to its curriculum. Courses within each discipline stand alone and many are taught by single instructors. This structure has many advantages, but also has the potential for creating a disconnect between the basic and clinical sciences. Initiatives: In an attempt to integrate the sciences, two curriculum-wide programs include a faculty development initiative for active learning concepts and the implementation of a standardized problem-solving methodology throughout the curriculum. Several targeted efforts include introduction of clinical case presentations in the pathophysiology course, reflection related to how basic science content is used in the IPPE.
rotations, coordinating the drug categories being taught in the basic science courses with the therapeutics, communication and drug literature courses. A standardized journal club rubric used in the APPE rotations was introduced in the drug literature course this year as was the electronic portfolio. Cases involving basic science concepts are used to assess the drug information and literature evaluation skills of the students. Clinical concepts are incorporated into the content of the basic science courses through cases and discussion. Faculty attending lectures or detailed consulting on the lecture content assures that the appropriate background material is being covered in the basic science courses; this level of coordination is not fully implemented. 

Assessment: Assessment of the effectiveness of these techniques is done through the student reflections and achievement of objectives in the various courses.

Integration by Design: Basic Sciences and Practice Faculty Working Together as One. Rajesh Vadlapatla, Saint Joseph College, Bruce Edgren, Saint Joseph College, James G. Henkel, Saint Joseph College, Joseph R. Ofou, Saint Joseph College. Objectives: The objective is to thoroughly integrate basic and clinical sciences in our modified block-style program. Methods: The Saint Joseph College School of Pharmacy utilizes a collaborative instructional model. To better prepare the students and to add relevance to the lesson plans in the foundational (basic) sciences, a practice faculty member and the sciences course director utilize “clinical hooks” (simplified case studies) that will be presented by the appropriate practice faculty member. In the second professional year, with case-based pathophysiology and disease treatment dominating the curriculum, sciences faculty will “kick off” many of the discussions with a brief reminder of key concepts that have relevance in the upcoming topic. By design, our faculty physical office space alternates practice and sciences throughout two hallways. This method of office assignment allows for maximal informal and formal contact. Our mentoring programs begin with an assigned key contact within faculty to assist new faculty with curriculum and pedagogical development. In some cases those key contacts for practice faculty will lie within the sciences and vice versa. We anticipate these informal relationships will develop into formal mentoring. Results: By this design we have seen successful integrated curriculum development, an atmosphere of collaboration and positive scholastic development. Implications: Our approach has been successful to date in eliminating discipline-based friction and providing a productive atmosphere for integrative pursuits. Schools and colleges of pharmacy and other professional programs may benefit from some of these techniques.

Integration of Basic and Clinical Sciences in the Professional Curriculum: Focus on Student Competence. Michael Z. Wincor, University of Southern California, Ronald L. Alkana, University of Southern California, Kathleen H. Besinque, University of Southern California. Purpose: The objectives of this aspect of curriculum revision were: 1) to develop and introduce an integrated, interdisciplinary series of courses, incorporating medicinal chemistry, pharmacology, pharmacokinetics and clinical therapeutics for students in the second and third years of the PharmD program, 2) to develop a structure to facilitate team-based interdisciplinary instruction, and 3) to develop a means of assessing student readiness for advanced pharmacy practice experiences. Methods: Two coordinators (basic and clinical sciences) organize each of eleven modules, with the final module serving as a review and capstone, including an OSCE. An Inter-Module Coordinating Council (IMCC), composed of all coordinators plus student representatives, meets regularly to maintain communication across modules, to establish reasonably consistent course policies, to reduce unintended duplication, and to insure that important areas are not overlooked. Pharmacy residents lead weekly small group case conferences related to key therapeutic areas. Evaluation of the modules has been multi-modal. Results: Team-based teaching has significantly reduced unnecessary duplication of instructional material. The capstone, in addition to assessing student readiness, provides feedback for future curricular improvements. Student evaluations and feedback from clerkship faculty have been positive. Conclusions: With sufficient planning, cooperation, coordination, and effort on the part of both faculty and students, basic and clinical sciences can be successfully integrated into therapeutics modules. An intensive (10-15 hours/week) instructional model has been tested and judged to be successful. Additional faculty and staff resources have been required to support this approach.

Integration of Basic and Clinical Sciences: A Model for Leveraging Pharmacy Curricular Content. Bianca B. Calderon, Regis University, S. Dean Allison, Regis University, Stephen W. Luckey, Regis University, David R. Clark, Regis University. One of the major challenges in pharmacy education is connecting basic sciences to clinical practice. In most standard curricula, basic pharmaceutical and biomedical sciences are presented in individual courses during the first two years, and pharmacotherapeutics is covered during the third year. A potential weakness of this process is low retention of basic science concepts that results in lost opportunities to apply these concepts to clinical practice. The pharmacy curriculum at Regis University integrates the basic, pharmaceutical, and clinical sciences throughout all three years of didactic course work as well as during the Introductory Pharmacy Practice Experiences. The integrated curriculum is built around a three-year, disease state-based integrated pharmacotherapy course track. In support of this course, pharmacy skills, systems, service learning, public health, and experiential course tracks are taught concurrently. Integration is accomplished on two levels within the curriculum, including (1) presentation of basic and clinical sciences in the integrated pharmacotherapy courses, and (2) presentation of complementary aspects of the disease state topic sequence simultaneously across other course tracks. Both levels of integration require the pharmaceutical science and pharmacy practice faculty members to develop course materials in a collaborative manner. Curricular mapping is performed to ensure adequate coverage of core subjects. Through this curricular model, the potential for students to apply basic science to pharmacy practice is maximized, concepts are reinforced and extended, and the specific educational outcomes of the Regis University School of Pharmacy are met.

Integration of Pharmaceutical and Clinical Sciences in a Pharmacy Skills Lab to Enhance Student Learning. Matthew W. Strum, The University of Mississippi, Michael A. Repka, The University of Mississippi, Alicia S. Bouldin, The University of Mississippi, Soumyajit Majumdar, The University of Mississippi, Ziad\eddin Shariat-Madar, The University of Mississippi, Michael L. Warren, The University of Mississippi, Rachel C. Robinson, The University of Mississippi. As the result of recent assessment and curriculum revisions, a four-semester sequence of Pharmacy Skills Lab was created for first and second year pharmacy students. One primary purpose of the lab is integration of pharmaceutical science content with clinical content to offer students a better overall understanding of how the various concepts are used to optimize patient care. The lab sequence emphasizes active learning for integration and application of curricular content and incremental development of professional and general abilities. Lab topics are linked to the material being taught simultaneously in didactic courses in pharmaceutics, communications, information...
skills, pharmaceutical calculations, pharmacoeconomics, and pharmaco-
ology. Each week, students are provided a 1-hour topic overview and
subsequently attend a 3-hour lab session, where patient cases and prob-
lems are utilized to challenge students to consider drug literature, physical
assessment, scientific principles, dose calculations, communications and
cultural issues, and monitoring issues, among others. Examples of lab
exercises include product preparation (i.e., compounding) and char-
acterization, patient counseling, pharmacokinetic calculations, drug
monograph writing, and decision-making for populations such as phar-
macy and therapeutic committee formulary choices. Students practice
these skills in the context of a bigger picture, whether with typical or
atypical patients or in population-based examples. Student performance
is evaluated both formatively and summatively, using OSCEs as well as
written quizzes and exams, to assess their understanding of the material
presented and to provide feedback for continuous improvement of their
developing professional abilities. Course-embedded assessment com-
ponents are also utilized as part of the school’s programmatic assessment
portfolio.

Integration of Pharmaceutics with Basic and Clinical Sciences. Kenneth L. McCall, University of New England, Srinidi Mohan,
University of New England, Matthew M. Lacroix, University of New
England, Curt R. Cyr, University of New England, John V. Schloss, University of New England, Ronald D. Hills, University
of New England. Goal: The University of New England College of
Pharmacy designed an integrated pharmaceutics laboratory course series
in the first professional year which includes drug analysis, pharma-
cuetics, pharmacy calculations, and pharmacy practice concepts.
Methods: Pharmacy science, pharmacy practice, and adjunct faculty
with compounding pharmacy experience developed an integrated and
contemporary pharmaceutics laboratory course series. The laboratory
courses were designed to integrate and apply the overarching learning
objectives from several didactic courses including Pharmaceutics I
& II, Pharmacy Calculations, Biochemistry and Drug Analysis, and
Introduction to Pharmacy Practice. The domains for these objectives
included Good Laboratory Practice guidelines, pharmacy terminology,
preparation interpretation, nonsterile and sterile dosage formulations,
and pharmacy calculations. Results & Significance: Student evalua-
tions of the pharmaceutics laboratory course, embedded laboratory
course assessments, an annual summative assessment, and a commu-
nity pharmacist preceptor survey revealed positive feedback overall.
However, several areas for improvement were identified and lead to
further course refinement.

Integration of Pharmaceutical and Clinical Sciences at the Feik
School of Pharmacy. Kevin Lord, University of the Incarnate Word,
Jason Cota, University of the Incarnate Word, Helmut B. Gottlieb,
University of the Incarnate Word, William D. Linn, University of the
Incarnate Word, David F. Maize, University of the Incarnate Word,
Marcos Oliveira, University of the Incarnate Word, Eli G. Phillips,
University of the Incarnate Word, Sushma Ramsinghani, University
of the Incarnate Word, Cynthia Villarreal, University of the Incarnate
Word, Amy Witte, University of the Incarnate Word, Arcelia M.
Johnson-Fannin, University of the Incarnate Word. The Feik School
of Pharmacy’s curriculum is centered on the integration of the pharma-
caceutical and clinical sciences. Beginning in the student’s first year,
didactic and laboratory classes are designed to include the clinical
application of pharmaceutical sciences. For example, pulmonary lec-
tures in the Anatomy and Physiology course are planned so that
students incorporate the use of peak flow meters and pulmonary
function tests into their discussion of pulmonary physiology. The
Pharmaceutics course introduces the making of sterile products and
the process of interpreting a prescription. Additionally, Pharmacy
Communications, a clinical science course, designed an integrated
activity where students present a ten minute talk intended for patients.
The presentation is graded on effective communication skills and
application of medical microbiology/immunology content. The Phar-
macotherapeutic courses in the latter years of the curriculum are
completely integrated. Each module has Pharmaceutical Sciences
and Pharmacy Practice faculty participating in each course. This
format allows science faculty to introduce pharmacodynamic and
pharmacokinetic properties of specific agents used in disease man-
age. The practice faculty applies case studies to reinforce pre-
viously taught science material and its appropriate application, while
expanding on the clinical role of the pharmacist. It is encouraged for
all faculty in each course to be present at each lecture and participate
in questions that are specific to their specialty.

MaddoxMatics: An Integration of Basic and Clinical Sciences
through Multidisciplinary Education. William M. Moore, Campbell
University, William J. Taylor, Campbell University, Wesley D. Rich,
Campbell University, Kimberly J. Dunn, Campbell University, Brenda
Blackman, Campbell University, Ronald W. Maddox, Campbell Uni-
versity. Campbell University entered pharmacy education 25 years ago
with the development of a Doctor of Pharmacy program. This corner-
stone program provided an excellent foundation for the evolution of the
one-dimensional School of Pharmacy into a College of Pharmacy &
Health Sciences offering undergraduate and graduate programs in the
disciplines of pharmaceutical sciences, clinical research and a new
Physician Assistant program. The foundation of the Doctor of Phar-
macy program led the University to provide additional educational
opportunities in the health sciences. To better prepare undergraduate
students regarding the opportunities offered by a pharmacy education
and career, a Pre-Pharmacy Seminar was developed as a freshman
experience course. The course has provided an important segue from
high school sciences to the entry of an integrated body of knowledge of
the basic and clinical sciences. Further integration of the basic sciences
and clinical sciences has been achieved through the development of the
joint degree programs for Doctor of Pharmacy students. These
PharmD/MS pathways in pharmaceutical sciences (PharmD/MS) and
clinical research (PharmD/MSCR) allow students to broaden their
research skills while receiving their clinical education. Students may
specialize their education by choosing paths in pharmacology, pharma-
cuetical analysis, industrial pharmacy, biotechnology, regulatory
affairs, public health and clinical trials administration. The College
has also developed post-graduate training opportunities, clinical resi-
dencies and research fellowships, to provide professional graduates
additional training and opportunities to hone their skills. Campbell
University has embraced the ever changing environment in the educa-
tion of pharmacy and health sciences professionals.

Meeting Market Needs: Curricular Concentration Requirement
to Broaden Student Career Prospects. Eric H. Hobson, Belmont
University, Philip E. Johnston, Belmont University, Andrew A. Web-
ster, Belmont University, Condit F. Steil, Belmont University. Phar-
macy is a diversifying practice community, and Nashville, TN serves
as a powerful example of national trends in emerging pharmacy and
health care opportunities. The Belmont University School of Phar-
macy (BUSOP) is working to meet defined and emerging market
needs by embedding a thirty semester hour curricular concentration
requirement into its Doctor of Pharmacy program. BUSOP offers its
students five practice areas within which to concentrate their elective
courses (didactic & experiential): Information Management, Interdis-
ciplinary Care Delivery, Management, Missions/Public Health, and
Pharmacotherapy. These areas were identified through focus groups with Nashville health care practitioners, corporate and civic leaders, and verified by regional practitioners. This curricular concentration program mixes 12 credits of classroom electives (6 X 2 cr.), an IPPE elective (2 cr.), and four APPE electives (4 X 4 cr.), from which students must complete a minimum of 18 cr. “in concentration” (classroom electives, 8 cr. minimum; IPPE 4, 2 cr.; and, APPE, 8 cr. minimum). Each concentration is defined and elective courses are mapped to concentrations. Currently, 50 electives have been approved, with others in the approval pipeline; most have been offered at least once in the past two years. Student concentration selection patterns are matching our year-to-year initial projections, as greater numbers of students recognize the opportunities available with training in management, information technology, and public health. Commitment to this ambitious program brings with it exciting opportunities, unique partnerships, and planning challenges.

Methods to Integrate and Assess Curricular Themes at the University of Washington School of Pharmacy. Nanci L. Murphy, University of Washington, Peggy S. Odegard, University of Washington. The University of Washington School of Pharmacy’s Curriculum Committee employs curricular thread working groups to ensure integration and assessment of topic areas that are cross-cutting in scope. Goals of these working groups include: reviewing course sequencing and topic development, addressing potential gaps or unnecessary overlap identified by the curriculum map, and providing recommendations that ensure our students’ progressing ability to transfer learning into new and more complex situations. The working groups are composed of faculty involved in teaching pharmacy practice and the basic sciences, students, and practitioners who are content experts in the subject area. A description of this process will be provided drawing upon the geriatric pharmacy content thread as an example.

Pharmacotherapeutic Problem Solving at Wayne State University: An Integrated Approach. Richard L. Slaughter, Wayne State University, Denise H. Rhoney, Wayne State University. Since 1992 Wayne State University has incorporated the disciplines of pharmacology, medicinal chemistry and therapeutics in a disease state modular approach. The current version spans 8 modules over the P2 and P3 year of the curriculum. Each module is 7 weeks in duration with module coordinators evenly distributed between faculty from the departments of Pharmacy Practice and Pharmaceutical Sciences. Each module has imbedded a student problem based learning component which we designate as Pharmacotherapeutic Problem Solving (PPS). Students are assigned into groups of about 15 and a facilitator assigned to each group on a semester basis. A minimum of 2 case scenarios are evaluated in each module (except the final module which has students evaluate 4 cases). A total of 20% of the student’s final grade in each module is derived from written assessment questions generated from PPS material and from peer assessments and facilitator assessment of student performance (faculty of pharmacy approved requirement). This program requires 24 facilitators each year and a coordinator to manage scheduling and coordination of assessment data with module course coordinators for grade determination. PPS requires close communication with faculty in the departments of Pharmacy Practice and Pharmaceutical Sciences. This poster will address challenges we have had in delivering PPS. These include faculty buy-in, faculty participation in case development, integration of basic and clinical sciences in case objectives, consistency in faculty evaluation of student performance, faculty workload and reward. Assessment data will be shared focusing on departmental differences in facilitation.

Pharmacy and Veterinary Pharmacy Education—Facts. Julie A. Adrian, University of Hawaii at Hilo. Tam Vu, University of Hawaii at Hilo. Abstract: It is a common knowledge among economists that during recessions, enrollments in higher education increase, partly due to the unemployed workers who see the need of retraining themselves so that they can increase their chances of getting jobs, partly due to increase in financial aids from the governments, who aims to invest in human capital for long term economic growth. This poster compares and contrasts the patterns of enrollments in pharmacy and veterinary pharmacy schools to the general pattern of enrollments in other medicine schools. Using several data sets on real GDP per capita, number of enrollments in pharmacy, veterinary pharmacy, and other medicine schools during 1960-2000, it finds that there are autocorrelation problems, so generalized least squares estimations are used. In contrasts to the aforementioned belief, the poster finds that enrollments in pharmacy and veterinary schools are pro-cyclical whereas enrollments in other medicine schools are neutral to the fluctuation in real GDP per capita. The authors also project the data up to 2009 and re-estimate the model. The results are robust to the new sample sizes. The poster also analyzes policy implications for general universities that have pharmacy, veterinary pharmacy, or medical schools to sketch a future plan of action.

Putting the Pieces Together: Integrating Basic and Clinical Sciences Education. Amy R. Donaldson, Auburn University, Erika L. Kleppinger, Auburn University, Sharon McDonough, Auburn University, Rajesh Amin, Auburn University. The Harrison School of Pharmacy has developed an integrated professional curriculum that melds the basic and clinical sciences from day one of the first professional year. The integration of our curriculum can be illustrated by highlighting how content is aligned across courses so that students learn to address major health issues relevant in Alabama through (1) information taught in the basic science courses, (2) patient assessment skills learned in the laboratory, (3) management of a disease from a health care systems perspective in the pharmacy administration courses, and (4) application of information and skills learned in each year of the curriculum through longitudinal patient care responsibilities in our IPPE program. In traditional didactic courses, students are taught the pathophysiology of the disease, as well as the chemistry, pharmacology, and pharmacokinetics of the drugs. Through a skills laboratory designed to correlate with the basic sciences and pharmacy administration courses, they learn to provide pharmacy-based patient care skills. Students apply knowledge and skills acquired in the classroom to real-life situations throughout our IPPE program. All students are assigned patients in the community to follow during their first three years of the program, visiting these patients on a regular basis to provide pharmacy care. Assessment of all pieces of the curriculum are coordinated by the Office of Teaching, Learning and Assessment (OTLA) through activities such as student focus groups and formal course evaluations. Continuous assessment and improvement of course integration is also conducted through faculty-driven course reviews and curricular mapping.

Service First - Integrating Basic and Clinical Sciences at Harding University College of Pharmacy (HUCOP). Daniel H. Atchley, Harding University, Forrest L. Smith, Harding University, Jeannie M. Smith, Harding University, Ramí A. Beiram, Harding University, Ankita A. Desai, Harding University, Jeffrey B. Mercer, Harding University, Timothy E. Howard, Harding University, Julie A. Hixson-Wallace, Harding University. Objective: Pharmacy students integrate basic and clinical sciences education at a local charitable clinic alongside student nurses and other allied health professionals. Methods:
HUCOP requires students to complete 32 pharmacy service learning hours annually, with at least two experiences in a charitable clinic setting. Christian Health Ministry (CHM), a local all-volunteer charitable clinic, is a coveted location for completing these hours. In addition to working in the pharmacy, students rotate through the clinical laboratory where they are encouraged to connect basic sciences knowledge with clinical science experience. Students perform CLIA-waived tests, including glucose, urinalysis, Beta-HCG, fecal occult blood, PT/INR, urine micro-albumin, and HgbA1c. During this process, laboratory professionals help guide students through the rationale for tests ordered and the pathologies they detect. Lastly, students are encouraged to explore interprofessional ways to improve patient care in the form of joint projects with student nurses. Results: 60/179 (33.5%) HUCOP students have rotated through the CHM laboratory. As a result, one HUCOP student spearheaded an interprofessional diabetes research project yielding data suggesting 59% of patients with type-2 diabetes are not improving their Hgb-A1c results. The data were used to support implementation of a diabetes fitness and nutrition class. Another HUCOP student has been instrumental in establishing protocols and QC/maintenance for the CLIA-waived tests used in the laboratory. Implications: The clinical laboratory experience enables students to integrate their basic and clinical sciences education. This improves their knowledge base and, more importantly, helps improve patient outcomes and the quality of service rendered.

Synchronizing Basic and Clinical Sciences Education in a Lock-Step Curriculum at a New School of Pharmacy. Jill E. Lavigne, St. John Fisher College, Judianne Slish, St. John Fisher College, Angela Nagel, St. John Fisher College, Asim M. Abu-Baker, St. John Fisher College, Anthony T. Corigliano, St. John Fisher College, Lisa Phillips, St. John Fisher College, Brooke E. Lowry, St. John Fisher College, Andrea N. Traina, St. John Fisher College, Amy L. Parkhill, St. John Fisher College, Christine R. Birnie, St. John Fisher College, Marvin C. Pankaskie, St. John Fisher College. Objective: To reinforce student learning by synchronizing topics across courses in pharmacology and therapeutics. Methods: Based on a continuous quality improvement approach (Plan-Do-Check-Act), science and practice faculty have synchronized the curriculum. Data included a review of syllabi, student course evaluations, student focus groups and faculty visits to each others’ classrooms. Results: Organ systems are typically taught at the same time across practice and science courses, and no more than 1 semester apart. For example, endocrine systems are taught in Systems Pharmacology at the same time as endocrine drugs are taught in Pharmacology and Therapeutics during the P3 year. Descriptive assessment data suggest that students are mostly satisfied with the synchronized curriculum. Conclusions: This continuous quality improvement method is on-going. We have acted by hiring a new Assistant Dean of Assessment. Plans include encouraging faculty to attend and lecture in courses outside their discipline. We are piloting (i.e., doing) the integration of Population science didactic coursework with IPPE I, among several examples.

The University of South Florida College of Pharmacy Curricular Model - Innovative, Integrative, and Interprofessional. Erini S. Serag, University of South Florida, Marianne E. Koenig, University of South Florida, Amy H. Schwartz, University of South Florida, Heather M.W. Petrelli, University of South Florida, Yashwant V. Pathak, University of South Florida, Kevin B. Sneed, University of South Florida. Approval for the USF COP occurred after a needs assessment identified tremendous population growth within Tampa Bay, especially amongst “baby boomers.” The USF COP is the only comprehensive public COP within a Florida metropolitan area. The COP resides within USF Health, which encompasses the Colleges of Medicine, Nursing, and Public Health. USF Health embraced the COP, as the discipline fosters further alignment with the Institute of Medicine’s recommendations for promoting an interprofessional academic healthcare environment. The COP mission, vision, and goals are supported by four academic pillars: geriatrics, informatics, leadership, and pharmacogenetics. Each pillar is manifested through an integrated curriculum utilizing faculty from the COP and other USF Health programs. The COP curricular plan supports academic collaboration and evaluation. The COP curriculum includes interdisciplinary and interprofessional components in order to maximize practical relevance and applicability. Syllabi development has been a collaborative effort, with regular meetings to discuss topic, assignment, and evaluation alignment. The Pharmaceutical Skills sequence allows for the continuous reinforcement and application of core professional competencies. Some of the interprofessional workshops within this sequence will occur within the innovative Center for Advanced Medical Learning and Simulation (CAMLs). Longitudinal Introductory and Advanced Pharmacy Practice Experiences further support skill mastery and interprofessional engagement. A two year faculty development program is under development with the USF Health Center for Transformation and Innovation. The FDP will also utilize an interprofessional approach, with faculty being formally assigned mentors from across the USF campus. The FDP curriculum will be tailored to faculty needs.

To Evaluate the Effectiveness of Classroom Connection Assignments in Integrating Pharmaceutical Science and Experiential Education. Frederick Tejada, University of Maryland Eastern Shore, David G. Webster, University of Maryland Eastern Shore, Kathy D. Webster, University of Maryland Eastern Shore. The UMES School of Pharmacy (SOP) curriculum consists of didactic and experiential education components. The didactic component, primarily classroom experiences in the initial two years, is mainly composed of pharmaceutical science modules in the first year. The experiential component begins in the first year with the biweekly Introductory Pharmacy Practice Experiences (IPPEs) and continues throughout the second year. The Advanced Pharmacy Practice Experiences (APPEs) occur in the third year. Effective integration of didactic lectures with experiential practice has been linked to increased student learning and has been successfully implemented using the Learning Bridge process by Pacific University SOP. Similarly, Classroom Connection Assignments (CCAs) are created by and discussed with UMES faculty in the didactic courses to help students incorporate topics discussed in class into the practice experience. Students complete the CCAs during IPPE. Surveys of students, preceptors and faculty were conducted to evaluate the effectiveness of CCAs and compare the results to the Learning Bridge model. Students agreed that CCAs contributed to their understanding and appreciation of the pharmaceutical science modules. Majority of students (>90%) agreed that CCAs promoted critical thinking and self-directed learning skills while only 78% of preceptors thought that CCAs encouraged critical thinking and self-directed learning. Additionally, students preferred case-based CCAs and thought this format represented their best work. Feedback also indicated that CCAs as a tool to facilitate student-preceptor interaction needs improvement. Results obtained were similar to that of Pacific University SOP. Results will be used to improve CCAs at UMES-SOP.

University of the Pacific’s Approach to Integrating Basic and Clinical Pharmacy Education through Curricular Changes. Katerina Venderova, University of the Pacific, Joel Wagner, University of the Pacific, Suzanne M. Galal, University of the Pacific, Oby Stan-Ugbene, University of the Pacific, Sian Carr-Lopez, University of the Pacific, Nancy L. DeGuire, University of the Pacific. A revised
curriculum, launched in 2009, prepares students for their first introductory pharmacy practice experience (IPPE) in semester 2 of an accelerated Doctor of Pharmacy program. This required thoughtful integration of basic sciences into the clinical pharmacy education to better prepare students. To achieve this, faculty from pharmacy practice and medicinal chemistry/pharmaceutics collaborate to coordinate lecture topics and laboratory exercises to facilitate mastery of the basic science and its application to pharmacy practice. Semester 1 courses include non-prescription therapy/self care, pharmacy practice and professionalism, dispensing, compounding/calculations and a practicum course. During dispensing laboratory, students practice filling prescriptions, giving drug consultations, and using pharmaceutics principles to compound dosage forms. The practicum course provides an assessment of each student’s abilities related to dispensing and counseling in a simulated fashion. Sequencing of basic science courses, beginning with cellular and molecular biochemistry, leading to physiology, pathophysiology, pharmacology and medicinal chemistry continues into semester 4. The therapeutics series begins in semester 4, preparing students to perform patient care during the advanced practice experiences. Prior to a therapeutic course, a pre-course assessment helps determine how well students are able to recall and apply basic sciences knowledge and skills. Integrating basic sciences content into therapeutics courses is achieved through team teaching by practice and basic sciences faculty, or incorporating basic science content into the course. While several strategies have been implemented to integrate basic sciences, we have identified a need for further collaboration and communication between basic and practice faculty.

Use of a Backward Design Process to Develop an Integrated, Outcomes-Based Patient Care Course Series. Brenda L. Gleason, St. Louis College of Pharmacy, Tricia M. Berry, St. Louis College of Pharmacy, Andrew J. Crannage, St. Louis College of Pharmacy, Brenda S. Gardenour, St. Louis College of Pharmacy, Chaya Gopalan, St. Louis College of Pharmacy, Gloria Grice, St. Louis College of Pharmacy, Jasna Marjanovic, St. Louis College of Pharmacy, Wendy Duncan, St. Louis College of Pharmacy. Faculty at St. Louis College of Pharmacy are creating an innovative Doctor of Pharmacy curriculum that will develop graduates able to implement evidence-based patient-centered practices. As part of the new curriculum, a group of interdisciplinary faculty from basic and pharmaceutical sciences, pharmacy practice, and uniquely, liberal arts, has developed an integrated, 5-semester, Patient Care course series using an outcomes-based, backward design approach. Utilization of the backward design process for developing our integrated Patient Care course series involved four steps: 1) identifying desired professional responsibilities, ability outcomes, and essential questions with which students will grapple during the course; 2) determining what constitutes acceptable evidence of competency in the course and how competency will be assessed; 3) planning learning strategies and practice opportunities that will allow students to gain competency in desired outcomes; and 4) determining needed pre-requisite knowledge and coursework. Innovative aspects of our modular approach for the integrated course series include: *alignment of didactic coursework, a skills lab, and experiential programs. *incorporation of team-based learning to optimize use of classroom time. *formulation of essential questions for students to deliberately examine the scientific and humanistic foundations of pharmacy practice. *utilization of a bi-directional process to integrate sciences and patient care. *integration of liberal arts throughout to educate the whole student and inspire compassionate practice. Association of American Colleges and Universities (AAC&U) Liberal Education and America’s Promise (LEAP) Outcomes and Valid Assessment of Learning in Undergraduate Education (VALUE) rubrics will be used to assess our curricular approach.

Using a Common Reading Experience to Integrate Basic and Clinical Sciences Education. Frank Romanelli, University of Kentucky, Penni Black, University of Kentucky, Gregory A. Graf, University of Kentucky, Carrie Lifshitz, University of Kentucky, Christina E. Munson, University of Kentucky, Anne Policastro, University of Kentucky, Kelley Ratermann, University of Kentucky. Objective: To provide a common reading experience engaging first year pharmacy students in concepts concerning the intersection of basic science, ethics, and clinical practice. Methods: Incoming pharmacy students at the University of Kentucky were assigned “The Immortal Life of Henrietta Lacks” (HeLa) for summer reading and given a pre-test to assess knowledge of several topics addressed in the book. During professional development week, the class was sub-divided into six discussion groups led by either basic science/practice faculty or a senior student. The facilitators directed each discussion using previously formulated topics including: informed consent, health literacy, healthcare reform, current practice paradigms, role of the pharmacist in healthcare, and research/clinical trials in vulnerable populations. A post-test evaluated student learning. First-year instructors utilized HeLa to assess knowledge of informed consent and to discuss value expectancy theories and two-stage models of health and illness. Results: The pre- and post-test response rate was 95%. The pre-test contained demographic items and questions concerning topics in the book. Approximately 97% of the class self-reported completing the assignment. The post-test demonstrated that the HeLa experience altered the student’s understanding of basic science and clinical concepts. While the common reading experience seemed foreign to students, the majority stated that the HeLa experience should be continued and incorporated into the first-year curriculum. Conclusion: The HeLa experience was embraced by incoming pharmacy students and has provided a foundation for integration of basic and clinical sciences in the classroom, while improving general knowledge in this area.

NEW PHARMACY FACULTY RESEARCH AWARDS PROGRAM

A Strategy to Generate Reactive Intermediates and Incorporate Fluorine using the Mild Release of Trifluoroacetate. David A. Colby, Purdue University. Objectives: To develop a new methodology for the synthesis of fluorine-containing compounds that is fully compatible with complex molecules. Methods: The cleavage of unstable carbon-carbon bonds is a powerful, yet under-explored way to execute synthetic reactions. We will exploit a rare process, the release of trifluoroacetate, to generate reactive intermediates to assemble fluorinated molecules. Results: Our data demonstrate that the fragmentation and release of trifluoroacetate from fluorinated molecules is a mild and efficient way to prepare reactive intermediates to synthesize fluorinated structures. This synthetic strategy provides a high-yielding way to produce difluoroketones and is compatible with many sensitive functional groups. The trifluoroacetate-release strategy is significantly more versatile than existing methods to prepare intermediates such as difluoroenolates. Implications: This synthetic method demonstrates that fluorinated molecules can be readily assembled using an efficient carbon-carbon bond fragmentation process on a highly fluorinated starting material. These experiments will lay the foundation to create fluorinated derivatives of highly complex, biologically active molecules that are not achievable with existing synthetic methods.
Activation of Ral1 and PKC Rescues Polarity Defects in EB1 Knock Down Cells. Joseph M. Schober, Southern Illinois University Edwardsville; Jeanine M. Cain, Southern Illinois University Edwardsville. Objectives: EB1 is required for maintenance of a polarized cell shape and normal cell motility, and EB1 depletion causes hyperfilopodia formation and down regulation of lamellipodia (Schober et al., Cancer Letters 2009). The objective of the current study was to identify the mechanism by which EB1 protein is a positive regulator of cell polarity and lamellipodia protrusion. Method: B16F10 mouse melanoma cells were depleted of EB1 protein using short hair-pin RNA interference. Correlative live cell-immmunofluorescence microscopy was performed to determine localization of WAVE2 and IQGAP1 to protruding versus retracting edges. EB1 knock down cells on laminin were treated with phorbol-12-myristate-13-acetate (PMA) or co-transfected with constitutively active or dominant negative Ral1 mutants. The effect of PKC or Rac1 activation on immunofluorescence localization of WAVE2 and IQGAP1, area of cell spreading, cell shape, and cell motility was assessed. Results: Control cells displayed differential localization of WAVE2 and IQGAP1; WAVE2 concentrated at rapidly protruding edges while IQGAP1 concentrated at retracting edges. EB1 knock down caused poor subcellular separation of WAVE2 and IQGAP1, and caused overall decreased concentration at cell edges. Activation of PKC or Rac1 restored the defects in WAVE2 and IQGAP1 localization, cell spreading and cell shape to levels observed in control cells. Implications: The plus-ends of microtubules target the cell cortex and are thought module actin protrusion dynamics, but little is known of the molecular mechanism that couples this interaction. We propose EB1 protein links microtubules to actin protrusion and cell polarity through signaling pathways involving PKC and Rac1.

An Evaluation of Clinical and Economic Outcomes Associated with a Pharmacist-Coordinated Diabetes Chronic Care Management Program. Carrie McAdam-Marx, The University of Utah; Brandon Jennings, The University of Utah; Morgan Sayler, The University of Utah; Karen Gunning, The University of Utah. Objectives: To evaluate clinical and economic outcomes in University Community Clinic patients with type 2 diabetes (T2DM) who participated in a pharmacist-coordinated, diabetes chronic care management (DCCM) program. Methods: This retrospective analysis was based on University-wide electronic medical record and administrative data from 2008-2010. Patients who participated in DCCM in 2009 or 2010 were compared to a propensity score matched cohort of T2DM patients from 2008-2010. Patients who participated in DCCM in 2009 or 2010 were compared to a propensity score matched cohort of T2DM patients treated by a Community Clinic not supporting DCCM. Patient index date was defined as the DCCM enrollment date or first office visit occurring after 12 months of EMR activity in the observation period (comparison patients). At 6-months post-index, HbA1c goal attainment (<7.0% vs. ≥7.0%) and change from baseline were identified, as were utilization and charges during the post-index period for inpatient admissions, outpatient visits, emergency department admissions, and prescription drugs. Baseline characteristics and outcomes were compared between DCCM and comparison patients using descriptive statistics. Multivariate logistic regression analyses were used to calculate the DCCM propensity score and the likelihood of attaining HbA1c goal. Multivariate regression analyses were used to estimate adjusted changes in HbA1c, healthcare use, and costs. Results: In a preliminary analysis, 122 DCCM patients met study inclusion criteria. The mean (sd) age at enrollment was 57.8 (±13.3) years; 53.3% were female, and baseline HbA1c was 9.8 (±1.9). Full results are pending further analyses. Implications: Data from this study will help to demonstrate the value of clinical pharmacy services in a community clinic-based effort to improve diabetes patient care and outcomes.
study is to enhance pharmacist’s skills and abilities as a health coach through education. **Methods:** The study is a pre- and post-test study design over a 12-month period to evaluate the effects of an educational intervention on medication adherence. Nearly 30 pharmacists were educated through an educational activity on Health Coaching Techniques and nine pharmacists volunteered to participate in this study. Approximately 75 patients have been identified by the pharmacists to coach to better adherence. Patients selected are on at least one chronic medication for high cholesterol, heart disease, hypertension or diabetes and have less than 3 medication fills in the last 120 days. Pharmacists will document basic demographic data as well as the current calculated medication possession ratio (MPR) and an Adherence Estimator® score for each patient. Pharmacists will coach patients for approximately 3 months. Data will be collected to document subsequent medication fills during the study. **Results and Implications:** The results of the pharmacist impact on adherence will be presented at the meeting. Participating pharmacists will also complete a short survey reflecting on their skills and abilities as a health coach gained through the educational activity.

**Comparing a Simulation Based Introductory Pharmacy Practice Experience (IPPE) to Traditional Direct Patient Care IPPEs.**

Deepti Vyas, California Northstate College of Pharmacy, William Ofstad, California Northstate College of Pharmacy, Xiaodong Feng, California Northstate College of Pharmacy. **Objective:** To compare simulation based IPPE students’ practice skills, self perceived clinical skills, and clinical judgment versus those students enrolled in direct patient care IPPEs. A secondary objective is to determine the effectiveness of simulation training as a corrective tool to identify student deficiencies. **Methods:** A randomized controlled trial of IPPE training at a simulated clinical site versus traditional IPPE sites. Thirty students will be enrolled in a simulation based IPPE while 60 students in the control group will be randomized to traditional patient care IPPEs. All students will have completed 200 hours of IPPE at baseline. Pre- and post-quizzes specific to each simulation scenario will be administered to gauge whether students’ knowledge is enhanced. To evaluate long-term retention of knowledge, the quiz will be re-administered after the students’ APPE rotations. A course evaluation and satisfaction survey will be completed. To compare the study arm versus the control group, an objective structured clinical exam (OSCE) will be administered to all students prior to the start of the 2011 Fall semester. The perception of their Preparedness to Perform (PREP) survey will be administered to all students. **Results:** Pending. We expect that simulation IPPE students will perform just as well or better on the OSCE compared to students enrolled in other direct patient care IPPEs. We anticipate positive changes in the PREP survey. **Implications:** This study will immerse students in a “real-life, low-risk” pharmacy practice experience. This project will add to the current literature regarding the utility of simulation in experiential education.

**Contribution of CYP2C19 Genotype and Smoking status on Clopidogrel Responsiveness.** Kathryn M. Momary Mercer University; Spencer B. King St. Joseph’s Translational Research Institute; Laura Kimble Mercer University Georgia Baptist College of Nursing. **Objective:** The specific aim of this study is to determine the incremental contribution of smoking and genetic variation in CYP2C19 on clopidogrel responsiveness. **Methods:** Non-smoking (n=20) and smoking (n=20) subjects receiving dual anti-platelet therapy with clopidogrel and aspirin status post placement of drug eluting stent will be consented and enrolled. These subjects will undergo a single study visit which will include medical record review, patient interview, and collection of blood samples for laboratory analyses. Blood will be collected for CYP2C19 genotyping, platelet aggregation assessment via the VerifyNow system, and quantitative assessment of cotinine levels. A urine sample will also be collected at this visit to verify current smoking status at the study visit. **Results:** Platelet aggregation will be assessed using PRU values. PRU values will be compared between smoking and non-smoking groups with Student’s t-test. PRU values will also be compared between CYP2C19*1/*1 homozygotes, loss of functional and gain of function allele carriers in the entire study population and within each smoking status group using ANOVA. Demographic characteristics will be compared between groups using Student’s t-test for continuous data and a χ² or Fischer’s exact test as appropriate for nominal data. **Conclusion:** Findings of a significant (p<0.05) difference in PRU values between groups would suggest that smoking is associated with clopidogrel responsiveness. In addition, a statistically significant difference in PRU values between genotype groups would suggest that genotype has a differential effect on the role of smoking.

**Engineering lymphocyte- and macrophages- inert Nanoparticles for Lymphatic Drug Delivery.** Qi (Angela) Yang. University of North Carolina at Chapel Hill; Samuel K. Lai. University of North Carolina at Chapel Hill. **Objective:** Most cancers diagnosed at Stage 2B or beyond are typically correlated with poor prognosis, due to poor detection of cancer cells within lymph nodes and inadequate dose of systemic chemotherapeutic drugs that can target the lymph. Conventional nanoparticle drug carriers that enter the lymphatic circulation are trapped by lymph nodes near the site of injection, precluding them from reaching more distal lymph nodes. As a first step towards addressing this challenge, we seek to engineer here synthetic nanoparticles that can evade uptake by both macrophages and lymphocytes. **Methods:** We will covalently coat latex beads of well defined sizes with different MW and surface density of polyethylene glycol (PEG), and characterize these particles using an array of techniques, including dynamic light scattering to quantify particle size, and laser doppler anemometry, and fluorescence assays to quantify the density of PEG coating. We will then quantify particle uptake by cultured macrophages as well as T- and B- lymphocytes via flow cytometry, and correlate our findings to the physicochemical properties of nanoparticles. From this analysis, we seek to identify the physicochemical properties of PEG-coated nanoparticles that enable them to effectively evade uptake by macrophages and lymphocytes. **Results:** Work is currently under way. **Implications:** Engineering particles that remain inert to macrophages and lymphocytes while preferentially binding to cancer cells may markedly improve the diagnosis and therapy of cancer that has spread to the lymph.

**Impact of Ethnicity on Platelet Function and Response to Aspirin and Clopidogrel.** Julie H. Oestreicher, University of Nebraska Medical Center; Lyle G. Best, Turtle Mountain Community College; Paul P. Dobesh, University of Nebraska Medical Center. **Objectives:** Targeting platelets with clopidogrel and aspirin is crucial for preventing atherothrombotic events associated with vascular disease and cardiac surgery. Patient responses to clopidogrel and aspirin, however, are extremely variable, and negative outcomes have been attributed to differences in drug effectiveness. Although the mechanisms of variability are controversial, recent evidence suggests heritable differences may be one important factor. Importantly, recent landmark clinical trials of P2Y12 receptor antagonists have primarily evaluated Caucasians and Asians with low representation of other groups such as American Indians and African Americans, even though these groups have high rates of cardiovascular disease. Thus, the purpose of this research is to evaluate platelet reactivity and response to antiplatelet
medications in minority communities. **Methods:** The effects of ethnicity on platelet function and response to antiplatelet agents will be assessed in American Indians using healthy people (n=50) and coronary artery disease patients treated with aspirin and clopidogrel (n=50). All subjects will submit a saliva sample for CYP2C19 genetic testing, and all patients taking aspirin and clopidogrel will be tested for platelet reactivity using the VerifyNow P2Y12 assay. **Results:** Pending Implications: This research study will be the first to evaluate platelet reactivity and response to antiplatelet medications in American Indians. In addition, the frequency of CYP2C19 gene variants will be established in this population for the first time. These experiments will provide novel information regarding the influence of ethnicity on platelet reactivity and contribute to improved treatment for health disparity communities.

**Impact of a Pharmacist-Managed Diabetes Clinic to Improve Glycemic and Cardiovascular Care.** Bijal M. Shah, Touro University California; Eric J. Ip, Touro University California; James Chan, Touro University California; Junhua Yu, Touro University California. To determine if a pharmacist-managed diabetes clinic in a primary care setting will improve hemoglobin A1C (A1C), LDL cholesterol levels (LDL-C), and blood pressure (BP) measurements in type 2 diabetes (T2DM) patients over a one-year period compared to baseline. Patients with T2DM who were older than 18 years and had at least one encounter with a clinical pharmacist at Kaiser Permanente Mountain View Clinics were included. Via collaborative agreement with the primary care team, the clinical pharmacist had the ability to initiate and adjust medications, order appropriate laboratory work, and provide diabetes education. Patients with type 1 diabetes, A1C < 7% at baseline, and patients who discontinued Kaiser Permanente health insurance during the study time frame were excluded. Electronic medical records from the period of June 2007 to February 2010 were reviewed and the following data were collected: age, sex, ethnicity, smoking status, height, weight, duration of diabetes, number of encounters (in clinic or via phone follow-up), lab values (A1C, LDL-C, BP at baseline, 3, 6 and 12 months), co-morbid conditions, and list of medications. Comorbidities were assessed using the Charlson comorbidity index. Data were analyzed using SPSS vs. 14. A total of 203 patients from the pharmacist-managed clinic met the criteria for inclusion in the study. The mean age was 56.7 years, 60% were male, and 48% were non-Hispanic Whites. The mean BMI was 33.1 kg/m² and the patients had a history of T2DM for 6 years on average. Mean A1C values decreased from 9.9% at baseline to 7.3% at 6 months and to 7.1% at 12 months (p<0.001). Mean LDL-C values decreased from 109 mg/dL at baseline to 86 mg/dL at 6 months and to 81 mg/dL at 12 months (p<0.001). Mean systolic BP values decreased from 131 mmHg at baseline to 129 mmHg at 12 months (NS). Mean diastolic BP values decreased from 73 mmHg at baseline to 71 mmHg at 12 months (p<0.04). A pharmacist-managed diabetes clinic in a primary care setting decreased A1C and LDL cholesterol values significantly. The change in BP was marginal. Pharmacists can be a valuable member of the primary care team for the management and care of patients with T2DM.

**Information Literacy Skills of First Year Pharmacy Students:** **Focus Group Results.** Jennifer R. Martin, The University of Arizona; Sandra S. Kramer, The University of Arizona; Marion K. Slack, The University of Arizona. **Objective:** To assess the information literacy skills of incoming first year pharmacy students using focus groups. The findings from the focus group will be used to develop a tool for assessing information literacy skills of all entering students. **Methods:** Two focus group sessions were held with a total of fourteen student volunteers in the second semester of their first professional year. A series of nine open-ended questions were given with follow-up probing questions. Each session was fifty-five minutes and was held during lunch. Both sessions were audio recorded for accuracy, transcribed, and analyzed. **Results:** These students had skill levels ranging from low to high. The typical search strategy was first using Wikipedia, then PubMed and then MD Consult. Students indicated they did not use physical resources, but relied on electronic resources. If an article was not available electronically, they would not retrieve it. They also had trouble understanding the difference between types of databases and how to search them and would often rely on Google. **Implications:** Insights provided by the students will allow both the librarians and the instructors to make adjustments in their instruction of information seeking skills and will help in creating a survey tool for incoming first year students prior to starting fall courses to determine their information literacy skills. Being able to address deficiencies and strengths in their skills through effective instruction will benefit future students in their competency skills as they enter rotations and ultimately professional practice.

**Localizing Ligand Specificity Determinants in Purine Nucleoside Transporters.** Cassandra S. Arendt, Pacific University Oregon. **Objective:** Equilibrative nucleoside transporters (ENTs) are important for endogenous nucleotide metabolism and uptake of purine analog drugs. Little is known about how ENTs discriminate between potential ligands, though a few residues have been identified in previous mutagenesis studies. The proposed research aims to identify regions within two adenosine-transporting ENTs from the protozoan Crithidia fasciculata that are involved in ligand specificity. **Methods:** CNT1 and CFAT1 are adenosine transporters that are highly similar in amino acid sequence and biochemically distinguishable: CFAT1 is specific for adenosine only, while CNT1 adenosine transport can be inhibited by inosine. Chimeras between the two genes will be constructed and expressed in a protozoan cell line that lacks any endogenous purine nucleoside transport. The resulting cell lines will be assayed for affinity and specificity for [3H]-adenosine. Chimeras that give rise to a switch in biochemical activity from CFAT1-like to CNT1-like will be characterized in more detail. Mutant genes that further dissect regions of interest will be constructed and characterized as time permits. **Results:** This study is ongoing. Preliminary results will be presented at the meeting. **Implications:** Since most of the 66 amino acid sequence differences between CFAT1 and CNT1 lie outside of regions that have previously been implicated in ENT ligand affinity and specificity, this work should highlight new areas of interest. The proposed project will provide valuable structure/function data for those interested in ENT proteins and the design of drugs transported by them.

**pH Modulated Polymeric Micelles for Antiangiogenic Treatment of Ovarian Cancer.** Deepa A. Rao, Pacific University Oregon; Adam W.G. Alani, Oregon State University. **Objectives:** to evaluate physicochemical properties of novel pH modulated paclitaxel (PTX) micelles and assess their antiangiogenic activity in *in vitro* model. Recent studies have shown that PTX has anti-angiogenic activity which can be optimized by formulation and/or dosing schedule. We have designed and synthesized new PTX delivery system based on novel polymeric micellar nanocarriers. PTX was attached to poly(ethylene glycol)-block-poly(aspartate-hydrazide) with a pH-labile hydrazide bond. The release of PTX is pH dependent and based on the stability of the hydrazone bond in neutral environment while undergoing hydrolysis in acidic conditions to release the free drug. **Methods:** Micelles were formed by solvent casting method. Drug loading and stability of these micelles was determined by reverse
Towards Anti-Cancer Therapeutics: Antagonism of the Bak–Bcl-xL Complex by Synthetic α-Helix Mimetics of Varying Backbone Curvatures. Jeremy L. Yap, University of Maryland; Xiaobao Cao, Scott & White Memorial Hospital; KennoVanommeslaeghe, University of Maryland; Alexander D. MacKerell, University of Maryland; W. Roy Smyth, Scott & White Memorial Hospital; Steven Fletcher, University of Maryland.

Objectives: To evaluate the effect of backbone curvature of a range of Bak-BH3 domain synthetic α-helix mimetics on the antagonism of the Bak–Bcl-xL complex, and to identify potent inhibitors of Bcl-xL. Bak is a pro-apoptotic (cell-killing) protein whereas Bcl-xL is an anti-apoptotic (cell-surviving) protein. Several cancer cell lines demonstrate over-expressed levels of Bcl-xL. Thus, mimicry of the Bak-BH3 α-helical domain is an attractive goal in anti-cancer chemotherapy, since these mimetics are proposed to sequester Bcl-xL and re-activate apoptosis (cell death).

Method: Synthetic, oligoamide α-helix mimetics were prepared in which curvature-inducing pyridine subunits of an all-pyridine, tetrameric oligoamide lead were stepwise replaced with benzenes to afford more linear oligomers. In vitro assays were conducted using a previously reported fluorescence polarization assay. Whole cell viability assays were performed with three cancer cell lines that over-express Bcl-xL.

Results: Trimeric, oligoamide α-helix mimetics reduced whole cell viabilities of cultured mesothelioma (I45), non-small cell lung (H1299) and colon (DLD) cancer cell lines with double to single digit micromolar IC_{50} values. Significantly, pyridine-to-benzene subunit substitutions, and the location of such, had a notable impact on potency.

Implications: Backbone curvature of a series of α-helix mimetics of the Bak-BH3 helix appears to have an effect on the resulting antagonism of the Bak-Bcl-xL complex. More broadly, these data suggest future structure-activity relationship (SAR) studies of synthetic α-helix mimetics developed to antagonize other medically-important protein–protein interactions should also investigate backbone curvature, as well as the usual side chain functionalities.

EXCELLENCE IN ASSESSMENT - WINNER

Faculty attitudes, experiences, and outcomes pre/post implementation of a formalized peer observation and evaluation program. Margarita V. DiVall, Northeastern University; Judith T. Barr, Northeastern University; Michael Gonyeau, Northeastern University; S. James Matthews, Northeastern University; Jenny Van Amburg, Northeastern University. Objectives: 1) Assess pre/post faculty attitudes of the Peer Observation and Evaluation (POE) process in the Pharmacy Practice department; 2) Determine the degree of adherence to POE policies and procedures; 3) Determine types of feedback received; 4) Determine its impact on faculty teaching. Methods: Two faculty surveys were administered via SurveyMonkey. Pre-implementation survey collected needs assessment and attitudes regarding POE. After 2 years requiring yearly POE participation, faculty completed a second survey asking similar questions to the first one, plus questions regarding adherence to POE policies and procedures, type of feedback received, and its impact on teaching.

Results: The post implementation survey was completed by 76% of department’s faculty (32 distinct observations). Overall, 91% of the faculty had at least 1 lecture peer evaluated in the 2 year period. Faculty attitudes towards peer evaluation either stayed the same or improved post implementation (comparing post and pre-surveys). Adherence to three of the four steps of the process was high (100%, 100%, and 94% for steps 1 through 3 respectively); however, the post-student assessment discussion step, occurred only 47% of the time. All faculty reported receiving a balance of positive and constructive feedback; 78% agreed that POE gave them concrete suggestions for improving their teaching and 71% incorporated the reflection on peer evaluation in their yearly performance evaluation submission. Finally, 89% felt that overall, the benefits of POE outweigh the effort of participating in the process. Conclusions: Faculty mostly adhered to the POE policy and procedures and found peer feedback beneficial.

INNOVATIONS IN TEACHING AWARD - WINNER

Illness Performed and Imagined: An Elective Course. Ruth E. Nemire, Fairleigh Dickinson University; Russell Teagarden, Touro College of Pharmacy-New York; Michelle Assa-Eley, Touro College of Pharmacy-New York. The humanities are often regarded in biomedicine as extraneous to the educational process for those who will be providing patient care. The humanities, however, provide important insights to pharmacy students about the illness experience. They provide a view of the broader impact medications and treatment may have on people and how lives are lived as a result. These insights can explain myths and inaccuracies patients operate under, and can reveal the sad truths of illness. These insights also draw attention to the perceptions and reflections of patients and others touched by biomedicine. It is important that student pharmacists be engaged in learning about patients and how their lives are affected by illness and health care systems. An elective course in the medical humanities was created to enable students to learn how health care is interpreted and portrayed across several different humanities genres, including literature, art, film, and drama. This three-credit course was first offered to 22 students in the winter semester of 2010 at Touro College of Pharmacy. Students voiced a gain in understanding how patients ought to be treated and involved in their health care. Students created art, poetry, and pictography that demonstrated their newfound knowledge and empathy for patients. Faculty members learned that students were eager to read, watch, and interpret the genres used in the course to improve their ability to understand patients and their predicament.